obstetric trauma surgery
art and science

postpartum hypotonic bladder
postpartum urine retention with overflow incontinence

kees waaldijk
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nigeria
obstetric trauma surgery
art and science

setting standards by evidence-based practice

postpartum hypotonic bladder

postpartum urine retention with overflow incontinence

based on

some 1,400 patients with hypotonic bladder
out of
26,500 obstetric fistula/trauma reconstructive procedures

the one and only risk factor of the obstetric fistula

poor obstetric care due to a failed system

all the rest is political blah blah blah rhetoric
deliberate lies and fake information

kees waaldijk
obstetric trauma surgery
art and science

series of textbooks each with a specific topic
setting evidence-based standards

this series has been developed for setting evidence-based standards in the training and management of the obstetric trauma in all its forms in the low-, in the middle- as well as in the high-income world.

the name of the series has been changed from obstetric fistula into obstetric trauma surgery since the fistula is only one aspect of the complex obstetric trauma.

though a systematic approach is being followed this seems to be a utopia since the material is too extensive and it would take too long.

each time a specific topic has been finalized it will be published as a separate entity; with later on an update if needed.

then somewhere along the line a comprehensive summary will be produced in order to have a representative overview.

the emphasis is placed on the functional anatomy of the pelvis, pelvis floor and pelvis organs, the female urine and stool continence mechanisms, the mechanism of action and the principles of reconstructive and septic surgery.

for training reasons it will follow a step-by-step approach and repetition; together with schematic drawings and photographs.

the whole series is based on Kees archives of obstetric trauma with so far 26,500 reconstructive and conservative procedures in 22,500 patients with a rare “complete” documentation of each procedure and results as to healing and continence by electronic reports with 150 parameters, over 100,000 pre/intra/postoperative digital photographs and a comprehensive database as personal experience over a 35-year period from 1984 up till now.

as such it is considered to be a full scientific evidence-based report; though it has not followed the “you peer me, i peer you” doctrine.

it is also not following the strict protocol of the international scientific journals or the so-called established theories; since only dead fish follow the flow of the river; and strict protocols kill any creativity; the message is not in the format.

since it is the life work of the author it is written in his own words and in his own style.

writing things down helps the author in organizing his own understanding and ideas.
the obstetric trauma keeps on fascinating the author who feels privileged to be part of the management and clinical research in the highly variable destructive trauma to the functional pelvis anatomy

the postpartum hypotonic bladder as seen and managed by the author is something else from what has been described in the literature

where is has been labeled as postpartum urine retention if no spontaneous micturition occurs within 6 hours after childbirth with residual urine volumes of 250 ml; especially when using regional anesthesia during childbirth

the suggested cause is neurogenic: interfering with the detrusor innervation

it seems we are dealing with a different type of postpartum hypotonic bladder since the women present at the earliest 3 days up to over 2 years post partum with different signs and findings whilst regional anesthesia is not being used

in its initial full-blown stage there is a suprapubic mass, the anterior vagina wall is really bulging into the vagina and the bladder is overdistended (increased longitudinal bladder diameter up to 25-30 cm) with high urine bladder volume of 750-2,500 ml; with overflow urine incontinence

with in the healing phase transition into postpartum genuine urine incontinence which may heal spontaneously or result in lasting intrinsic urine incontinence

though it may not heal at all and becomes long standing for years

the suggested cause is mechanic obstruction of the urethra with mechanic trauma/breaking of detrusor smooth muscle fibers due to severe overstretching since the fetal head blocks the urethra during labor

though there may also be a neurogenic component due to sacral plexus trauma

detrusor muscle biopsy would be of great help though out of bounce for the author

the recovery depends on physiologic healing processes but little is known of mechanic smooth muscle trauma healing

out of the series obstetric trauma surgery; art and science this textbook outlines an evidence-based concept and approach

to demonstrate the enormous variety of the obstetric trauma

kees waaldijk  md phd

february 2020
pelvis anatomy
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introduction

postpartum urine incontinence
due to
obstetric trauma with(out) anatomic tissue loss

there are many causes/forms of postpartum involuntary urine loss; so the first priority is to identify the cause of the urine incontinence

and the second is to promote spontaneous healing by indwelling bladder catheter or if that is not successful by meticulous repair of the defects

obstetric urine fistulas

these are all due to pressure necrosis and combined with necrotic anatomic tissue loss and classified into kees I, kees IIAa, kees IIBb, kees IIAb, kees IIBa and kees III fistulas

each type has its own specific surgical principles

postpartum genuine intrinsic incontinence

as due to median defects within the endopelvic diaphragm or an overstretched loose endopelvic diaphragm so that the support of the posterior bladder/uv-junction/urethra is insufficient and these structures will rotate backward from the symphysis with funneling of proximal/mid or whole urethra and decrease in outflow resistance (equivalent to 4th power of radius of urethra diameter)

spontaneous healing is possible but the following is better
immediate catheter treatment for 4 weeks may promote spontaneous healing followed by pelvis floor exercises; if no cure obtained the responsible longitudinal median defect within the endopelvic diaphragm has to be repaired

postpartum hypotonic bladder

probably due to mechanic breakage/trauma of the smooth muscle fibers of the detrusor muscle due to severe overstretching/filling of the bladder during delivery since urethra blocked by the infant head

spontaneous healing is possible via genuine intrinsic incontinence or intermittent self-catheterization; however, the bladder remains full or is filling up again after each self-catheterization interfering with the physiologic healing processes

the following makes more sense
immediate bladder catheter for 4-6 weeks with complete decompression of the bladder at all times in order for the smooth muscle fibers to heal
uv-stricture with overflow incontinence and dysuria

this may be due to scarring after subfistula trauma; and since it may be the cause or the sequel a minute fistula has to be excluded by a dye test

and needs (repeat) gradual dilatation with indwelling catheter for 2 weeks and high oral fluid intake

if no cure obtained a surgical revision of the uv-junction is needed with excision of all scar tissue and re-anastomosis of bladder neck to proximal urethra or buccal mucosa plasty

neurologic incontinence

this is theoretically possible though difficult to diagnose and seems infrequent

obstetric fistulas combined with stress/urge incontinence

especially after fistula repair with minute/small residual fistulas, visible and nonvisible at direct inspection, whereby the scarring functions like ectopic pacemaker and prevents physiologic functioning of the continence mechanism and a dye test is necessary to demonstrate or exclude the fistula and a frequent finding as combined with ureter fistulas type III; either since this (scarring/proximal urine loss) functions as ectopic pacemaker or due to traction on the endopelvic diaphragm by the scarring

once the fistula has healed or the ureter has been successfully re-implanted, normally the incontinence will heal as well

postrepair incontinence

the major problem of obstetric fistula surgery and classified as post kees I, post kees II Aa, post kees II Ab, post kees II Ba and post kees II Bb incontinence

postrepair postdelivery incontinence

in patients who had a successful repair with full continence and who started to leak again without a fistula following a subsequent delivery

within the first 2 months after delivery the patients may benefit from indwelling catheter for 2-4 weeks and high oral fluid intake; however, most of them will not be cured

after a new or residual fistula has been excluded by a dye test incontinence surgery will be necessary whereby an effort has to be made to identify and then repair all the responsible defects within the endopelvic diaphragm and its suspension from/insertion into the pelvis wall
hypotonic bladder
essentials postpartum hypotonic bladder

introduction
there seem to be three types/causes of postpartum hypotonic bladder
1 neurogenic trauma interfering with innervation of detrusor muscle
2 mechanic trauma to smooth muscle fibers of detrusor muscle
3 combination neurogenic/mechanic trauma
this essay deals only with the mechanic postpartum hypotonic bladder

mechanism of action
mechanic trauma to the smooth muscle fibers due to severe overstretching/overdistension of the detrusor muscle due to mechanic urethra block by fetal head during second stage of labor; so the bladder fills up and up and up ballooning

forms of mechanic hypotonic bladder
there are three forms
a hypotonic bladder without visible anterior vagina wall trauma
b hypotonic bladder with necrotic or healed anterior vagina wall trauma
c hypotonic bladder with obstetric urine fistula

symptoms
depending upon healing stage
involuntary more or less continuous urine loss which starts the same day or the day(s) after childbirth with inability/insufficiency of spontaneous miction: overflow incontinence
during the healing phase there may be continuous involuntary urine loss exacerbated by stress: combination of overflow with stress incontinence
during the last stage of spontaneous healing there may be only involuntary urine loss on stress: stress incontinence

characteristics
depending upon healing stage
initially
aa suprapubic mass up to umbilicus though masked in severe obesity
bb anterior vagina wall bulging into vagina
cc bladder overdistended with increased longitudinal diameter up to 25-30 cm
dd intravesical urine volume from 750 up to > 2,500 ml
ee vesicalization of proximal urethra urethra length < 2 cm
later on, all these signs improve over time and
may become normal if total spontaneous healing takes place
will be at the upper limit of normal if incomplete healing takes place
will not become normal if no healing takes place
additionally anterior vagina wall trauma or even an obstetric fistula is possible

treatment principles
 uninterrupted continuous bladder decompression
by indwelling bladder catheter for 4-6 weeks + high oral fluid intake
normal versus hypotonic bladder
postpartum hypotonic bladder
mechanic cause

introduction

the postpartum hypotonic bladder is a form of postpartum urine retention with overflow urine incontinence

it is rather common since the author encountered already 1,400 women with symptoms and signs of it; in all its different stages

the literature is scarce probably since there is good chance of spontaneous healing at first sight

at second sight however, during the healing phase it may become and will be diagnosed as genuine urine incontinence since there is no longer urine retention

there seem to be two different forms and theoretically three:

a neurogenic as caused by neurogenic trauma interfering with detrusor innervation; in environments with good obstetric care

defined by no spontaneous miction within 6 hours after childbirth with residual urine volume of 150-250 ml; especially after regional anesthesia during childbirth

the author is not familiar with this form since he is not dealing with obstetrics, only with the outcome of the obstetric trauma

b mechanic as caused by trauma to the smooth muscle fibers due to severe overstretching of the detrusor muscle during labor; in environments with poor obstetric care

defined by involuntary urine loss due to overflow incontinence after childbirth; where regional anesthesia during childbirth is not being practiced

this is where the experience of the author comes in

c combination neurogenic/mechanic either right from the beginning or later on when the neurogenic type is not treated adequately so the bladder gets overstretched; then over time the neurogenic component may/will heal but the damage to the smooth muscle fibers may still be present so in the end it is mechanic

the author may have treated this type as well

testing the anal reflex may give some information about pudendal neve trauma at sacral plexus or during its course

detrusor smooth muscle biopsy and then repeated during the healing phase will give the ultimate answer but this falls out of the scope of the author
postpartum hypotonic bladder
mechanic cause
the mechanic postpartum hypotonic bladder comes in 3 varieties

postpartum hypotonic bladder
without visible anterior vagina wall trauma

postpartum hypotonic bladder
with visible necrotic or healed anterior vagina wall trauma

postpartum hypotonic bladder
with obstetric urine fistula

symptoms
involuntary more or less continuous urine loss which starts the same day or the day(s) after childbirth with inability/insufficiency of spontaneous miction:
overflow incontinence
during the healing phase there may be continuous involuntary urine loss exacerbated by stress: combination of overflow with stress incontinence
during the last stage of spontaneous healing there may be only involuntary urine loss on stress: stress incontinence

characteristics/signs
depending upon the different stages during spontaneous healing
in its initial full-blown phase:

aa suprapubic mass up to umbilicus though masked in severe obesity
bb anterior vagina wall bulging into vagina
cc bladder overdistended with increased longitudinal diameter up to 25-30 cm
dd intravesical urine volume from 750 up to >2,500 ml
ee vesicalization of proximal urethra urethra length <2 cm

later on, all these signs improve over time and
may become normal if total spontaneous healing takes place
will be at the upper limit of normal if incomplete healing takes place
will not become normal if no healing takes place

additionally anterior vagina wall trauma or even an obstetric fistula is possible
mechanism of action see next chapter

when the fetal head is blocking the urethra during labor and this is not relieved in time the bladder fills up and fills up and up to such an extent that the smooth muscle fibers of the detrusor muscle will be traumatized

then the detrusor muscle is no longer able to contract sufficiently for spontaneous micturition with emptying of the bladder

however, there is continuous urine production and via the ureters it enters the bladder so there is no decompression and the detrusor muscle will stay in a continuous state of overstretching

with overflow urine incontinence since

first the intravesical pressure will increase due to overfilling

second the outflow resistance is diminished due to the following three intrinsic causes: a urethra shortening, b vesicalization of proximal urethra and c downward displacement of endopelvic diaphragm with loss of support

theoretically there may be a neurogenic component

or if the neurogenic postpartum hypotonic bladder is not handled adequately the bladder may fill up and up with overstretching of the detrusor muscle resulting into mechanic trauma to its fibers

nb in addition to the hypotonic bladder
the impacted fetal heal may cause necrotic tissue loss of the anterior vagina wall with all the signs of the hypotonic bladder and

if not relieved in time may lead to an obstetric urine fistula with all the signs of the post partum hypotonic bladder

enormous variety
as with all obstetric trauma lesions there is an enormous variety especially since there is a tendency to spontaneous healing from its initial full-blown stage to completely normal via all the healing stages

wide pubic arch $\geq 90^\circ$
there is a frequent combination with a wide pubic arch which is not surprising since the wider the pubic arch the better the fetal head fits into it with compression of the urethra

spontaneous healing
spontaneous healing may be the rule via transitional genuine incontinence though the healing may be incomplete as permanent genuine incontinence or the smooth muscle fibers heal incompletely or not at all as long-standing hypotonic bladder
repeat postpartum hypotonic bladder

repeat postpartum hypotonic bladder is possible after complete healing, and the author encountered, documented and treated 2nd, 3rd, 4th and even 5th repeat postpartum hypotonic bladder

though their previous hypotonic bladder in all had healed completely, theoretically it is possible that they still had some minor residual smooth muscle trauma

treatment principles

indwelling catheter treatment for at least 4 weeks in order to create total continuous bladder decompression so the smooth muscle fibers can heal without further filling up of the bladder and so without further disturbance of the healing processes

prognosis
good

the prognosis as to healing with normal miction and full continence is good by catheter treatment for at least 4 weeks

if the transitional genuine incontinence in the healing phase did not heal spontaneously a continence operation was performed with good success

discussion

this is the first time the mechanic postpartum hypotonic bladder is being described as due to mechanic trauma to the smooth muscle fibers due to severe overstretching of the detrusor muscle

since the urethra is mechanically blocked against the posterior symphysis during labor by the fetal head which makes spontaneous micturition impossible

it is rather common with a tendency to spontaneous healing via different healing stages like transitional genuine incontinence

it is different from the neurogenic postpartum hypotonic bladder as seen and described in the high-income world; especially after regional anesthesia during childbirth

it comes in three varieties depending upon the severity and duration of soft tissue compression between the fetal head and the posterior symphysis

hypotonic bladder without visible trauma to avw, hypotonic bladder with visible necrotic or healed avw trauma and hypotonic bladder with an obstetric urine fistula

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repeat postpartum hypotonic bladder is possible after complete healing, and the author encountered, documented and treated 2nd, 3rd, 4th and even 5th repeat postpartum hypotonic bladder though their previous hypotonic bladder in all had healed completely, theoretically it is possible that they still had some minor residual smooth muscle trauma treatment principles see special chapter indwelling catheter treatment for at least 4 weeks in order to create total continuous bladder decompression so the smooth muscle fibers can heal without further filling up of the bladder and so without further disturbance of the healing processes prognosis good the prognosis as to healing with normal miction and full continence is good by catheter treatment for at least 4 weeks if the transitional genuine incontinence in the healing phase did not heal spontaneously a continence operation was performed with good success
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longitudinal bladder diameter
**mechanism of action**
mechanic hypotonic bladder

in order to manage the postpartum hypotonic bladder optimally one has to understand the mechanism of action

**mechanism of action**
mechanic blocking of urethra

during the second stage of labor the fetal head is compressing the soft tissue against the bony pelvis wall

when the fetal head is blocking the urethra during labor and this is not relieved in time the bladder fills up and fills up and up (ballooning) to such an extent that the following may occur

  a. the smooth muscle fibers of the detrusor muscle will be traumatized by mechanic force due to severe overdistension
  
  b. opening up of trigonal ring/uv junction with vesicalization of proximal urethra due to ballooning effect
  
  c. downward pressure upon endopelvic diaphragm whereby its fibers may split in the midline

then the detrusor muscle is no longer able to contract sufficiently or not at all in order to execute spontaneous micturition with emptying of the bladder

however, there is continuous urine production and via the ureters it enters the already overfilled bladder so there is no decompression and the detrusor muscle will stay in a continuous state of overstretching

with overflow urine incontinence since first the intravesical pressure will increase due to overfilling

second the outflow resistance is diminished due to the following:

  a. vesicallization of proximal urethra with urethra shortening and
  
  b. downward displacement of endopelvic diaphragm with loss of support

theoretically there may be a neurogenic component

or if the neurogenic postpartum hypotonic bladder is not handled adequately the bladder may fill up and up and up with overstretching of the detrusor muscle resulting in mechanic trauma to its fibers
mechanism of action

in order to manage the postpartum hypotonic bladder optimally one has to understand

mechanism of action

mechanic blocking of urethra
during the second stage of labor the fetal head is compressing the soft tissue against

the bony pelvis wall

when the fetal head is blocking the urethra during labor and this is not relieved in time

the bladder fills up and up and up (ballooning) to such an extent that the following

may occur

aa

the smooth muscle fibers of the detrusor muscle will be traumatized by mechanic

force due to severe overdistension

bb

opening up of trigonal ring/uv junction with vesicalization of proximal urethra due to

ballooning effect

c

downward pressure upon endopelvic diaphragm whereby its fibers may split in the

midline

then the detrusor muscle is no longer able to contract sufficiently or not at all in order to

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however, there is continuous urine production and via the ureters it enters the already

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downward displacement of endopelvic diaphragm with loss of support

theoretically there may be a neurogenic component

or if the neurogenic postpartum hypotonic bladder is not handled adequately the bladder

may fill up and up and up with overstretching of the detrusor muscle resulting in

mechanic trauma to its fibers

nb in addition to the mechanic hypotonic bladder

however, it is not only the urethra which is blocked but all the soft tissue in between the

fetal head and the posterior symphysis are being compressed which may result into

postpartum hypotonic bladder

without visible anterior vagina wall trauma

postpartum hypotonic bladder

with visible necrotic or healed anterior vagina wall trauma

postpartum hypotonic bladder

with obstetric urine fistula

wide pubic arch ≥ 90%

there is a frequent combination with a wide pubic arch of ≥ 90° simply since the wider

the pubic arch the better the fetal head fits into it

compressing the soft tissues against the posterior symphysis

thought it is also found in combination with a narrow pubic arch due to molding of the

fetal head and then compression

intermediate and long-standing trauma if nothing is done

though complete spontaneous healing may be the rule there are three conditions which

may develop with their own mechanism of action

transitional genuine urine incontinence see mechanism of healing

in the healing phase which may heal completely

persistent genuine urine incontinence see mechanism of healing

if the transitional incontinence does not heal completely

persistent long-standing hypotonic bladder see mechanism of healing

if the smooth muscle fibers do not heal completely or not at all

transitional genuine urine incontinence

in the healing phase which may heal completely

theoretically there may be a neurogenic component

or if the neurogenic postpartum hypotonic bladder is not handled adequately the bladder

may fill up and up and up with overstretching of the detrusor muscle resulting in

mechanic trauma to its fibers

nb in addition to the mechanic hypotonic bladder

however, it is not only the urethra which is blocked but all the soft tissue in between the

fetal head and the posterior symphysis are being compressed which may result into
mechanism of healing
mechanic hypotonic bladder

since the author is not involved in obstetrics the obstetric trauma women are presenting themselves days, months or years after the index delivery

this means at different stages during the spontaneous healing process with all the signs and symptoms of that specific stage

based upon the symptoms and the signs and the evidence-based follow-up and the consequent documentation

the author presents his personal evidence-based experience of the healing process

mechanism of action
during healing process

there are three things to be considered which have to heal and makes it complicated

aa  detrusor muscle
bb  anatomic continence mechanism
cc  support by endopelvic diaphragm

first, the smooth muscle fibers start to heal whilst the detrusor muscle in total is still too weak resulting in overflow incontinence combined with stress incontinence since the bladder is still overfilled this will hamper re-urethralization of the vesicalized proximal urethra and also healing of any defect within the endopelvic diaphragm

second, when the detrusor muscle becomes stronger there will be spontaneous miction with incomplete bladder emptying resulting in stress incontinence since now the healing process of reurethralization can start together with healing of any defect within the endopelvic diaphragm

third, when the detrusor muscle has recovered its full strength there will be spontaneous miction with complete bladder emptying; however, still with stress incontinence until the intrinsic forces of the anatomic continence mechanism have become strong enough with normalization of outflow resistance

fourth, if and when the detrusor muscle has healed “completely” together with the anatomic continence mechanism there will be full continence with spontaneous miction

this process is fluid and may take 3-4 months or longer depending upon the severity of the original trauma with during the process

transitional genuine incontinence

or it may stop at any stage resulting into

permanent genuine incontinence
or even
long-lasting hypotonic bladder
transitional genuine incontinence

**aa** the smooth muscle fibers are healing sufficiently or have healed completely so that the detrusor muscle is strong enough to execute spontaneous miction with (in)complete emptying of the bladder

**bb** the UV-junction is still open with vesicalization of the proximal urethra and urethra shortening; since there is no longer ballooning the healing process of re-urethralization may have or has already started but is not completed

**cc** the eventual median defect of the endopelvic diaphragm may have started or has already started to heal but it is not completed with still insufficient support

the healing is hindered by the intermittent filling up of the bladder with stretching of the detrusor smooth muscle fibers

so uninterrupted decompression by indwelling catheter may speed up the healing

persistent genuine incontinence

the healing of the transitional genuine incontinence stops and will remain incomplete

**aa** the smooth muscle fibers have healed sufficiently/completely so that the detrusor muscle can execute spontaneous miction, however,

**bb** re-urethralization stays incomplete with diminished outflow resistance

**cc** the endopelvic diaphragm has not healed sufficiently for good support

an incontinence operation is needed, if no cure by conservative treatment

long-lasting hypotonic bladder

the healing process stops far too early and remains incomplete due to the fact that the bladder remains continuously overstretched so the fibers cannot heal

**aa** incomplete healing of the smooth muscle fibers whereby the detrusor muscle cannot execute sufficient action: weak and incomplete emptying of the bladder

**bb** no re-urethralization of proximal vesicalized urethra

**cc** no healing of the endopelvic diaphragm

long and/or repeat uninterrupted indwelling catheter with high oral fluid intake is needed

the spontaneous healing processes are speeded up/completed by continuous indwelling bladder catheter + high oral fluid intake
transitional genuine urine incontinence
healing phase hypotonic bladder

during the fluid healing process of the hypotonic bladder there will be a concurrent fluid improvement in symptoms and signs

once the continuous involuntary urine leaking stops there will be a period of transitional genuine urine incontinence until complete recovery

this has to be taken into account by the obstetric trauma surgeon

or if no complete recovery takes place it will result into permanent stress incontinence

this should also be considered by the obstetric trauma surgeon in dealing with genuine urine incontinence

characteristics

during the postpartum period up to 3 months after childbirth the woman presents with the following complaints

from more or less continuous involuntary urine loss to only urine loss during cough or heavy lifting

with on examination from heavy to slight stress incontinence

with all or some signs of hypotonic bladder as described

indicating genuine urine incontinence as healing phase of hypotonic bladder

the severity depends on the severity of the original trauma and how far the healing has progressed

mechanism of action
during healing process

there are three things to be considered which have to heal and makes it complicated

aa detrusor muscle
bb anatomic continence mechanism
cc support by endopelvic diaphragm

the healing process is fluid with different symptoms and signs at each healing stage
transitional genuine urine incontinence during the fluid healing process of the hypotonic bladder there will be a concurrent fluid improvement in symptoms and signs once the continuous involuntary urine leaking stops there will be a period of transitional genuine urine incontinence until complete recovery this has to be taken into account by the obstetric trauma surgeon or if no complete recovery takes place it will result into permanent stress incontinence this should also be considered by the obstetric trauma surgeon in dealing with genuine urine incontinence characteristics
during the postpartum period up to 3 months after childbirth the woman presents with the following complaints from more or less continuous involuntary urine loss to only urine loss during cough or heavy lifting with on examination from heavy to slight stress incontinence with all or some signs of hypotonic bladder as described indicating genuine urine incontinence as healing phase of hypotonic bladder the severity depends on the severity of the original trauma and how far the healing has progressed

mechanism of action
during healing process there are three things to be considered which have to heal and makes it complicated:

- **aa** the smooth muscle fibers are healing sufficiently or have healed completely so that the detrusor muscle is strong enough to execute spontaneous miction with (in)complete emptying of the bladder
- **bb** the uv-junction is still open with vesicalization of the proximal urethra and urethra shortening; since there is no longer ballooning the healing process of re-urethralization may have or has already started but is not completed
- **cc** the eventual median defect of the endopelvic diaphragm may have started or has already started to heal but it is not completed with still insufficient support whereby gradually the symptoms and signs will improve and “normalize” though still visible and measurable

1 suprapubic mass will disappear

2 overstretching of the bladder will disappear and the longitudinal bladder diameter will improve though even if completely healed it still will be in the upper range of normal to minimally increased between 12 and 15 cm

3 the avw bulging will improve but still slightly or more visible

4 there will be (in)complete re-urethralization with increase in urethra length and with an increase in outflow resistance

5 the median defect within the endopelvic diaphragm may become less or even heal with improvement of support

treatment principles see special chapter
decompress the bladder for sufficiently long time in order not to disturb but promote the natural healing processes

development into permanent genuine urine incontinence this is a new unique entity within the enormous variety of the obstetric trauma to the functional female pelvis anatomy and may be combined with other lesions due to obstetric trauma causing incontinence

discussion this is the first time mention is made of and an extensive description is given of genuine urine stress incontinence during the healing phase of the hypotonic bladder with its own characteristics, its own mechanism of action, its own mechanism of healing and its own treatment principles
before/after draining urine
treatment principles
hypotonic bladder, transitional incontinence etc
excellent evidence-based final healing rate

since little is known about the treatment of physical smooth muscle fiber trauma the aim is to promote and certainly not to disturb the natural healing process

which means surgery is out of question and we have to concentrate on

relaxation smooth muscle fibers by decompression of bladder
for
sufficiently long uninterrupted time
by
indwelling bladder catheter + high oral fluid intake

though different management strategies have been suggested and practiced for the neurogenic hypotonic bladder in the high-income world; however, the author could not find robust evidence-based date in large number of patients

the author thinks these principles are definitely not in line with the mechanism of trauma in the mechanic hypotonic bladder in the low(er)-income world

and would like to present his personal evidence-based principles and practice in over 1,400 women as personally managed by himself and all parameters fully documented

hypotonic bladder
management after consent
uninterrupted indwelling bladder catheter for 4-6 weeks
high oral fluid intake

001 full also vaginal examination of all lesions due to obstetric trauma
002 documentation of all relevant data
003 informing the woman on the procedure, duration of treatment, high oral fluid intake, personal hygiene etc
004 consent of the woman
005 insertion calibrated metal sound until it touches bladder dome wall for euo/bw in cm
006 insertion foley catheter ch 18
007 drain the bladder completely and measure urine volume in ml
008 remove foley catheter and measure euo/b in cm
reinsert foley catheter

the author prefers open draining into pot

high oral fluid intake of 4,000 to 6,000 ml per 24 hours in order to prevent ascending infection

duration of catheterization at least 4-6 weeks for uninterrupted bladder decompression

instructions not to block catheter

regular check if catheter is functioning

if blocked, flush or insert new foley catheter

no antibiotics unless bacterial infection like puerperal sepsis, pneumonia leaking umbrella, multiresistance

immediate mobilization prevention of lower leg contractures, promoting general health

any other measure to promote general/specific health

follow-up after catheter removal

instruct woman on continuing high oral fluid intake and frequent micturition every 15-30 min

questionable rationale for pelvis floor muscle exercises see special chapter

check following day for spontaneous miction and stress incontinence

check after one week; determine residual urine volume

check once a month or every two months up to 6 months

if there are any problems take adequate measures according to common sense

hypotonic bladder with necrotic avw/"fistula" trauma management

do not use probe to see if there is a real fistula in order not to make iatrogenic one, especially with a thin probe

exactly the same management whereby the necrosis will heal or become fistula
hypotonic bladder with obstetric urine fistula
management
first fistula repair according to the principles for that specific kees type
with indwelling catheter treatment for at least 4-6 weeks

transitional genuine incontinence
management
the same as for hypotonic bladder for 4 weeks

persistent genuine incontinence
management
incontinence surgery according to the guidelines for genuine urine incontinence

persistent long-standing hypotonic bladder
management
the same as for hypotonic bladder but for 8-12 weeks
refrain from surgery

comments about other treatment principles/practice
the practice used to be to reassure the woman that urine loss after childbirth was more
or less normal and that it would heal over time and do nothing
that has changed with the pelvis floor physiotherapy see special chapter
there are other treatment principles/practice as based on consensus and strict protocols
but the author could not find evidence-based proof in large numbers
short-term catheter for 1 or 2 days
to decompress the bladder initially
followed by
sterile or clean regular self-catheterization until ok
however, the decompression is too short to have any impact in the mechanic type, and
then the bladder starts filling up again interfering with the healing process
if one notices how the women are handling their catheters there is low chance one can
achieve sterile or clean intermittent self-catheterization in the low(er)-income world
classic hypotonic bladder
day 15
kano
cath 424
classic atonic bladder
zhka (kano city) female 15 yr 07.07.96
diagnosis: PI, overflow incontinence due to atonic bladder (no spontaneous miction), leaking urine for 15 days that started 4 days following obstructed labor for 1 day, in hospital live male, married 1 yr ago post(menarche 6 mth earlier), not living with husband, no menstruation, no (h/o) drop foot, no rvf; borderline pubic arch 150.0 cm
07/07-96 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 21 cm), moderate elevation after draining 1500 ml urine, euo/b 2 cm, mild avw trauma increased bladder capacity (longitudinal diameter 21-2 = 19 cm, atonic bladder) suprapubic mass/uterine sound/urine documented 07.07.96!
21.07 + 19.08.96 not leaking at all cath removed bladder drill
26.08.96 urine retention/fever/headache/vomiting again atonic bladder? ch 18
16.09 + 23.09.96 not leaking at all cath removed bladder drill
21.10.96 not leaking at all, no incontinence, normal miction insp/ heaved, good elevation, no stress incontinence
11.11.96 idem
20.01.97 not leaking at all, no incontinence, normal miction healed, no stress

hypotonic bladder
general discussion
postpartum hypotonic bladder

though the postpartum hypotonic bladder is a rather common phenomenon its literature is scarce and superficial whilst only the neurogenic type is mentioned

probably because there is a tendency to spontaneous healing

and the practice used to be to reassure the woman that urine loss after childbirth was more or less normal and that it would heal over time and do nothing

that practice changed with the pelvis floor physiotherapy practice boom whereby the obstetricians transferred their responsibility to the physiotherapist; without performing their own research into this fascinating subject

this is the first time an essay is being written about the mechanic postpartum hypotonic bladder with symptoms, characteristics, mechanism of action, treatment, fluid healing stages and outcome

as based on the examination and management of over 1,400 women with postpartum hypotonic bladder in all its forms and healing stages

and backed up by full documentation of all relevant data, treatment and evidence-based results in chronologic order without leaving a single one out for whatever reason

since the soft tissues of the anterior vagina wall are compressed between the fetal head and the posterior symphysis the postpartum hypotonic bladder may be accompanied by necrotic or healed avw trauma or even an obstetric fistula

it demonstrates the enormous variety of the obstetric trauma the importance of which is not fully understood and needs extensive research

first we need repeat biopsy of the detrusor muscle to establish the histologic damage of the smooth muscle fibers and then to study the healing processes

the author could not find anything about mechanic smooth muscle trauma and/or its healing processes

also the detrusor muscle biopsy would confirm or deny the mechanic nature and extent

the fluid spontaneous healing processes take time depending upon the extent of the original trauma; up to 3-4 months for recovery to 2 years for complete healing

continuous uninterrupted decompression by indwelling catheter is recommended and to the author makes more sense than regular intermittent self-catheterization (re-filling)

nb since the transitional genuine urine incontinence may result into persistent genuine urine incontinence, this may influence our insight into genuine urine incontinence
the first encounter the author had with postpartum hypotonic bladder was in december 1986 in a 29-yr-old para vi (1 alive) who presented with total overflow incontinence and traumatized anterior vagina wall over bladder neck/base

at that time he was still a novice in the noble art of obstetric trauma surgery but had started already with his immediate catheter management

since everything has been (fully) documented right from the very beginning he is able to give the evidence-based chronology of his insight and management of the postpartum hypotonic bladder

1986 first hypotonic bladder treatment by the author though he had never seen one in his life before by inserting foley ch 16 catheter for 4 weeks by which the woman healed completely

1992 start with measuring longitudinal bladder diameter in cm as indication of bladder capacity as routine in all our obstetric trauma surgery including the obstetric fistula, genuine urine incontinence and uterus/cervix prolapse as objective parameter from this we were able to give an impression of the bladder capacity as

- small ≤ 3 cm
- moderate > 3 to < 5 cm
- normal > 5 to ≤ 12 cm
- transitional > 12 to < 15 cm
- increased ≥ 15 cm

1994 start with measuring pubic arch in degrees as indication of bony pelvis capacity as routine in all our obstetric trauma surgery as objective parameter this turned out to give a wealth of information and improved our insight into the obstetric trauma and pathophysiologic mechanisms

the postpartum hypotonic bladder was the incentive to start testing the anal reflex since there was a need to include or exclude the neurogenic component

1999 start with testing anal reflex in order to get information about pudendal nerve trauma, at first only in postpartum hypotonic bladder

2002 start testing anal reflex as routine in all our conservative and surgical management of the obstetric trauma; this gave a wealth of information

though there was an increase in (also documentation of) the parameters right from the beginning, from 1999 onwards there is full documentation of all the parameters

for completion of insight (repeat) biopsy of the detrusor smooth muscle is needed
basic science

see textbook functional female pelvis anatomy

pelvis floor muscle exercises

corpus intrapelvinum

endopelvic diaphragm
pelvis floor muscle exercises

only of value in minor forms of urine incontinence

introduction
empirically, pelvis floor (levator ani + perineum) muscle exercises may have a positive effect upon urine intrinsic stress incontinence

however, though it is recommended everywhere by everybody the author could not find an explicit explanation for this action

functional anatomy
the pubococcygeus muscles envelop the vagina three-quarterly bilateroposteriorly as a sling being in direct contact with the bilateral vagina walls and in indirect contact (via anorectum) with the posterior vagina wall

the open anterior/cephalad one quarter gap is filled up by the symphysis and endopelvic diaphragm/pubocervical musculofascia with adherent anterior vagina wall and adherent posterior bladder base, posterior uv-junction and posterior urethra whilst

all the continence mechanisms are firmly anchored into the perineum outlet diaphragm

mechanism of action
when the pubococcygeus muscles contract they squeeze the posterior and bilateral vagina walls with the effect that the anterior vagina wall (not squeezed) moves anteriorly and cephalad together with the adherent endopelvic diaphragm/pubocervical musculofascia with adherent posterior bladder neck, posterior uv-junction and posterior urethra wall

this will reinforce the intrinsic urine continence mechanism since the posterior urethra wall will rotate forward towards the anterior urethra wall and symphysis resulting in a better arrangement/architecture of the anatomic urine continence mechanism; so a positive effect but indirectly

the simultaneous contraction of the muscles with increase in the tonus of the perineum outlet diaphragm will directly have a positive effect on all the continence mechanisms since these are firmly anchored into it

and probably increase in the tonus of the endopelvic diaphragm by smooth muscle fiber contraction by reflex action

at the same time there will be an increase in the extrinsic rhabdosphincter forces by voluntary and/or reflex contractions

however, there is no guarantee of success since it will only be successful if

now by this action the total amount of forces closing the urethra will be higher than the intravesical excretion pressure
optimal way of using pelvis floor muscles
one first contracts the pelvis floor muscles before standing up or before coughing so that
the configuration of the anatomic urine mechanism is optimal just before there is an
increase in (intraabdominal and so in) intravesical pressure
if one does this regularly first their action will become stronger and second our able
brain will create special pathways for it and it may become a reflex

small or no effect with increasing endopelvic diaphragm defects
however, if there are defects within the endopelvic diaphragm or its anterobilateral/
circumferential fixation to the pelvis wall with poor or nil support of the continence
mechanism the action of the levator ani muscles will have only small or no effect since
there will be insufficient or no reduction of the posterior urethra wall

discussion
it is good to realize that the pelvis floor functions as one dynamic unit with an indirect
action by the levator ani muscles and a direct action by the perineum outlet diaphragm
upon the urine continence mechanism
whereby the action of the levator ani muscles is reinforced by the simultaneous action of
the perineum outlet diaphragm and the other way round since
they are firmly connected to each other via the perineal body, the external sphincter ani
complex and the levator plate
with perineal body as centrum tendineum perinei since all the relevant structures are
firmly anchored into it

cautions
it is only in mild forms of intrinsic stress incontinence that the pelvis floor exercises may
have a beneficial effect for a short time
however, there are no randomized controlled studies available claiming a long time
beneficial effect
the function of the levator ani muscles in preventing and treating intrinsic stress incon
tinence as main support of the urine continence mechanism are highly overvalued
and another concept of securing/stabilizing the pelvis organs and their continence
mechanisms is needed as
corpus intrapelvinum with endopelvic diaphragm

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lam contraction

reactive fascia/epd movement
anterior/cephalad
corpus intrapelvinum

multifunctional connective tissue body of pelvis

as archaic matrix

introduction

the whole complex of intrapelvic connective tissue is called the corpus intrapelvinum or connective tissue body of pelvis; as 3-dimensional matrix for the pelvis organs with their arterial blood supply, venous drainage, lymphatic drainage and innervation

it is also called endopelvic fascia or fascia endopelvina (conjugans), however, its main component consists of smooth muscle tissue/fibers; so the term fascia is misleading

though its basic anatomic structure and functions are easy to understand it is difficult to comprehend and visualize its exact anatomic extent with highly specialized functions according to the different physiologic needs

especially since there are no clear demarcations which make it difficult to demonstrate this body/organ with different structures by dissection and/or indirect imaging

however, it is only by studying its full anatomic extent and understanding its functions that progress will be made in reconstructive pelvis surgery

since weakness and defects in this important corpus intrapelvinum are responsible for the development of genuine intrinsic incontinence, urogenital prolapse, enterocele and rectocele

the amount of literature is enormous with confusing and contradicting terminology and various complicated theories

however, the anatomy and functional anatomy do not change and the author would like to give an outline as based on existing anatomic textbooks, especially

lehrbuch der topographischen anatomie as written by anton hafferl as second edition from 1957

by analyzing the topographic position in relation to the urinary and genital tract the paramount role of the levator ani muscles in these theories seems to be overvalued and highly questionable

the author thinks another concept is needed with regard to the functional anatomic urine (in)continence mechanism and pelvis organ anatomic position and prolapse

therefore he would like to introduce the concept of the endopelvic diaphragm as part of the corpus intrapelvinum as first line for counteracting the intraabdominal hydrostatic and compression pressure, as support of the urine continence mechanism and for securing the pelvis organs in their variable anatomic position; see next chapter
basics of serous membranes

the body cavities are enclosed by bones and muscles covering the bones and muscles bridging the gaps in between the bones

the **fascia interna** is the total fascia inner lining of the cavity

the **serosa** (peritoneum, pleura) is connected to this fascia by

the **tela subserosa**

depending upon the width in between the fascia and the serosa the tela subserosa may develop from minimal with its basic loose archaic texture to extensive with a cohesive mixture of collagen, elastin and smooth muscle tissue as connective tissue body/organ in a loose, dense or condensed form

the intracavity organs are embedded into the tela subserosa together with their blood supply, venous drainage, lymphatic drainage and innervation; whilst the tela subserosa also connects/suspends the organs to the cavity wall and each other

abdominopelvic cavity

the total fascia inner lining of the abdominopelvic cavity is called fascia abdominis interna; the serosa is called parietal peritoneum; the connective-tissue layer connecting the fascia abdominis interna to the parietal peritoneum is called the tela subserosa

the width between the internal fascia and peritoneum is small at the upper anterior abdominal wall from the umbilicus upwards and at the thoracoabdominal diaphragm and the fascia interna may “fuse” with the parietal peritoneum

however, the distance between the parietal peritoneum and posterior abdominal wall, anterior lower abdominal wall and pelvis wall becomes wider and wider resulting into extensive development of the tela subserosa as tela urogenitalis

pelvis cavity

the total fascia inner lining of the pelvis cavity is part of the fascia abdominis interna; and here it is called

the **fascia pelvis parietalis**

the **serosa** is called peritoneum parietale

the **tela urogenitalis** is that part of the tela subserosa which is filling up the large gap between the fascia pelvis parietalis and peritoneum parietale

the intrapelvic organs are embedded into the tela urogenitalis together with their arterial blood supply, venous drainage, lymphatic drainage and innervation; whilst the tela urogenitalis also connects/suspends the organs to the pelvis wall and each other
from the tela subserosa urogenitalis 3 structures develop

fascia visceralis

encapsulating the organs and ensheathing the blood/lymphatic vessels and nerves

corpus intrapelvinum

cohesive mixture of collagen, elastin and smooth muscle tissue/fibers in a loose, dense or condensed form; its main component is dynamic smooth muscle tissue/fibers

loose connective tissue

filling up the spaces not occupied by the corpus intrapelvinum

fascia visceralis

as part of the tela urogenitalis which encapsulates the organs and then is named after the organ like fascia visceralis vesicae = visceral bladder fascia; and which as well ensheaths the blood and lymphatic vessels and the nerves

the space in between the fascia visceralis and the organ wall is filled up by loose connective tissue allowing the organs like the bladder to expand and deflate rapidly by filling and emptying within a short time span

when the organ does not expand and deflate rapidly like the uterus which grows slowly during pregnancy the fascia visceralis “fuses” with the organ wall and grows slowly together with the uterus; after emptying by childbirth it involutes slowly together with the uterus during the puerperium

corpus intrapelvinum = connective tissue organ of pelvis

as part of the tela urogenitalis; it constitutes a multifunctional connective tissue organ/ body and consists of a cohesive mixture of collagen, elastin and smooth muscle tissue/ fibers in loose, dense or condensed form according to whatever is needed

collagen for strength, elastin for passive elasticity and plasticity and smooth muscle fibers for active dynamic tonus and relaxation as coordinated by intrinsic myogenic impulses and extrinsic impulses by the autonomic nervous system

the smooth muscle component is the main component; even if some parts of it are called fascia or ligament it is still prevalent

its extensive 3-dimensional mesh-like structure ensures a seamless combination of static and dynamic functions

as a whole together with components of the organ walls as embedded into it, the corpus intrapelvinum is the major force in resisting hydrostatic and compression intraabdominal pressure due to its non-fatigue tonus which can be increased by reflex action and as such contributes to compression pressure

the pelvis floor with its large hernia-prone openings is secondary in taking care of the rest pressure

it also protects the organs with their supply from physiologic trauma during walking, sexual intercourse and childbirth
the specialized parts of it are called fasciae, septa, ligaments, plicae which all together form the corpus intrapelvinum each with a specialized function for the organs with their supply and then combined for the whole biomechanicophysiology of the pelvis cavity

it has to be considered as one multifunctional organ where the basic archaic texture has developed into individual specialized structures according to the physiologic needs

the space between one organ and another or between an organ and the adjacent cavity wall is called a spatium filled up by connective tissue in a condensed form as septum/fascia or in a loose form or in a loose form with a thin fluid film

it embeds the organs and their arterial blood supply, venous drainage, lymphatic drainage and innervation; and stabilizes and secures the organs in their variable anatomic position depending upon the degree of filling of the organ itself or filling of the adjacent organ(s); in whatever body position

it suspends/connects the intrapelvic organs to the pelvis wall with so called pillars for arterial blood supply, venous drainage, lymphatic drainage and innervation

it is responsible for the blood flow inside the valve-less intrapelvic veins towards the vena cava inferior

it allows the organs to expand rapidly by filling and deflate rapidly by emptying

it allows the organs to move smoothly and independently from or simultaneously with each other

depending upon the physiologic needs it condenses to dense fascia plates or septa in between the organs and ligaments from the organs to the (bi)lateral pelvis wall and also loose structures like plicae; since the ligaments are smooth muscle tissue they are called muscles as well

though it is one continuous 3-dimensional mesh-like body/organ it is subdivided into overlapping para-structures

paracystium
that part of corpus intrapelvinum into which the bladder is embedded with condensation as bladder pillar at posterior bladder base cephalad to the ischium spine containing the blood and lymphatic vessels and nerves, and the pelvic ureter; connecting/suspending the bladder to the pelvis wall

parametrium
that part of corpus intrapelvinum which embeds the uterus/cervix, tubes and ovaries with condensation as uterovaginal pillar at uterus isthmus in the frontal plane thru and cephalad to the ischium spine containing the blood and lymphatic vessels and nerves and the pelvic ureter; connecting/suspending these organs to the pelvis wall

paracolpium
that part of corpus intrapelvinum which embeds the vagina with condensation as utero vaginal pillar in the frontal plane thru and in the region of the ischium spine containing the blood and lymphatic vessels and nerves; connecting/suspending the vagina to the pelvis wall
the specialized parts of it are called fasciae, septa, ligaments, plicae which all together form the corpus intrapelvinum each with a specialized function for the organs with their supply and then combined for the whole biomechanicophysiology of the pelvis cavity. It has to be considered as one multifunctional organ where the basic archaic texture has developed into individual specialized structures according to the physiologic needs. The space between one organ and another or between an organ and the adjacent cavity wall is called a spatium filled up by connective tissue in a condensed form as septum/fascia or in a loose form or in a loose form with a thin fluid film. It embeds the organs and their arterial blood supply, venous drainage, lymphatic drainage and innervation; and stabilizes and secures the organs in their variable anatomic position depending upon the degree of filling of the organ itself or filling of the adjacent organ(s); in whatever body position. It suspends/connects the intrapelvic organs to the pelvis wall with so called pillars for arterial blood supply, venous drainage, lymphatic drainage and innervation. It is responsible for the blood flow inside the valve-less intrapelvic veins towards the vena cava inferior. It allows the organs to expand rapidly by filling and deflate rapidly by emptying. It allows the organs to move smoothly and independently from or simultaneously with each other depending upon the physiologic needs it condenses to dense fascia plates or septa in between the organs and ligaments from the organs to the (bi)lateral pelvis wall and also loose structures like plicae; since the ligaments are smooth muscle tissue they are called muscles as well. Though it is one continuous 3-dimensional mesh-like body/organ it is subdivided into overlapping para-structures.

paraproctium
That part of corpus intrapelvinum which embeds the rectum with condensation as rectum pillar caudad to the ischium spine containing the blood and lymphatic vessels and nerves; connecting/suspending the rectum to the pelvis wall.

And into the condensed parts in between the organs like septum; these are not separate parts but fit into the corpus intrapelvinum as part of the fascia between the organs like pubocervical musculofascia.

septum vesicocervicale
In between posterior bladder and anterior cervix as vesicocervical fascia.

septum vesicovaginale
In between posterior bladder and anterior vagina wall as pubocervical musculofascia.

septum rectovaginale
In between anterior rectum and posterior vagina wall and is fixed to centrum tendineum perinei (perineal body) as rectovaginal fascia.

The space between the septa and the visceral fascia of the organs is filled up by loose connective tissue allowing friction free movement of the organ wall against the septum; ideally this is the layer or space of interest for surgeons in bloodless dissection.

spatium prevesicale
Between bladder and symphysis in continuity bilaterally with

spatium paravesicale
Between bladder and (bi)lateral pelvis wall
All filled up by loose connective tissue and thin adhesive fluid film allowing the bladder wall to slide against the pelvis wall and anterior abdominal wall without coming loose.

spatium vesicocervicale
Between bladder and cervix.

spatium vesicovaginale
Between bladder and vagina.

spatium rectovaginale
Between vagina and rectum and up to perineal body.

spatium pararectale
(Bi)laterally between rectum and pelvis wall in connection with

spatium retrorectale
Between rectum and sacrum continues cephalad into the spatium retroperitoneale.

It reacts to hormones and reconfigures and strengthens under physiologic stress.
and is subdivided into other specialized condensed structures for further stabilizing the organs and connecting them to the pelvis wall like

**arcus tendineus fasciae = atf**
as line of fusion bilaterally from posterior pubis bone body 0.5-1 cm from midline pubis symphysis to ischium spine; as anterolateral attachment of the endopelvic diaphragm to the pelvis wall
it is connected to the obturator fascia and to the arcus tendineus of levator ani muscle via a narrow triangular fascia sheath
inclination of 25-30° as to horizontal from anterior to posterior in upright position

**pubocervical musculofascia = vesicovaginal musculofascia**
in between the posterior bladder wall and anterior vagina wall as part of the **endopelvic diaphragm**; see special chapter **endopelvic diaphragm**

**arcus tendineus of rectovaginal fascia = atrf**
as line of fusion from the lateral side of perineal body over levator ani fascia to ischium spine and fuses with the posterior part of the arcus tendineus fasciae

**rectovaginal musculofascia = prerectal fascia**
in between the posterior vagina wall and anterior rectum wall and fixed anteriorly to the perineal body, (bi)laterally to arcus tendineus of the rectovaginal fascia and posteriorly to the cervix and the sacrouterine ligaments

**vesicoumbilical fascia**
in between bilateral vesicoumbilical ligaments from bladder to umbilicus

**medial vesicoumbilical ligament**
obliterated urachus
from median bladder to umbilicus
restricting the upward movement of the bladder

**(bi)lateral vesicoumbilical ligaments**
obliterated umbilical arteries
from bilateral internal iliac artery to umbilicus
restricting the upward and sideward movement of the bladder

**pubovesical ligaments = pubovesical muscles**
condensation of pubocervical musculofascia
stabilizing the posterior bladder neck

**posterior pubourethral ligaments = pubourethral muscles**
condensation of pubocervical musculofascia as anterior attachment to pubis bones
stabilizing the posterior proximal/mid urethra wall

**broad ligament = parametrium**
from lateral uterus to pelvis wall comprising

**round ligament (muscle)**
smooth muscle structure from anterolateral uterus horn thru inguinal canal and radiating into labium majus and mons pubis
stabilizing uterus in anteflexion/version
infundibulopelvic ligaments = suspensory ligament of ovary
from ovary to pelvis wall
suspends ovary

ligamentum ovarií proprium = proper ovary ligament
from ovary to lateral uterus
connects ovary to uterus

cardinal ligaments
from ilium/ischium bones to (bi)lateral cervix in a frontal plane cephalad to the ischium spines
suspending/connecting the cervix and endopelvic diaphragm bilaterally to the pelvis wall

sacrouterine ligaments = rectouterinus muscles
from cervix to rectum and sacrum
attached to (ischio)coccygeus fascia and piriformis fascia via fascia sheath

endopelvic diaphragm
one highly specialized structure within the corpus intrapelvinum as a whole constitutes a
dynamic functional endopelvic diaphragm; see next chapter

loose connective tissue
as part of the tela urogenitalis in a loose archaic form filling up the spaces not occupied
by the corpus intrapelvinum; these spaces are of interest to the surgeon for a bloodless
dissection

this allows friction-free movement/sliding of the organ wall against the structures of the
corpus intrapelvinum without becoming loose from each other

and together with a thin adhesive fluid film it allows the bladder wall to slide against the
anterior abdominal wall and anterior and lateral pelvis wall without becoming loose

and ensuring that the anterior urethra wall is always adherent to the posterior symphysis
and as such does not rotate; not even if the posterior urethra wall rotates backwards
away from the posterior symphysis due to defective connective tissue support and then
resulting into progressive funneling or vesicalization of the urethra starting proximally

innervation
the corpus intrapelvinum is controlled and coordinated by intrinsic myogenic impulses
via baro- and stretch receptors as modulated by extrinsic impulses from the autonomic
(sympathetic, parasympathetic ?and also enteric?) nervous system via a complex reflex
mechanism and from hormones and from other neurotransmitters

since its main component is smooth muscle tissue/fibers the corpus intrapelvinum forms
a highly dynamic body/organ due to its non-fatigue tonus and has the ability to react by
hypertrophy and hyperplasia for increased strength; and also by involution
discussion

how to describe an important 3-dimensional mesh-like collagen, elastin and smooth muscle connective tissue organ without clear demarcations in its full anatomic extent and full dynamic multi-functionality as

a combination of a synchronized multi-unit smooth muscle archaic matrix with single-unit smooth muscle specialized structures with tonic action for non-fatigue tonus and immediate superimposed reactive phasic action upon stretch

with a stop anteriorly at the umbilicus and continuous with the tela subserosa of the retroperitoneal space posteriorly cephalad since both belong to the tela subserosa of the whole abdominopelvic cavity

as based on findings during his obstetric trauma surgery and evidence based results it became clear that another concept was needed; as one major function of the corpus intrapelvinum

the problem is that since there are no clear demarcations between this body and the organs except for the visceral organ fascia and between the different structures of the corpus intrapelvinum like a fluidum it is difficult to demonstrate it as a whole and/or demonstrate its different structures by surgical dissection and/or indirect imaging

however, once one starts looking for this dynamic corpus and its different structures as a surgeon one will find it and its structures and then starts realizing its paramount importance for the functional pelvis anatomy

though the different structures have their own specific function their actual strength is that their function will be reinforced by the simultaneous function of the whole corpus intrapelvinum as one dynamic biomechanicophysiologic unit

embedding the organs and their arterial blood supply, venous drainage, lymphatic drainage and innervation and being

responsible for the independent physiologic functioning of the organs, for stabilizing/securing the organs in their variable anatomic position, for suspending/connecting the organs to the pelvis wall and to each other, for protecting the organs and their supply against physiologic trauma during walking, sexual intercourse and childbirth and for supporting the continence mechanisms of the urinary, genital and digestive tract

genuine intrinsic urine incontinence, urogenital prolapse like cystocele and uterus/cervix prolapse, intraperitoneal content prolapse like enterocoele and digestive prolapse like rectocele are all due to localized defects in the endopelvic diaphragm of the corpus intrapelvinum; in isolated form or combined

though the author believes strongly in this concept, time and evidence-based results and challenges by other reconstructive surgeons will tell if he is right or wrong

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endopelvic diaphragm

in the female

with cervix as its central point

introduction

the intrapelvic organ and organ support situation in the female differs radically from the situation in the male by the interposition of the large female genital tract in between the distal urinary tract anteriorly and the distal digestive tract posteriorly

each embedded into the corpus intrapelvinum of the tela urogenitalis, together with their vascular and nervous supply

though the situation of the superior layer of pelvis floor is more or less the same since the levator ani muscles are not affected; except for a wider pelvis

the perineum outlet diaphragm is severely weakened by the large vagina opening; so instead of two now a third and large opening has been pierced thru punched out

so the pelvis floor in the female is prone to dysfunctioning

there is increased hydrostatic intraabdominal pressure due to the weight of the female genital organs; especially during pregnancy

also the support of the anatomic female urine continence mechanism changed since in the male it is well supported by the prostate

as compensation in order to support the female bladder and urethra and the uterus and cervix and to withstand the intraabdominal pressure the corpus intrapelvinum formed a functional dynamic structure as the author would like to call the endopelvic diaphragm

from the pubis bone bodies anteriorly to the sacrum posteriorly and circumferentially connected to the pelvis wall like the skin of a drum or trampoline with the cervix as its center; and fusing anteriorly with the perineum outlet diaphragm under an angle of 35-40°

in between the distal urinary tract, the proximal genital tract, the intraperitoneal contents and the distal digestive tract and the vagina

with a small opening anteriorly for the urethra and a larger one posteriorly for the rectum

since the cervix is firmly anchored into the central pierced thru punched out opening it becomes the centrum tendineum intrapelvinum as well; since all the musculofascia structures are firmly anchored onto it
it consists of a mixture of connective tissue for strength, elastin for passive elasticity and plasticity and smooth muscle fibers for active dynamic non-fatigue tonus and relaxation via baro- and stretch receptors as modulated by the autonomic nervous system

it is the first line of counteracting the hydrostatic intraabdominal pressure and contributes to compression pressure by increase or decrease of its tonus; especially since its main component is smooth muscle fibers

whilst the rest pressure is dealt with by the pelvis floor structures, especially by the perineum outlet diaphragm

it supports the posterior urethra, posterior uv-junction and posterior bladder neck in their anatomic position and as such contributes to the anatomic urine continence mechanism

it prevents the posterior urethra, posterior bladder, cervix, intraperitoneal contents and anterior rectum from herniating into the vagina

it is divided into specialized parts as the pubovesical/posterior pubourethral ligaments, pubocervical musculofascia, arcus tendineus fasciae, cardinal and broad ligaments, rectovaginal fascia and sacrouterine ligaments with the cervix as centrum tendineum intrapelvinum since all its musculofascia/ligament structures are firmly connected to it

**pubovesical/posterior pubourethral ligaments (= muscles)**

anchoring the most anterior part of the pubocervical musculofascia as part of the endopelvic diaphragm onto the pubis bone bodies and

securing the posterior proximal urethra, uv-junction and bladder neck in their anatomic position and so supporting the female urine continence mechanism

once they become defective intrinsic stress incontinence may develop

**pubocervical musculofascia**

like a triangle from the pubis bone bodies and bilateral atf to the cervix as the anterior part of the endopelvic diaphragm as part of the corpus intrapelvinum

this thick musculofascia is well developed and seems to consist of longitudinal smooth muscle/collagen fibers (from anterior towards posterior) and underneath the mid/distal urethra also transverse smooth muscle/collagen fibers (in between the median inferior surfaces of the pubis bones) interwoven by collagen and elastin

the longitudinal arrangement seems likely since longitudinal median defects are found intraoperatively at genuine incontinence, cystocele and cervix prolapse surgery

the anterior transverse arrangement seems likely since the median longitudinal defects stop at 1.5-2 cm to the external urethra opening where the endopelvic diaphragm fuses with the perineum outlet diaphragm

the intact pubocervical musculofascia secures and stabilizes the (posterior) bladder base/neck, uv-junction and urethra in their anatomic position and as such supports the female urine continence mechanism; it also stabilizes the cervix anteriorly and bilaterally

the intact pubocervical musculofascia prevents the pre/subperitoneal contents bladder base/uv-junction/urethra and the cervix from herniating into the vagina
the axis of the pubocervical musculofascia as to the horizontal/ground is 25-30° from symphysis to ischium spine in the upright position

the posterior wall of the urethra, uv-junction and the bladder trigonum are not expanding during the asymmetric filling of the bladder; therefore these structures are firmly fixed to the pubocervical musculofascia/endopelvic diaphragm whilst

the anterior vagina wall is rapidly expanding and deflating with shearing during sexual intercourse and even more during childbirth and as such is loosely connected/fixed to the pubocervical musculofascia/endopelvic diaphragm

**arcus tendineus fasciae = atf**
as bilateral fixation/insertion of the endopelvic diaphragm/pubocervical musculofascia whilst

the arcus tendineus fasciae is further connected to the lateral pelvis wall (arcus tendineus of levator ani muscle and oburator internus muscle fascia) via a narrow triangular fascia sheath

**cervix**
the cervix is considered to be the centrum tendineum intrapelvinum since all musculofascia structures of the endopelvic diaphragm are firmly anchored onto it and the cervix itself is firmly anchored into the central pierced thru punched out opening within the endopelvic diaphragm

**cardinal ligaments and broad ligaments**
since their smooth muscle fibers radiate into the cervix they support the endopelvic diaphragm restricting its downward movement

**sacrouterine ligaments = rectouterinus muscles**
as posterior fixation of the endopelvic diaphragm onto the sacrum since they fix/connect the cervix posteriorly onto the rectum and sacrum restricting its anterior movement

with lateral fixation to the pelvis wall (coccygeus muscles, sacrospinous ligaments and priformis muscles) via fascia sheaths

they contract during childbirth keeping the cervix in its position by preventing upward movement

**(part of the) rectovaginal fascia**
In between the vagina and rectum and anchored onto the posterior cervix in between the sacrouterine ligaments as part of the endopelvic diaphragm

**weakest point in endopelvic diaphragm/pubocervical musculofascia**
considering the anterior cone-like triangular shape with the narrowest at the pubis bones and the broadest in between the ischium spines the weakest point is in the median at the anterior cervix

and the **broader the pelvis** (with broad span) the **more prone for median defects** and as such for stress incontinence, urethrocele, cystocele and cervix prolapse
innervation

by intrinsic myogenic impulses
from baroreceptors for tonic action for a long-standing non-fatigue tonus to counteract
the intraabdominal hydrostatic pressure and from stretch receptors for an immediate
phasic action upon stretch on sudden intraabdominal pressure rise as superimposed
upon the already existing tonic action

as modulated

by extrinsic impulses
from the autonomic nervous system via complex mechanism of reflex action and from
hormones and from other neurotransmitters

it is very well possible that there are also impulses from the enteric nervous system

mechanism of physiologic action

the endopelvic diaphragm is a single-unit smooth muscle structure with tonic action for
a non-fatigue tonus to counteract the hydrostatic pressure and immediate reactive
phasic action by contraction upon stretch as superimposed upon the tonic action to
counteract sudden intraabdominal pressure rise, like cough, standing up etc

this in combination with the synchronized multi-unit archaic matrix of the corpus intra
pelvinum with its other single-unit smooth muscle specialized structures

and as such stabilizing/securing the pelvis organs in their variable anatomic position and
supporting the continence mechanisms

especially preventing the posterior bladder neck, posterior uiv-junction and posterior
urethra wall from backward rotation with funneling of the urethra

this explains the fact that even under spinal anesthesia and with a filled bladder a
sudden fist push onto the suprapubic lower abdominal wall combined with coughing
does not result in urine loss thru the evo (as stress incontinence) when the endopelvic
diaphragm is intact

this test is a standard procedure to check continence during all our reconstructive pelvis
surgery

reaction to biomechanic stress and hormones

during pregnancy there is continuously increasing intraabdominal hydrostatic pressure
combined with hormonal flooding

since smooth muscle cells are also capable to multiply if the need arises the endopelvic
diaphragm will then react by hypertrophy and hyperplasia according to the increasing
intraabdominal hydrostatic pressure and hormones
during the puerperium the endopelvic diaphragm will involute as well according to the decreasing intraabdominal hydrostatic pressure until an equilibrium has been achieved

**nb** the decrease of estrogens in the second half of the cycle may explain the fact that the symptoms of stress incontinence may worsen during the second half of the cycle

**mechanism of pathophysiologic action**

the downward intraabdominal pressure upon the endopelvic diaphragm may lead to defects within this diaphragm

the downward pressure increases during the course of pregnancy with highest pressure at the median where the cervix is anchored into the endopelvic diaphragm

the broadest part of the endopelvic diaphragm is in between the ischium spines where it stabilizes and secures the cervix and

this is exactly where splitting/division of the longitudinal smooth muscle/collagen fibers at the median starts and then continues from proximally to distally whilst

the endopelvic diaphragm fibers retract bilaterally since medially disrupted

normally the most distal 1-2 cm stay intact since the short span is able to withstand the pressure and the smooth muscle/collagen fibers are also transverse (and longitudinal)

it is good to remember that during childbirth itself the pressure changes from downward caudad to upward cephalad and that semicircular compression and shearing occur at where the endopelvic diaphragm is attached to pubis bone and atf

in prolonged obstructed labor pressure necrosis may develop and lead to anatomic tissue loss defects at any location within the endopelvic diaphragm

then there may be direct trauma (penetration, surgery) and trauma due to infection

**defects within the endopelvic diaphragm**

there are two types of defects viz defects **without** anatomic tissue loss like those due to intraabdominal pressure or shearing and defects **with** anatomic tissue loss varying from minimal to (sub)total loss like those due to pressure necrosis in prolonged obstructed labor or due to infection or due to surgery

**aa defects without anatomic tissue loss**

since it is the first line of withstanding intraabdominal hydrostatic pressure especially during pregnancy and also withstanding shearing forces during sexual intercourse and physiologic vaginal childbirth

it is clear that defects may develop weakening the endopelvic diaphragm in varying degrees from minor to extensive
it is good to realize that during pregnancy the direction of long-term pressure is from cephalad to caudad whilst during childbirth the short-term pressure is from caudad to cephalad upon this diaphragm

since it has multiple functions, like supporting the urine continence mechanism and securing the organs in their anatomic position, defects within the diaphragm will have different effects depending upon their location

the possibilities are as following: anterior, median, lateral, central and posterior; isolated or in any combination

**anterior defects**
with weakening of the urine continence support since the posterior urethra wall will “rotate backward” away from the symphysis causing vesicalization of the (proximal) urethra since fixed/adhesive anterior urethra wall
by this mechanism genuine or postrepair intrinsic stress incontinence develops

**median longitudinal defects**
depending upon its location the posterior urethra, bladder base may herniate thru this defect into the zero-pressure vagina and eventually prolapse to the outside
only if there is also concomitant weakening of the support or dorsal-directed pull on the posterior urethra wall towards the sacrum the urine continence mechanism may be involved

**central defect**
the cervix/uterus will herniate thru this defect into the vagina and then may prolapse unopposed to the outside thru the hernia-prone opening in the pelvis floor dragging the anterior vagina wall with it like intussusception
only infrequently if there is concomitant weakening of the support or dorsal-directed pull on the posterior urethra wall towards the sacrum the urine continence mechanism may be involved
normally there is full urine continence in total uterus/cervix prolapse c3 or c4 even with a urethra length of only 0.5-1 cm
however, with increased longitudinal bladder diameter, shortened urethra and narrow external urethra opening

**apical defect**
this will result in herniation of the intraperitoneal contents into the zero-pressure vagina

**posterior defects**
this will result in herniation of the rectum into the zero-pressure vagina especially when combined with perineal body defects

**lateral defects at atf**
this will result in loss of tonus of the endopelvic diaphragm and increase in the caudad/cephalad movements but not in herniation/prolapse of an organ thru this defect

**lateral defects of the fascia sheath in between the atf and atlam**
this will result in medial displacement of the atf with loss of tonus and hypermobility of the endopelvic diaphragm but not in herniation/prolapse of an organ thru this defect

**other location**
due to penetrating trauma or forceps delivery or vacuum delivery
**bb** defects with anatomic tissue loss

It is good to realize that in any obstetric urine fistula there is anatomic tissue loss of the endopelvic diaphragm/pubocervical musculofascia as well.

Therefore in obstetric trauma surgery one should make an effort to identify the musculo fascia defects and repair them together with the fistula.

The extent and location of pressure necrosis lesions in prolonged obstructed labor may be from minimal to extensive and from one location to the other in an endless variation which makes the obstetric trauma so intriguing.

**Circular punched out defects**

The same size as the fistula or (slightly) bigger than the fistula

**Transverse curved defects**

Bigger than the fistula whereby the fistula is somewhere within this defect

**Quartercircular defects**

With partial or total anatomic loss of atf and atlam and possible partial loss of levator ani muscles, obturator muscles and obturator membrane

With fistula formation and possible opening of the paravesical space

**Semicircular defects**

With partial or total anatomic tissue loss of atf and atlam; and with partial tissue loss of the levator ani muscles, obturator internus muscles and obturator membrane; eventually with bare bones

With fistula formation and opening of the paravesical space

**(Sub)total pubocervical musculofascia loss**

Regularly (sub)total fascia loss with extensive fistula formation and anterior vagina wall loss and total loss of atf and atlam and (partial/extensive) loss of levator ani muscles, obturator internus muscles and obturator membrane is found with bare bones in a so-called empty pelvis

**(Sub)total endopelvic diaphragm loss**

From time to time (sub)total loss of the whole diaphragm may be found with extensive soft tissue loss resulting in extensive urine/stool fistulas as cloaca; for these unfortunate women nothing can be done

However, anatomic tissue loss may also be found due to surgery whereby tissue is excised

Or due to necrotizing infections like postmeasles noma vaginae

**CC** combination of functional with anatomic defects

This combination of **aa** and **bb** is always possible and has to be checked for during the reconstructive procedure.
reconstructive surgery

it is important first to identify the real (extent of the) defect(s) and then reconstruct the functional anatomy meticulously using autologous structures so that normal physiology will be ensured whilst

special attention has to be given to check that all (musculo)fascia structures are firmly (re)connected to the cervix as the centrum tendineum intrapelvinum

discussion

the endopelvic diaphragm as part of the corpus intrapelvinum is an important dynamic structure

it constitutes a real diaphragm with the cervix as its center with a small anterior median opening for the urethra and a larger posterior median opening for the rectum

separating the distal urinary tract, proximal genital tract, intraperitoneal contents and distal digestive tract (rectum) from the zero-pressure vagina

counteracting as first line the intraabdominal hydrostatic pressure due to the non-fatigue dynamic tonus of its smooth muscle component by its tonic action via baroreceptors as modulated by the autonomic nervous system; whilst the rest pressure is then dealt with by the pelvis floor structures

with immediate reactive phasic action contraction upon stretch as superimposed upon the already existing tonic action in case of sudden intraabdominal pressure rise

contributing to securing and stabilizing the pelvis organs in their variable anatomic position and as such

supporting the anatomic urine and genital continence mechanisms

defects in this diaphragm are rather common and may be due to (increased) hydrostatic pressure, shearing by vaginal childbirth, pressure necrosis during prolonged obstructed labor, penetrating trauma and necrotizing infection; as also influenced by hormonal and ageing processes

depending upon (the large variety of) the anatomic location and extent of these defects the following is possible

intrinsic stress incontinence, ?cervix incompetence?, urethrocele, vesicocele, uterus/cervix prolapse, enterocele and rectocele; either isolated or in combination

there is a clear correlation between genuine intrinsic urine incontinence, cystocele and cervix prolapse with a wide pubic arch of ≥ 90° as indication of a wide pelvis

simply since the wider the pelvis the broader the span by the diaphragm and the more chance the longitudinal fibers will split/divide in the midline; with its weakest point just anteriorly from the cervix where the span is the widest
though lateral defects due to hydrostatic pressure and/or shearing at atf level and lateral defects in the narrow triangular fascia sheath between atf and atlam are possible this will not lead to herniation of the posterior bladder wall thru these defects into the vagina

at least the author has not encountered this as the cause of cystocele; the only time the author encountered a lateral defect with cystocele formation was in a patient who developed a fourth obstetric fistula after successful repair of three previous obstetric fistulas including an extensive type IIIBb

in quartercircular and semicircular defects (always combined with lateral defects) with anatomic tissue loss of the endopelvic diaphragm and with fistula formation ensuring an empty bladder, another mechanism comes into play according to the natural tissue forces; besides the fact that the urethra and bladder will retract in opposite directions which is the opposite of what one would expect

due to the balloon-like structure of the bladder with anterior bladder wall adherent/sticking to the posterior symphysis this will result in anterior and cephalad pull onto the posterior bladder (neck) wall whereby the loose endopelvic diaphragm is pulled as well and will re-attach onto the pubis bones and bilateral pelvis wall at a more anterior and cephalad level due to the natural tissue forces

actually, the saucer-like shape of the empty bladder in the normal anatomic situation is caused by the fact that the fixation of the posterior bladder wall onto the endopelvic diaphragm prevents the natural tissue forces from adapting the posterior bladder wall onto the anterior bladder wall

in identifying the endopelvic diaphragm look for shiny smooth muscle tissue
evidence-based practice

clinical science

excellent final healing rate

variety hypotonic bladder

hypotonic bladder

without avw trauma
with necrotic or healed avw trauma
with extensive obstetric trauma
with obstetric urine fistula
with necrotic or healed pvw trauma
with sphincter ani rupture
with neurogenic component
with hourglass urethra
negative anal reflex
atypical
hypotonic bladder + no avw trauma

day 5

katsina
cath 621

fabk (katsina)

female 16 yr
17.08.98

Diagnosis: PI, overflow incontinence due to atonic bladder, **leaking urine for 5 days** *(no spontaneous miction)* that started immediately following obstructed labor for 3 days, in hospital sb female, married 2 yr ago post(menarche 10 mth earlier), still living at husband, no menstruation, drop foot R (grade 3) and L (grade 3) no rvf, no yankan gishiri; normal ap diameter/narrow pubic arch except for bulging no visible avw trauma

149.0 cm

17.08.98 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 25 cm), moderate elevation after draining > 1,500 ml of urine, euo/b 2 cm *(vesicalization)* foley ch 18 increased bladder capacity (longitudinal diameter 25-2 = 23 cm, **atonic bladder**)

01.09.98 not leaking at all
02.10.98 not leaking at all cath removed bladder drill
10.11.98 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
14.12 + 09.02.99 idem
13.04.99 not leaking at all, no incontinence normal mition healed, no stress

09/11-99 **amenorrhea for 4 mth** not leaking at all **instructions**

hypotonic bladder
hypotonic bladder + superficial avw trauma day 3

katsina cath 546

continence mechanism trauma without fistula

zig (katsina) female 30 yr 21.12.96

diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 3 days which started immediately following obstructed labor for 3 days, at home sb male, married 17 yr ago post(menarche 2 mth earlier), not at husband, no menstruation, no rvf, drop foot R (grade 3) and L (grade 4); normal pubic arch, no h/o yankan gishiri, superficial avw trauma 159.5 cm

21.12.96 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 22 cm), moderate elevation after draining >1,500 ml of urine, euo/b 2 cm (vesicalization); foley ch 18 increased bladder capacity (longitudinal diameter 22-2 = 20 cm, atonic bladder)

19.01 + 04.02.97 not leaking at all; cath removed, bladder drill!
11.03.97 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence
02.09.97 amenorrhea for 3 mth not leaking at all instructions

superficial avw trauma
hypotonic bladder + necrotic avw trauma  
no fistula formation  
katsina  
cath 545

hypotonic bladder with necrotic avw trauma; no fistula formation

sgdf (katsina)  
female  
22 yr

12.12.96

suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 20 cm), no elevation after draining of >1,500 ml urine, euo/b 2 cm (vesicalization); foley ch 18

18.12.96  
necrotic tissue removed:  
debridement

24.12.96  
not leaking at all  
condition better

10.01.97  
not leaking at all  
insp/ seems healing

29.01.97  
not leaking at all  
no fistula;  
cath removed,  
bladder drill!

04.02.97  
not leaking at all, no incontinence, normal miction

12.03.97  
not leaking at all, no incontinence, normal miction

18.08.97  
not leaking at all, no incontinence, normal miction

16.11.99  
amenorrhea for 3 mth  
not leaking at all  
instructions

necrotic 4 cm 0
hypotonic bladder + extensive obstetric trauma
day 15

no fistula formation
documentation of fresh trauma at pelvis inlet ring

shbb (kano) female 17 yr 16.10.06
diagnosis: PII (1 alive), necrotic + 6x4 cm transverse urethrovescovaginal fistula IIAb with overflow incontinence due to atonic bladder, leaking urine for 15 days which started immediately following obstructed labor for 1 day, at home sb male, married 4 yr ago pre(menarche 3 mth later), not living with husband, no menstruation, drop foot R (grade 4) and L (grade 4), healing necrotic + 1.5 cm 0 midline proximal pvw at 2 cm from posterior cervix, no rvf, no yankan gishiri; normal ap diameter/pubic arch 85°, ar pos, necrotic pc_oc_ic musculature R at atl continuous with necrotic fistula R > L
euo/f 2 cm, f/c 2 cm

16.10.06 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 22 cm), moderate anterior elevation after draining > 2,000 ml urine, euo/b 2 cm (vesicalization) foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 22-2 = 20 cm, atonic bladder) will it heal considering circumferential defect acceptable position uv-junction against middle/caudad third symphysis normal-width 2 cm urethra_euo in anatomic position

30.10 + 06.11 not leaking at all insp/ nicely healing documented
20.11.06 not leaking at all healed cath removed documented
04.01.07 not leaking at all, no incontinence, normal miction stools ok insp/ both healed, good elevation, no stress incontinence
11.02.07 idem
09.04.07 not leaking at all, stools ok, normal miction both healed, no stress
23.07.07 amenorrhea for 5 mth not leaking at all instructions
hypotonic bladder + necrotic avw trauma
fistula formation

katsina
cath 1214
necrotic avw with fistula formation

habg (katsina) female 15 yr 03.09.09
day 12

diagnosis: PI (0 alive), overflow incontinence due to atonic bladder with + 3 cm 0
necrotic urethrovessicovaginal fistula IIAb, leaking urine for 12 days
which started immediately following obstructed labor for 2 days, in
hospital sb male, married 2 yr ago pre(menarche 1 mth later), not living
with husband, no menstruation, drop foot R (grade 2-3) and L (grade 3-4),
no rvf, no yankan gishiri, eclampsia yes; normal ap diameter/public arch
85°, ar pos referral
euo/f 1 cm, f/c 2 cm

03.09.09 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/
bw 26 cm, poor anterior elevation after draining >2,000 ml of urine, euo/b
0.5 cm (vesicalization) foley ch 18; free urine flow
increased bladder capacity (longitudinal diameter 26-0.5 = 25.5 cm, an
atomic bladder)
poor position of uv-junction against caudal third of symphysis
normal-width 0.5 cm poor-quality urethra_euo in anatomic position
probably it will not heal since deep necrosis

23.09.09 leaking small fistula IIAb for review 7 days R=3 L=4
17.10.09 not leaking at all insp/ balloon in fistula
residual 2 cm fistula

18.10.09 operation: circ uvvf-repair vvf 7707
16.11.09 not leaking at all cath removed bladder drill
23.11 + 21.12 + 01.03 not leaking, incontinence +, miction healed, stress +
15.05.10 not leaking at all, no incontinence, normal miction
insp/ healed, good elevation, no stress incontinence

17.01.11 amenorrhea for 3 mth not leaking at all instructions
hypotonic bladder + obstetric fistula

day 59

pt 4496

katsina

type: vvf 5836

questions:

?? does this patient give better insight into atonic bladder??

smooth muscle fibers not healing

smg (katsina)

female 17 yr 28.06.03

surgeon: keres waaldijk

assistant: gambo lawal

diagnosis: PII (0 alive), ± 3 cm 0 urethrovaginal fistula IIb with circumferential defect, leaking of urine for 59 days which started immediately following obstructed labor for 3 days, in hospital sb male, married 2 yr ago post(menarche 2 yr earlier), not with husband, no menstruation, drop foot R (grade 2) and L (grade 2) no rvf, no yankan gishiri; normal ap diameter/pubic arch 85°, major pc muscle loss (bare pubic bones) ref suprapubic mass, euo/b 25 cm, anal reflex neg, saddle anesthesia present stool flatus incontinence atonic bladder euo/f 1 cm, f/c 4 cm, ab/au 2.5 cm 156.0 cm

operation: circumferential uvvf-repair
duration: 30 min
anesthesia: spinal L4/L5 with 4 ml bupivacaine 0.5%

episiotomy L, draining > 750 ml urine, incision at distula edge, sharp circumferential dissection, advancement/caudad fixation of anterior bladder to symphysis/urethra, tens on-free circumferential uvvf-repair by end-to-end vesico urethrourethrostomy by single layer of inverting serafit, triple fixation foley ch 18, transverse skin avw/avw adaptation by 2x everting seralon, skin closure, pack; free urine flow, euo/bw 22 cm, good elevation, euo/b 1 cm (loss + vesicalization) increased bladder capacity (longitudinal diameter 22-1 = 21 cm)
poor position uv-junction against caudad third symphysis

11.08.03 not leaking, incontinence + cath removed bladder drill 18.08.03 not leaking, incontinence +, normal miction healed, stress + so 21.09 + 22.12.03 not leaking at all, no incontinence, normal miction ar pos insp/ healed, good elevation, no stress incontinence

10.04.05 amenorrhea for 3 mth not leaking at all instructions

RR
preanesthesia: 130/90 mm Hg 5": 120/80 10": 120/70 postoperation: 110/70
hypotonic bladder + necrotic avw/pvw trauma + urine fistula formation

day 4

cath 706

anal reflex neg and stool/flatus incontinence

asser (kaduna) female 16 yr 02.01.01

katsina
diagnosis: PII (0 alive), overflow incontinence due to atonic bladder with 3 cm 0 avw
deep necrosis/trauma, leaking urine/stool_flatus incontinence for 4 days which started immediately following last obstructed labor for 4 days, at home sb male, married 3 yr ago pre(menarche 4 mth later), still with husband, no menstruation, drop foot R (grade 1) and L (grade 2), + 4 cm 0 deep pvw trauma/necrosis fixed to cervix; normal ap diameter/narrow pubic arch 75° kees IIAb anal reflex neg referral euo/avwn 5 cm, avwn/c 0 cm, a/pvwn 8 cm 153.0 cm

02.01.01 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 20 cm), poor elevation after draining > 1.500 ml urine, euo/b 2 cm increased bladder capacity (longitudinal diameter 20-2 = 18 cm, atonic bladder)
poor position uv-junction not against middle/caudad third symphysis

18.01.01 leaking insp/ 4 cm 0 fistula

21.01.01 operation: uuvf-"repair" vvf 4965
20.02.01 not leaking at all cath removed bladder drill
27.02 + 06.04 + 08.10.01 not leaking at all, no incontinence, normal miction insp/ both healed, good elevation, no stress incontinence stools ok

10.06.04 amenorrhea for 4 mth not leaking at all instructions
second obstetric fistula completely ok until PIII (0 alive) sb male in hospital

17.09.06 operation: circ uuvf-repair vvf 6854
16.10.06 not leaking at all cath removed bladder drill
30.10.06 not leaking, incontinence ± normal miction insp/ healed, good elevation, no stress incontinence

13.12.06 amenorrhea for 5 mth not leaking at all instructions
hypotonic bladder + proximal pvw trauma
also necrotic avw trauma

day 5

katsina

cath 575

rvf

rdd (katsina)
female
14 yr
12.07.97

diagnosis: PI, overflow incontinence due to atonic bladder, + 5 cm avw trauma kees IIAa midline/R, + 4 cm 0 pvw kees Ia trauma, leaking urine/stool_flatus incontinence of 5 days (no spontaneous miction) that started immediately following obstructed labor of 3 days, in hospital (craniotomy) sb female, married 1 yr ago pre(menarche 2 mth later), not with husband, drop foot R (grade 2-3) and L (grade 2-3), no yankan gishiri; borderline pubic arch euo/avwt 2 cm, avwt/c 0 cm, a/pvwt 6 cm, pvwt/c 0 cm 148.0 cm

12.07.97 suprapubic mass, aww not bulging into vagina, bladder overdistended (euo/bw 18 cm), good elevation after draining 500 ml urine, euo/b 2.5 cm increased bladder capacity (longitudinal diam 18-2.5 = 15.5 cm, atonic bladder) regular check for development of fistula!!

25.08.97 not leaking at all cath removed bladder drill
01.09.97 not leaking, no incontinence, normal miction stools ok insp/ both healed, good elevation, no stress
15.09 + 15.10 + 17.12 idem
10.02.98 not leaking at all, stools ok, normal miction both healed, no stress

04.11.98 amenorrhea for 4 mth not leaking at all, stools ok instructions second obstetric fistula completely ok until PII (0 alive) sb male in hospital
09.02.00 operation: uvvf-repair vvf 4699
29.02.00 not leaking at all cath removed bladder drill
21.03.00 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
04.04 + 08.05 + 30.06.00 idem
24.08.00 not leaking at all, no incontinence, normal miction healed, no stress

27.03.01 amenorrhea for 3 mth not leaking at all instructions
**hypotonic bladder + distal rvf kees IIa**

day 7

katsina
cath 427

iasb (kano) female 15 yr 02.11.94

diagnosis: PI, overflow incontinence due to atonic bladder, distal rectovaginal fistula kees IIa, leaking urine/passing stools per vaginam for 7 days which started immediately following obstructed labor for 3 days, in hospital sb male, married 2 yr ago pre(menarche 1 mth later) not living with husband, no menstruation, no (h/o) drop foot; narrow pubic angle, no visible avw trauma

02.11.94 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/ bw 18 cm), > 750 ml foul-smelling urine, euo/b 2 cm; good elevation after emptying bladder; on suprapubic pressure urine from euo increased bladder capacity (18-2 = 16 cm) foley ch 18

16.11.94 pat not drinking enough instructed

19.12.94 not leaking at all cath removed bladder drill

05.01.95 not leaking at all, no incontinence, normal miction healed, no stress

**14.01.95 operation: rvf-repair**

18.05.95 not leaking at all, no incontinence, normal miction stool ok insp/ healed, good elevation, no stress incontinence

14.09.95 amenorrhea for 3 mth not leaking at all/stool ok instructions
hypotonic bladder

**hypotonic bladder + negative anal reflex**

*day 3*

also stool/flatus incontinence

katsina
cath 689

anal reflex neg and stool/flatus incontinence

rvf
dsu (katsina)
female
15 yr
02.06.00

diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine/stool/flatus incontinence for 3 days which started immediately following an obstructed labor of 1 day, in hospital sb female, married 3 yr ago premenarche 1 yr later), not living with husband, no menstruation, drop foot R (grade 3) and L (grade 4), no yankan gishiri; normal ap diameter/narrow pubic arch 75°, referral

154.5 cm

02.06.00 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 20 cm), moderate elevation after draining > 1,000 ml of urine, euo/b 2 cm (vesicalization) anal reflex neg foley ch 18 increased bladder capacity (longitudinal diameter 20-2 = 18 cm, atonic bladder)

18.07.00 not leaking at all cath removed bladder drill

04.08.00 not leaking at all, no incontinence, normal miction R =4 L =4 insp/ healed, good elevation, no stress incontinence

22.10.00 idem stool/flatus ok

28.03.01 not leaking at all, stool/flatus ok, normal miction healed, no stress

23/11-01 amenorrhea for 3 mth not leaking at all instructions

second obstetric fistula PI II (0 alive) SB male by cs anal reflex pos

07/03-03 operation: circumferential uvvf-repair vvf 5727

new third ?obstetric? fistula pat refuses to tell what happened

04/07-04 operation: urethra_avw vvf 6203

19/01-05 operation: uvvf-repair vvf 6377

08.03.05 not leaking at all cath removed bladder drill

16/03-05 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

23/05-05 leaking & miction insp/ fistula early sex

hypotonic bladder
hypotonic bladder + sphincter ani rupture  

katsina  
cath 517  
rvf

mssd (katsina)  
female  
14 yr  
22.04.96

diagnosis:  PI, **atonic bladder** with overflow incontinence, 3° perineum tear with sphincter ani rupture, **leaking urine/stool incontinence of 32 days** that started immediately following obstructed labor for 2 days, in hospital SB male, married 1 yr ago post(menarche 3 mth earlier), not living with husband, no menstruation, drop foot R (grade 3) and L (grade 1); normal pubic arch, but small ap diameter 156.0 cm

22.04.96 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 20 cm), moderate elevation after draining 1,500 ml urine, euo/b 2 cm foley ch 18  
increased bladder capacity (longitudinal diameter 20-2 = 18 cm, **atonic bladder**)

30.06.96 cath out x 2/7  not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence

07.08.97 **amenorrhea for 4 mth**  not leaking at all, stools ok  
instructions
hypotonic bladder + sphincter ani rupture
day 19
full stool/flatus continence
katsina
cath 754
spincter ani rupture; no complaints
rvf

usf (katsina) female 15 yr 11.04.02

diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 19 days that started immediately following forceps delivery (23.03.02) b.c.o. obstructed labor of 2 days, sb female, married 3 yr ago pre(menarche 1 yr later), not living with husband, no menstruation, sphincter ani rupture (without complaints: no stool_flatus incontinence), drop foot R (grade 1) and L (grade 2), no yankan gishiri; normal ap diameter/pubic arch 85°, no avw trauma

11.04.02 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 18 cm), poor elevation after draining > 1,250 ml urine, euo/b 1 cm (vesicalization) foley ch 18 increased bladder capacity (longitudinal diameter 18-1 = 17 cm, atonic bladder)
poor position of uv-junction against caudad third of symphysis

20.05.02 not leaking at all cath removed bladder drill
27.05.02 not leaking at all, no incontinence, normal miction stools/flatus ok
insp/ healed, good elevation, no stress incontinence
08.07.02 not leaking at all, no incontinence, normal miction healed, no stress
hypotonic bladder + sphincter ani rupture

sphincter ani reconstruction

katsina

rvff 413
cath 570

kdm (rép niger)  

female 23 yr 18.06.97

surgeon: kees waaldijk
assistant: gambo lawal
diagnosis: PIV (0 alive), atonic bladder, sphincter ani rupture with 2 cm long rectum trauma, leaking urine/stool-flatus incontinence for 60 days (2 mth) which started immediately following obstructed last labor for 1 day, at home sb male, married 10 yr ago post-menarche 3 mth earlier, not living with husband, no menstruation, no (h/o) drop foot, no yankan gishiri; wide pubic arch, perineum tissue bridge narrowing vagina introitus a/f 0 cm sphincter operated 1x 157.0 cm

operation: rectum closure and sphincter ani/perineal body reconstruction
duration: 20 min
anesthesia: spinal L3/L4 with 4 ml bupivacaine 0.5%

longitudinal severing of perineum tissue bridge, incision at pvw edge, sharp dissection of pvw, sharp/blunt mobilization of pararectal/sphincter tissue, completely tension-free longitudinal rectum closure by an intrarectal layer of inverting serafit with adaptation of sphincter and an intravaginal layer of chromic catgut inverting, sphincter ani/perineal body reconstruction by 3x serafit, deep low-tension perineum closure by 3x everting supramid leaving pvw open

suprapubic mass, awv bulging into vagina, bladder overdistended (euo/bw 18 cm), moderate elevation after draining > 500 ml urine, euo/b 2 cm increased bladder capacity (long diameter 18-2 = 16 cm, atonic bladder)

poor position of uv-juntion away from middle third of symphysis

20.07.97 stools ok, not leaking cath removed bladder drill
08.12.97 not leaking at all, no incontinence, normal miction stools ok

31.08.98 amenorrhea for 7 mth not leaking at all, stools ok instructions

RR
preanesthesia: 140/90 mm Hg
5': 130/80
10': 120/80
postoperation: 100/60

hypotonic bladder
hypotonic bladder + hourglass urethra_euo  mth 4
long-standing

zaria  cath 112
sacral plexus trauma  rvf
was 7 days in hospital bco eclampsia; then she delivered vaginally

rurc (kaduna)  female  20 yr  19.11.15

diagnosis:  PIII (1 alive), total urine incontinence III or still atonic bladder, leaking urine for 4 mth which started immediately following obstructed last labor x 7 days (eclampsia), live male, married 5 yr ago post(menarche 2 yr earlier), still with husband, no menstruation, no drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri, yes eclampsia; normal ap diameter/wide pubic arch 95°, ar slightly pos, flatus inc, no saddle anesthesia cx fixed, except for bulging no visible avw trauma  obesity ++

19.11.15 objective incontinence +++; no suprapubic mass, bladder “overdistended” (euo/bw 19 cm), avw bulging after draining only 50 ml urine, gv: no leakage/no clear urine; foley ch 18; free urine flow, euo/b 1.0 cm increased bladder capacity (longitudinal diameter 19-1 = 18 cm) poor position of uv-junction against caudad third symphysis open hourglass 1 cm good–quality urethra_euo slightly drawn inside may still benefit from catheter for 4 weeks then review

17.12.15 not leaking at all  cath removed  bladder drill
24.12.15 not leaking at all, no incontinence, norma miction insp/ healed, moderate elevation, no stress incontinence
18.01.16 not leaking at all, no incontinence, normal miction healed, no stress
hypotonic bladder + sacral plexus trauma
day 30
neg ar, saddle anesthesia, flatus inc
kano cath 728
kano fortnight atonic bladder with neurogenic component
sacral plexus trauma
rvf

usrl (kano city) female 14 yr 21.02.05
diagnosis: PI (0 alive), overflow neurogenic total urine incontinence, healed ± 1 cm
0 avw kees IIa trauma, leaking urine 30 days that started immediately
following obstructed labor for 3 days, in hospital sb male, married 1 yr ago
post(menarche 3 mth earlier), not living with husband, no menstruation,
drop foot R (grade 3) and L (grade 3), no rvf, no yankan gishiri; normal ap
diameter/wide pubic arch 90°, ar neg with saddle anesthesia and flatus
incontinence
euo/avwt 3 cm, avwt/c 3 cm 150.0 cm

21.02.05 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/
bw 20 cm), moderate anterior elevation after draining 1,500 ml of urine,
euo/b 2 cm (vesicalization)
increased bladder capacity (longitudinal diameter 20-2 = 18 cm, atonic
bladder)
acceptable position uv-junction against middle/caudad third symphysis

29.03.05 not leaking at all cath removed bladder drill
22.05 + 24.07 + 21.08 + 24.10 + 27.11.05 not leaking, incontinence +, normal miction
insp/ healed, good elevation, stress incontinence ++
24.10.05 ar slightly pos, still saddle hypesthesia flatus ok
14.05.06 not leaking at all, no incontinence, normal miction stools ok
insp/ healed, good elevation, no stress incontinence
30.07.06 not leaking at all, no incontinence, normal miction healed, no stress
hypotonic bladder

kano  cath 1022

atypical: leaking started after 4 days, excellent elevation, euo/b 3.2 cm

zubaida yahaya kademi (kano) female 38 yr 01.08.19

diagnosis: PX (3 alive), overflow incontinence due to hypotonic bladder, leaking urine of 50 days which started 4 days following obstructed last labor for few hours, in hosp, sb male, married 25 yr ago pre(menarche 2 mth later), still living with husband, no menstruation, no drop foot R (grade 6) and L (grade 5), no rvf, no yankan gishiri, no eclampsia; normal ap diameter/wide pubic arch 90°, ar pos cervix mobile

no visible aw trauma, not even bulging but excellent elevation

01.08.19 suprapubic mass, excellent anterior elevation; bladder overdistended, euo/bw 22 cm, excellent elevation after draining > 2,500 ml urine, euo/b 3.2 cm foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 22-3.2 = 19 cm) normal-width 3 cm good-quality urethra_euo in anatomic position

21.08.19 not leaking at all cath removed bladder drill

22.09.19 not leaking at all, no incontinence, normal miction instp/ healed, excellent elevation, no stress incontinence

atypical hypotonic bladder

day 50
atypical hypotonic bladder due to ?? yr 1
long-standing
kano
cath 745
long-standing atonic bladder
aadm (kano city) female 46 yr 12.10.05
diagnosis: PII (0 alive), overflow incontinence due to atonic bladder, leaking urine for 1 yr which started just like that, married 35 yr ago pre(menarche 2 yr later), still living with husband, normal menstruation, no VVF, no RVF, no yankan gishiri; normal ap diameter/pubic arch 85°, ar pos, no flatus stool incontinence
12.10.05 suprapubic mass, avw indurated + bulging into vagina, bladder overdistended (euo/bw 18 cm), moderate anterior elevation after draining > 750 ml urine, euo/b 1.5 cm (vesicalization), no sign of outflow obstruction (distal urethra normal diameter no stricture) increased bladder capacity (longitudinal diameter 18-1.5 = 16.5 cm, atonic bladder) poor position of uv-junction against caudad third of symphysis foley ch 18 for 8-10 weeks + immediate bladder drill upon removal
20.11.05 not leaking at all cath removed bladder drill
04.12.05 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
28.05.06 not leaking at all, no incontinence, normal miction healed, no stress

total avw induration
evidence-based practice

clinical science
excellent final healing rate

different “healing” stages hypotonic bladder

longitudinal bladder diameter

25 cm
24 cm
23 cm
22 cm
21 cm
20 cm
19 cm
18 cm
17 cm
16 cm
15 cm
14 cm
13 cm
bladder diameter 27-2 25 cm
day 4

katsina  cath 736

nfbb (katsina)  female  26 yr  10.09.01

diagnosis: PV (2 alive), extensive necrotic + 6x4 cm urethrovesicovaginal fistula IIa, leaking urine for 4 days which started immediately after obstructed last labor for 3 days, at home sb male, married 13 yr ago pre(menarche 1 mth later), still living with husband, no menstruation, drop foot R (grade 4) and L (grade 4), no rvf, no yankan gishiri; normal ap diameter/pubic arch 85° no stool flatus incontinence relative
euo/f 2 cm, f/c 0 cm 149.5 cm

10.09.01 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 27 cm), moderate elevation after draining > 2,500 ml of urine, euo/b 2 cm (vesicalization) anal reflex neg increased bladder capacity (longitudinal diameter 27-2 = 25 cm, atonic bladder)
will it heal since deep necrosis?

1 cm fistula kees IIa euo/bw 12 cm euo/b 1 cm

07.10.01 operation: uvvf-repair vvf 5260
13/11-01 not leaking, incontinence + insp/ healed, stress incontinence +
03/05-02 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

28.02.03 amenorrhea for 6 mth not leaking at all instructions
**bladder diameter** 26-0.5 cm 25.5
day 12

katsina        cath 1214

habg (katsina) female 15 yr 03.09.09

diagnosis: PI (0 alive), overflow incontinence due to atonic bladder with + 3 cm 0 necrotic urethrovesicovaginal fistula IIAb, leaking urine for 12 days which started immediately following obstructed labor for 2 days, in hospital sb male, married 2 yr ago pre(menarche 1 mth later), not living with husband, no menstruation, drop foot R (grade 2-3) and L (grade 3-4), no rvf, no yankan gishiri, eclampsia yes; normal ap diameter/pubic arch 85°, ar pos referral euo/f 1 cm, f/c 2 cm 156.0 cm

03.09.09 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 26 cm, poor anterior elevation after draining > 2,000 ml of urine, euo/b 0.5 cm (vesicalization) foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 26-0.5 = 25.5 cm, an atonic bladder)
poor position of uv-junction against caudad third of symphysis normal-width 0.5 cm poor-quality urethra_euo in anatomic position probably it will not heal since deep necrosis

23.09.09 leaking insp/ small fistula IIAb for review 7 days R=3 L=4

17.10.09 not leaking at all insp/ balloon in fistula residual 2 cm fistula

18.10.09 operation: circ uvvf-repair vvf 7707

16.11.09 not leaking at all cath removed bladder drill

23.11 + 21.12 + 01.03 not leaking, incontinence +, miction healed, stress +

15.05.10 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

17.01.11 amenorrhea for 3 mth not leaking at all instructions

necrotic 3 cm
**bladder diameter**  
**26-2**  
24 cm  
**day 4**  

katsina  
cath 681  

**anal reflex neg and stool/flatus incontinence**  
**rvf**

zasd (katsina)  
**female**  
**15 yr**  
**19.04.00**

**diagnosis:**  
PI, overflow incontinence due to atonic bladder, **leaking urine/stool/flatus incontinence for 4 days** which started immediately following forceps delivery (15.04.00) bco obstructed labor of 3 days, in hospital sb male, married 2 yr ago pre(menarche 4 mth later), still living at husband, no menstruation, drop foot R (grade 2-3) and L (grade 1-2), no rvf, no yankan gishiri; normal ap diameter/public arch 85° referral

19/04-00 suprapubic mass, avw bulging into vagina, bladder overdistended (euro/bw 26 cm), poor elevation after draining > 1,500 ml urine, euro/b 2 cm (vesicalization) increased bladder capacity (longitudinal diameter 26-2 = 24 cm, **atonic bladder**)

anal reflex **neg**

29.05.00 not leaking at all cath removed bladder drill

05.06 + 19.06 + 07.08 not leaking, no incontinence healed, stress +

09.10.00 not leaking at all, no incontinence, normal miction flatus ok

insp/ healed, good elevation, stress incontinence **R=4 L=2-3**

**hypotonic bladder**
bladder diameter 25-1 24 cm
day 11
katsina cath 787
median perineum rupture/ar + with stool/flatus incontinence rvf
clav (katsina) female 14 yr 13.03.03
diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine/stool_flatus incontinence for 11 days that started immediately following obstructed labor 1 day, in hospital sb male, married 1 yr ago pre(menarche 3 mth later), not living with husband, no menstruation, drop foot R (grade 3) and L (grade 4), no rvf, no yankan gishiri; normal ap diameter /pubic arch 85°, anal reflex weakly pos, median perineum rupture + 6x3 cm awv necrosis at midline type IIb referral EOU/AVWN 1 cm, AVWN/C 0 cm 147.0 cm
13.03.03 suprapubic mass, awv bulging into vagina, bladder overdistended (euro/bw 25 cm), moderate elevation after draining > 2,000 ml of urine, euro/b 1 cm (vesicalization, not yet loss) increased bladder capacity (longitudinal diameter 25-1 = 24 cm, atonic bladder) will it heal since necrosis not deep?? poor position UV-junction against caudad third of symphysis
15.04.03 leaking insp/ fistula
18.04.03 operation (b/r_ab): uvvf-repair
13.05.03 not leaking at all cath removed bladder drill
09.06.03 not leaking at all, no incontinence, normal miction stools ok insp/ both healed, good elevation, no stress incontinence
23.10.03 not leaking at all, normal miction, stools ok both healed, no stress
02.12.04 amenorrhea for 3 mth not leaking at all instructions

6x3 cm
bladder diameter 25-2 23 cm
day 5
katsina cath 621
fabk (katsina) female 16 yr 17.08.98

diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 5 days (no spontaneous miction) that started immediately following obstructed labor for 3 days, in hospital sb female, married 2 yr ago post(menarche 10 mth earlier), still living at husband, no menstruation, drop foot R (grade 3) and L (grade 3) no rvf, no yankan gishiri; normal ap diameter/narrow pubic arch except for bulging no visible avw trauma 149.0 cm

17.08.98 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 25 cm), moderate elevation after draining >1,500 ml of urine, euo/b 2 cm (vesicalization) foley ch 18 increased bladder capacity (longitudinal diameter 25-2 = 23 cm, atonic bladder)

01.09.98 not leaking at all
02.10.98 not leaking at all cath removed bladder drill
10.11.98 not leaking at all, no incontinence, normal miction insp/healed, good elevation, no stress incontinence
14.12 + 09.02.98 idem
13.04.99 not leaking at all, no incontinence normal miction healed, no stress
09/11-99 amenorrhea for 4 mth not leaking at all instructions

hypotonic bladder
**bladder diameter**  
<table>
<thead>
<tr>
<th>24-0.5</th>
<th>23.5 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>day 20</td>
<td></td>
</tr>
</tbody>
</table>

katsina  
cath 1258

ssmj (katsina)  
female  
34 yr  
05.05.10

diagnosis: PXIV (7 alive), +2 cm 0 **necrotic** urethrovesicovaginal fistula type IIBa, **leaking urine for 20 days** which started immediately following obstructed labor for 2 days, in hospital sb female, married 23 yr ago pre(menarche 1 yr 7 mth later), **still** living with husband, no menstruation, drop foot R (grade 4) and L (grade 5), no rvf, no yankan gishiri, no h/o eclampsia; normal ap diameter/pubic arch 85°, ar slightly pos, no stool/flatus incontinence, no saddle anesthesia also **atonic bladder**

euo/f 0.1 cm, f/c 4 cm  
154.0 cm

05.05.10  
suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 24 cm), moderate anterior elevation after draining >2,000 ml urine, euo/b 0.5 cm (**vesicalization**)  
foley ch 18; free urine flow  
**increased** bladder capacity (longitudinal diameter 24-0.5 = 23.5 cm, **an atonic bladder**)  
poor position of uv-junction **against** caudad third of symphysis  
normal-width 0.5 cm poor-quality urethra_euo slightly pulled in side probably it will heal since necrosis not too deep

12.05.10  
not leaking at all  
documented **12.05 + 06.06**

06.06.10  
not leaking at all  
insp/ almost healed  
cath for 1 wk

14.06.10  
not leaking at all  
cath removed  
bladder drill

21.06.10  
not leaking at all, no incontinence, normal miction  
InsP/ healed, good elevation, no stress incontinence

19.07 + 20.09.10  
idem

18.10.10  
not leaking at all, no incontinence, normal miction  
healed, no stress
diagnosis: P III (2 alive), overflow incontinence due to atonic bladder with \( \pm 4 \text{ cm} \) superficial II Aa avw trauma midline/R, **leaking urine for 7 days** that started immediately following obstructed labor for 1 day, in hospital sb male, married 6 yr ago post-menarche 1 yr earlier, not living with husband, no menstruation, drop foot R (grade 3) and L (grade 4-5), no rvf, no yankan gishiri, no eclampsia; normal ap diameter/pubic arch 85°, ar pos euo/avwt 1.5 cm, avwt/c 2 cm referral 148.0 cm

10.09.09 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 24 cm), poor anterior elevation after draining 1,500 ml of urine, euo/b 1 cm *(vesicalization)* foley ch 18; free urine flow **increased** bladder capacity (longitudinal diameter 24-1 = 23 cm, **atonic bladder**) poor position of UV-junction **against** caudad third of symphysis normal-width 1 cm good-quality urethra_euo in anatomic position

23.09.09 not leaking at all

**documented 25.09 + 2.10**

26.10.09 not leaking at all cath removed bladder drill

01.11.09 not leaking at all, no incontinence, normal miction Insp/ healed, good elevation, no stress incontinence
bladder diameter 24-2 22 cm
day 8

continenence mechanism trauma without developing fistula
anal reflex neg and stool/flatus incontinence

shm (katsina) female 15 yr 25.01.00
diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 8 days
that started immediately following obstructed labor of 1 day, in hospital sb female, married 1 yr ago post(menarche 6 mth earlier), not at husband, no menstruation, drop foot R (grade 4), stool/flatus incontinence, no yankan gishiri; normal ap diameter/narrow pubic arch 75° also ± 6 cm 0

evrotic avw kees IIAa referral
euo/avwn 2 cm, avwn/c 0 cm

25.01.00 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/ bw 24 cm), moderate elevation after draining >1,500 ml of urine, euo/b 2 cm (vesicalization)
increased bladder capacity (longitudinal diameter 24-2 = 22 cm, atonic bladder)
acceptable position uv-junction against middle/caudad third symphysis
will it heal spontaneously since deep necrosis???

14.02 + 21.02 + 28.02 not leaking at all

06.03.00 not leaking at all cath removed bladder drill
23/03-00 not leaking at all, no incontinence, normal miction stools/flatus ok
insp/ healed, good elevation, no stress incontinence
bladder diameter 23-2 21 cm
day 9 + repeat
katsina cath 370
hmmj (katsina) female 15 yr 22.11.93
diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 9 days which started 1 day following obstructed labor for 2 days, in hospital live female, married 3 yr ago post(menarche 1 mth earlier), not with husband, no menstruation, no h/o drop foot, no rvf, episiotomy L broken 172.0 cm
22.11.93 suprapubic mass, aw bulging into vagina, bladder overdistended (euo/bw 23 cm), euo/b 2 cm, > 1.5 liter urine foley ch 18
27.12.93 not leaking at all cath removed bladder drill
25.01.94 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
01.03.94 idem
18.12.95 not leaking at all, no incontinence, normal miction healed, no stress
09/05-96 amenorrhea for 7 mth not leaking at all instructions
16.08.96 foley ch 18 for 6 wk cath aafaa
24.09.96 not leaking at all cath removed bladder drill
15.10.96 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence

hypotonic bladder
diagnosis: PI, overflow incontinence due to atonic bladder, **leaking urine for 1 day** which started immediately following obstructed labor for <1 day, at home sb male, married 1.5 yr ago pre(menarche 4 mth later), still living at her husband, no menstruation, drop foot R (grade 4), no rvf; narrow pubic arch, no yankan gishiri

07.11.96 suprapubic mass, awv bulging into vagina, bladder overdistended (euo/bw 22 cm), good elevation after draining >1,000 ml urine, euo/b 2 cm increased bladder capacity (longitudinal diameter 22-2 = 20 cm, **atonic bladder**)

12.12.96 not leaking at all cath removed bladder drill
23.01.97 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
21.03.97 idem
22.05.97 not leaking at all, no incontinence, normal miction healed, no stress
bladder diameter 21-1 20 cm
day 3

katsina cath 1838
anterior/posterior rvf

rbldk (katsina) female 28 yr 15.01.18
diagnosis: PVII (5 alive), overflow incontinence due to hypotonic bladder, 2° perineum tear, leaking urine/flatus incontinence for 3 days which started immediately following last labor for < 1 days, at home live female, married 15 yr ago pre (menarche 2 mth later), still living with husband, menstruation no, no foot drop R (grade 5) and L (grade 5), no rvf, no yankan gishiri, no eclampsia; normal ap diameter/wide pubic arch 95°, ar pos except for bulging no visible avw trauma 160 cm 50 kg

15.01.18 objective incontinence +; suprapubic mass, avw bulging into vagina, bladder overdistended, euo/bw 21 cm, poor anterior elevation after draining > 2,500 ml, euo/b 1 cm foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 21-1 = 20 cm) normal-width 1 cm good-quality urethra_euo in anatomic position

12.02.18 not leaking at all cath removed bladder drill
19.02.18 not leaking at all, no incontinence, normal miction perineum healed insp/ healed, poor elevation, no stress incontinence
14.03 + 14.05.18 idem flatus ok
09.07.18 not leaking at all, no incontinence, normal miction healed, no stress
bladder diameter 22-3.2 | 19 cm

day 50  

kano  
cath 1022  

atypical: leaking started after 4 days, excellent elevation, euo/b 3.2 cm

zubaida yahaya kademi (kano)  
female  
38 yr  
01.08.19  

diagnosis:  
PX (3 alive), overflow incontinence due to hypotonic bladder, **leaking urine of 50 days which started 4 days** following obstructed last labor for few hours, in hosp, sb male, married 25 yr ago pre(menarche 2 mth later), still living with husband, no menstruation, no drop foot R (grade 6) and L (grade 5), no rvf, no yankan gishiri, no eclampsia; normal ap diameter/pubic arch 90°, ar **pos** cervix mobile  
no visible avw trauma, not even bulging but excellent elevation

01.08.19  
suprapubic mass, excellent anterior elevation; bladder overdistended, euo/bw 22 cm, excellent elevation after draining > 2,500 ml urine, euo/b 3.2 cm  
foley ch 18; free urine flow  
**increased** bladder capacity (longitudinal diameter 22-3.2 = 19 cm)  
normal-width 3 cm good–quality urethra_euo in anatomic position

21.08.19  
not leaking at all  
cath removed  
bladder drill

22.09.19  
not leaking at all, no incontinence, normal miction  
insp/ healed, excellent elevation, no stress incontinence

hypotonic bladder
diagnosis: PI, overflow incontinence due to an atonic bladder, $\pm$ 4 cm necrotic ure throvesicovaginal "fistula" IIa, leaking of urine for 5 days which started immediately following obstructed labor for 3 days, in hospital a sb female, married 1 yr ago post(menarche 8 mth earlier), not living at her husband, no menstruation, drop foot R (grade 4) and L (grade 4), 3° perineum rupture without sphincter ani rupture, no rvf, no yankan gishiri; wide pubic arch 95° referral euo/"f" 2 cm, "m"/c 4 cm

19.12.98 suprapubic mass, avw bulging into vagina, bladder overdistended (evo/bw 21 cm), poor elevation after draining > 1,500 ml urine, evo/b 2 cm (vesicalization not loss) increased bladder capacity (longitudinal diameter 21-2 = 19 cm, atonic bladder)

13/1-99 not leaking at all insp/ avw healing, no fistula; perineum ok

01.02.99 not leaking at all cath removed bladder drill
18.03.99 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
11.04 + 11.05.99 idem
03.06.99 not leaking at all, no incontinence, normal miction healed, no stress
16/10-02 amenorrhea for 3 mth not leaking at all instructions
bladder diameter 20-1 19 cm
mth 3
kano
cath 1012
anterior; hypotonic bladder
radd (kano city) female 21 yr 18.02.18
diagnosis: PII (all alive), overflow incontinence due to hypotonic bladder, leaking urine for 3 mth which started immediately following obstructed last labor for 1 day, in hospital live female, married 4 yr ago post(menarche 4 yr earlier), still living with husband, no menstruation, drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri, eclampsia no; normal ap diameter/wide pubic arch 90°, ar pos bulging hyperemic avw 156 cm
18.02.18 suprapubic mass, avw bulging into vagina; bladder overdistended, euo/bw 20 cm, poor anterior elevation after draining >1,500 ml urine, euo/b 1 cm, foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 20-1 = 19 cm) normal-width 1 cm good-quality urethra_euo in anatomic position
11.03 + 18.03.18 not leaking at all cath removed bladder drill
09.04.18 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence
21.06.18 not leaking at all, no incontinence, normal miction healed, no stress
bladder diameter 20-2 18 cm
day 7 katsina cath 545
hypotonic bladder with necrotic avw trauma; no fistula formation

sgdf (katsina) female 22 yr 12.12.96
diagnosis: PIV (2 alive), overflow incontinence due to atonic bladder with ± 4 cm 0 necrotic avw kees IIa, leaking urine of 7 days that started 1 day after obstructed last labor for 2 days, in hospital sb male, married 10 yr ago pre(menarche 1 yr later), not living at husband, no menstruation, drop foot R (grade 3) and L (grade 2) no rvrf, no h/o yankan gishiri; normal pubic arch; poor general condition, pat cannot walk/stand without support
euo/avwn 2 cm, avwn/c 4 cm 152.0 cm

12.12.96 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 20 cm), no elevation after draining of >1,500 ml urine, euo/b 2 cm (vesicalization); foley ch 18 will it heal spontaneously?
iincreased bladder capacity (longitudinal diameter 20-2 = 18 cm, atonic bladder)

18.12.96 necrotic tissue removed debridement
24.12.96 not leaking at all condition better
10.01.97 not leaking at all insp/ seems healing

29.01.97 not leaking at all no fistula; cath removed, bladder drill!
04.02.97 not leaking at all, no incontinence, normal miction insp/ avw not completely healed, no stress incontinence, moderate elevation condition o.k.
12.03.97 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
18.08.97 not leaking at all, no incontinence, normal miction healed, no stress

16.11.99 amenorrhea for 3 mth not leaking at all instructions

necrotic 4 cm 0
diagnosis: PI, + 3 cm 0 necrotic urethrovesicovaginal fistula IIbA and overflow incontinence due to atonic bladder, leaking of urine for 9 days that started immediately following obstructed labor for 2 days in hospital (eclampsia) sb male, married 2 yr ago pre(menarche 1 mth later), not living with husband, no menstruation, drop foot R (grade 4) and L (grade 3), no rvf, no yankan gishiri; normal ap diameter/pubic arch 85° referral

euo/f 1 cm, f/c 6 cm

23.09.01 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 19 cm), moderate elevation after draining > 1,500 ml of urine, euo/b 1 cm (vesicalization) anal reflex + increased bladder capacity (longitudinal diameter 19-1 = 18 cm, atonic bladder) stool_flatus incontinence poor position of UV-junction against caudad third of symphysis probably it will not heal since deep necrosis

04.11.11 not leaking at all cath removed bladder drill

14/11-01 repeat atonic bladder ch 18 for 6-8 wk catheter
13.01.02 not leaking at all cath removed bladder drill

20.01.02 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

04.03 + 23.06.02 idem
18.08.02 not leaking at all, no incontinence, normal miction healed, no stress
Bladder diameter: 19-1.5 cm, 17.5 cm

Day 13

Katsina, Cath 711

MDJ (Katsina), Female, 14 yr, 26.02.01

Diagnosis: PI, overflow incontinence due to atonic bladder, + 2x1 cm deep AVW trauma, leaking urine (no spontaneous miction) for 13 days which started immediately following forceps delivery b.c.o. obstructed labor of 1 day, SB male, married 2 yr ago pre-menarche 8 mth later, not living with husband, no menstruation, drop foot R (grade 4) and L (grade 2), no RVF, no yankan gishiri; normal AP diameter/pubic arch 85°, open episiotomy at R anus referral
euo/AVWT 6 cm, AVWT/c 2 cm 155.0 cm

26.02.01 suprapubic mass, AVW bulging into vagina, bladder overdistended (euro/bw 19 cm), moderate elevation after draining 750 ml urine, euro/b 1.5 cm (vesicalization) anal reflex pos increased bladder capacity (long diameter 19-1.5 = 17.5 cm, an atonic bladder)

Poor position of UV-junction against caudad third of symphysis

10.04.01 not leaking at all cath removed bladder drill
16.04.01 not leaking at all, no incontinence, normal miction
insp/healed, good elevation, no stress incontinence
14.05.01 not leaking at all, no incontinence, normal miction healed, no stress
The document contains a case report of a female patient with the diagnosis of Post-Vaginal II (PVII) incontinence due to a partially obstructed labor, leading to an atonic bladder and overflow incontinence. The patient, a 41-year-old female, was admitted on August 03, 2000, with symptoms of leaking urine for 14 days after obstructed labor. The bladder was overdistended, with increased bladder capacity and vesicalization. The patient was followed up with catheterization, and the bladder drill procedure was done. The symptoms of incontinence were improved with good elevation and no stress incontinence. The patient's conditions were reviewed on September 13, 2000, and the catheter was removed. The patient continued to improve with normal micturition and healing. The patient was discharged on April 09, 2001, with no stress incontinence and healing. The diagnosis included an atonic bladder with poor position of the urethra-vesical junction and no yankan gishiri.
bladder diameter  18-1  17 cm

day 53

kano
cath 691
rvf

? obstetric pressure trauma to sacral plexus?

ssuu (kano city)  female  21 yr  09.02.04

diagnosis: PII (0 alive), overflow incontinence due to an atonic bladder, leaking urine/stool_flatus incontinence for 53 days which started immediately following vcs bco obstructed last labor for 2 days, sb female, married 2 yr ago post(menarche 6 yr earlier), still living with husband, no menstruation, drop foot R (grade 2-3) and L (grade 3-4), no yankan gishiri; normal ap diameter/ pubic arch 85°, ar neg, no saddle anesthesia

09.02.04 small suprapubic mass, avw "bulging" into vagina, bladder overdistended (euo/bw 18 cm) and moderate elevation after draining > 750 ml urine, euo/b 1 cm (vesicalization) foley ch 18 increased bladder capacity (longitudinal diameter 18-1 = 17 cm, atonic bladder)
poor position UV-junction against caudad third symphysis

07.03 + 21.03.04 not leaking at all cath removed bladder drill
04.04.04 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
06.06.04 idem
18.07.04 not leaking at all, no incontinence, normal miction healed, no stress
**bladder diameter** 18-2 16 cm
**day 27**

katsina cath 699

**sab (jigawa)** female 19 yr 10.10.00

**diagnosis:** PI, overflow incontinence due to atonic bladder, **leaking urine for 27 days** which started immediately following obstructed labor for 7 days, in hospital sb male, married 7 yr ago pre(menarche 1 yr later), not living with husband, no menstruation, no rvf, drop foot R (grade 4) and L (grade 2), no yankan gishiri; normal ap diameter/narrow pubic arch 75°, also **healed transverse avw scar**, no flatus incontinence

euo/avws 2 cm, avws/f 8 cm 151.0 cm

10.10.00 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 18 cm), poor elevation after draining > 750 ml urine, euo/b 2 cm (**vesicalization**) increased bladder capacity (longitudinal diameter 18-2 = 16 cm, **atonic bladder**) anal reflex ± acceptable position UV-junction **against** middle/caudad third symphysis

20.11.00 not leaking at all cath removed bladder drill

27.11.00 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

17.01.01 idem

20.03.01 not leaking at all, no incontinence, normal miction healed, no stress

11/11-01 **amenorrhea for 4 mth** not leaking at all **instructions**
**bladder diameter**

| 17-1.7 | 15.5 cm |

mth 3

zaria  
cath 97  
rvf

**sacral plexus trauma??**

hmk (kaduna)  
female  
14 yr  
23.01.13

diagnosis:  
PI (0 alive), either overflow incontinence due to atonic bladder or total genuine incontinence, leaking urine + no spontaneous miction for 3 mth which started immediately following cs bco obstructed labor for 3 days (1 day hosp), sb female, married 2 yr ago pre(menarche 1 yr later), not living with husband, menstruation 1x, drop foot R (grade 3) and L (grade 5), no rvf, no yankan gishiri, no eclampsia; normal ap diameter/pubic arch 85°, cervix retracted/fixed midline, distal lpl stricture/vagina stenosis due to epi L, otherwise vagina ok, ar pos continuous urine thru euo, i/v 13 cm on & off flatus incontinence

23.01.13  
**under spinal anesthesia:**

small suprapubic mass, except for bulging no visible avw trauma, gv/ no leakage,, euo/bw 17 cm, moderate anterior elevation after draining > 500 ml, avw_bladder like .loose sac, euo/b 1.7 cm foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 17-1.7 = 15.5 cm, an atonic bladder) poor position of uv-junction against caudad third of symphysis normal-width 1.5 cm good–quality urethra_euo in anatomic position

04.03.13 not leaking at all  
cath removed  
bladder drill

10.03.13 not leaking at all, no incontinence, normal miction  
flatus ok  
insp/ healed, good elevation, no stress incontinence

15.04.13 not leaking at all, no incontinence, normal miction  
healed, no stress
**bladder diameter**  17-2  15 cm  
**day 31**

katsina  cath 599

rlyc (kano)  female  16 yr  08.02.98

diagnosis: PI, overflow incontinence (no spontaneous miction) due to atonic bladder, **leaking urine for 31 days** which started immediately following obstructed labor for 1 day, in hospital (8/1-98) sb **hydrocephalic** male, married 4 yr ago pre(menarche 1 yr later), not living at husband, no menstruation, drop foot R (grade 2-3) and L (grade 2-3), no rvf, no yankan gishiri; normal apdiameter/pubic arch, also ± 0.5 cm avw trauma type I at L

euo/avwt 8 cm, avwt/c 2 cm  149.0 cm

**anesthesia:** spinal L4/L5 with 4 ml bupivacaine 0.5%

08.02.98  100 ml gv check: no leakage

small suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 17 cm), moderate elevation after draining 500 ml urine, euo/b 2 cm (**vesicalization**)  
**increased** bladder capacity (longitudinal diameter 17-2 = 15 cm, **atonic bladder**)  
poor position UV-junction **not against** middle/caudad third symphysis

30.03.98  not leaking at all  cath removed  bladder drill
06.04 + 26.04 + 24.05.98  not leaking, incontinence +  insp/ healed, stress+
03/08-98  not leaking, incontinence +, normal miction

insp/ healed, good elevation, no stress incontinence whatsoever

RR

preanesthesia:  140/100 mm Hg
5":  130/90
10":  120/80
postoperation:  100/70
**bladder diameter** 16-1 15 cm
day 21
katsina cath 670
asyd (katsina) female 17 yr 31.01.00

**diagnosis:** PI, overflow incontinence due to atonic bladder, **leaking urine for 21 days** which started immediately following obstructed labor for 1 day, in hospital sb male, married 3 yr ago post(menarche 1 yr earlier), not living at her husband, no menstruation, drop foot R (grade 4) and L (grade 4), no rvf, no yankan gishiri; a normal ap diameter/borderline pubic arch 80°, **avw totally indurated**, no stool/flatus incontinence referral 162.5 cm

31.01.00 suprapubic mass, avw bulging into vagina, bladder overdistended (euro/bw 16 cm), poor elevation after draining 750 ml of urine, euro/b 1 cm (**vesicalization**)
increased bladder capacity (longitudinal diameter 16-1 = 15 cm, **atonic bladder**)
anal reflex ±
poor position of UV-junction against caudad third of symphysis

13.03.00 not leaking at all cath removed bladder drill
02.04.00 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
07.05.00 idem
19.07.00 not leaking at all, normal miction insp/ healed, no stress R=5 L=4
12.11.00 amenorrhea for 4 mth not leaking at all instructions
**bladder diameter**

<table>
<thead>
<tr>
<th>Date</th>
<th>Diameter</th>
<th>Day</th>
</tr>
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<tbody>
<tr>
<td>35</td>
<td>16-1.5</td>
<td>14.5 cm</td>
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**katsina**

**cath 969**

**ssat (katsina city)**

**female**

**15 yr**

**03.05.06**

**diagnosis:** PI (0 alive), overflow incontinence due to atonic bladder, **leaking urine for 35 days** which started immediately following obstructed labor for 2 days, in hospital sb female, married 2 yr ago pre(menarche 4 mth later), not living with husband, no menstruation, no (h/o) drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri; normal ap diameter/pubic arch 85°, avw totally indurated

03.05.06 small suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 16 cm), moderate anterior elevation after draining > 700 ml urine, euo/b 1.5 cm (**vesicalization**) increased bladder capacity (longitudinal diameter 16-1.5 = 14.5 cm) poor position of uv-junction against caudad third of symphysis

11.06.06 not leaking at all cath removed bladder drill

10.07.06 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

04.09 + 30.10.06 idem

12.12.06 not leaking at all, no incontinence, normal miction R=5 L=5 insp/ healed, good elevation, no stress incontinence AR pos

14.08.09 amenorrhea for 3 mth not leaking at all instructions

hypotonic bladder
bladder diameter 16-2 14 cm
day 21
kano
cath 744
zbq (kano city) female 35 yr 10/10-05
diagnosis: PI (0 alive), total urine intrinsic_stress incontinence as healing phase of atonic bladder, **leaking urine for 21 days** which started immediately following obstructed labor for 2 days (spent 4 days in hospital awaiting elective cs as elderly primigravida), mmsh vaginal delivery sb male, married 21 yr ago post(menarche 1 yr earlier), still living with husband, no menstruation, no (h/o) drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri; normal ap diameter/pubic arch 85°, ar pos 152.0 cm

10.10.05 **objective** intrinsic_stress incontinence; foley ch 18; free urine flow, euo/bw 16 cm, moderate anterior elevation (poor support), euo/b 2 cm (**vesicallization**) **increased** bladder capacity (longitudinal diameter 16-2 = 14 cm, **atonic bladder in healing phase**) acceptable position uv-junction **against** middle/caudad third symphysis

20.11.05 not leaking at all cath removed bladder drill
15.12.05 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
26.02.06 not leaking at all, no incontinence, normal miction healed, no stress

hypotonic bladder
bladder diameter 15-1 14 cm
day 65
katsina cath 650
anal reflex + and flatus incontinence rfv
mmg (katsina) female 22 yr 14.07.99
diagnosis: P III (1 alive), overflow incontinence due to atonic bladder or stress incontinence grade III, leaking urine for 65 days which started immediately following a cs laparotomy (10/5-99) b.c.o. ruptured uterus due to obstructed last labor of 1 day, sb male, married 9 yr ago pre(menarche 3 mth later), not living with husband, no menstruation, drop foot R (grade 1) and L (grade 4-5), no rfv (but flatus incontinence), no yankan gishiri; normal ap diameter/narrow pubic arch 70° referral 151.0 cm

14.07.99 no suprapubic mass, poor elevation (but avw not bulging), bladder overdistended (euo/bw 15 cm), bladder not overfilled, euo/b 1 cm (vesicalization) gv: overflow!! foley ch 18 increased bladder capacity (longitudinal diameter 15-1 = 14 cm, ?? atonic bladder??) anal reflex +

06.09.99 not leaking at all cath removed bladder drill
13.09.99 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
27.09.99 idem flatus ok
25.10.99 not leaking at all, no incontinence, normal miction healed, no stress

? hypotonic bladder?
**bladder diameter**  
16-2.5  
13.5 cm  

**day 30**  
katsina  
cath 484  

**atonic bladder in spontaneous healing phase**  
ria (rép niger)  
female  
39 yr  
04.10.95  

**diagnosis:** P XI (8 alive), overflow incontinence due to atonic bladder with *leaking urine for 30 days* that started immediately following an obstructed labor of 2 days (also micturition), in hospital sb male, married 25 yr ago post(menarche 6 mth earlier), still living with husband, no menstruation, drop foot R (grade 3) and L (grade 3), no rvf; normal pubic arch, no avw trauma  

04.10.95  
small suprapubic mass, avw bulging into vagina, bladder overdistended with euo/bw 16 cm, moderate elevation after draining >500 ml urine, euo/b 2.5 cm  
increased bladder capacity (long diameter 16-2.5 = 13.5 cm)  

15.11.95  
not leaking at all  
cath removed  
bladder drill  

22/11-95  
not leaking at all, no incontinence, normal miction  
insp/ healed, moderate elevation, no stress incontinence
bladder diameter 15-2 13 cm
day 33
katsina cath 340

bhz (katsina) female 16 yr 18.06.93
diagnosis: PII (1 alive), overflow incontinence due to bladder atony, leaking urine for 33 days which started immediately following obstructed last labor for 2 days, at home stillborn male infant, married 4 yr ago pre(menarche 3 mth later), still living with husband, no menstruation, drop foot R (grade 4), no rvf
pat cannot pass urine herself, at night only slight leaking, no avw trauma, soft suprapubic mass, avw bulging into vagina, euo/bw 15 cm, draining >1 liter of urine, euo/b 2 cm
18.06.93 foley ch 18 for 4 wk
26.07.93 not leaking at all insp_gv/ no fistula cath removed
12.08.93 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence
11.09.93 idem
22.11.93 not leaking at all, no incontinence, normal miction healed, no stress
02.07.94 amenorrhea for 5 mth not leaking at all instructions

second obstetric leakage
28.05.97 PIV (3 alive), leaking urine once in a while for 44 days which started immediately following obstructed last labor for 2 days, in hospital live male; normal pubic arch
insp/ no fistula but stress incontinence + only on heavy strain bladder drill cath aafab
07.06.97 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence
evidence-based practice

clinical science
excellent final healing rate

development hypotonic bladder
into
genuine urine incontinence
hypotonic bladder into genuine incontinence  
bladder diameter 14 cm  
katsina  
cath 1931  
?spontaneous healing phase of hypotonic bladder?  
smyt (katsina)  
female  
18 yr  
22.01.19  
diagnosis:  
PI (0 alive), total postpartum genuine incontinence as ?healing phase of hypotonic bladder?, leaking urine for 9 days which started immediately following obstructed labor for 2 days, in hosp sb female, married 1 yr ago post(menarche 4 yr earlier), not living with husband, no menstruation, no foot drop R (grade 5) and L (grade 5), no rvf, no yankan gishiri, eclampsia no; normal ap diameter/wide pubic arch 90°, ar pos except for bulging no visible avw trauma  
22.01.19  
objective  
stress ++; foley ch 18; free urine flow, euo/bw 15 cm, poor anterior elevation, euo/b 1 cm  
threatensitional  
bladder capacity (longitudinal diameter 15-1 = 14 cm)  
normal-width 1 cm good-quality urethra_euo in anatomic position  
19.02.19  
not leaking at all  
cath removed  
bladder drill  
26.02.19  
not leaking at all, no incontinence, normal miction  
insp/ healed, good elevation, no stress incontinence  
26.03 + 21.05.19  
idem  
16.07.19  
not leaking at all, no incontinence, normal miction  
healed, no stress  

100
hypotonic bladder into genuine incontinence
day 56
bladder diameter 15-1 = 14 cm
katsina
cath 987
transition hypotonic bladder into genuine incontinence
rvf

mam (kaduna) female 18 yr 20.06.06

diagnosis: PI (0 alive), total urine intrinsic_stress incontinence, leaking urine for 56 days which started immediately following obstructed labor for 1 day, in hospital sb male, married 2 yr ago post(menarche 3 yr earlier), not living with husband, no menstruation, no (h/o) drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri; normal ap diameter/pubic arch 85°, ar minimally pos with only saddle anesthesia at R, never stool_flatus incontinence, no avw trauma

20.06.06 no suprapubic mass but avw bulging into vagina, foley ch 18; free urine flow, euo/bw 15 cm, poor anterior elevation, euo/b 1 cm (vesicalization) normal-increased bladder capacity (longitudinal diameter 15-1 = 14 cm) poor position uv-junction against caudad third symphysis

18.07.06 not leaking at all cath removed bladder drill
22.07.06 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
05.09.06 idem
24.11.06 not leaking at all, no incontinence, normal miction R=5 L=5 insp/ healed, good elevation, no stress incontinence AR pos
07.07.07 amenorrhea for 3 mth not leaking at all instructions

total incontinence
hypotonic bladder into genuine incontinence mth 6
bladder diameter 12-1 = 11 cm
from atonic bladder into urine stress incontinence

cath 17

hmb (kano) female 32 yr 05.11.90

diagnosis: PVII (3 alive), overflow incontinence due to atonic bladder, leaking urine for 3 wk which started 7 days following obstructed last labor for 1 day, at home live female, married 20 yr ago pre(menarche 1 yr later), still living with husband, no h/o drop foot; bladder totally overfilled

05.11.90 foley ch 18 for 4 wk

urine stress incontinence grade II euo/bw 12 cm euo/b 1 cm

08.04.91 operation: colposuspension vvf 238
08.05.91 not leaking at all cath removed bladder drill
22.05.91 not leaking at all, no incontinence, normal miction
insp/ healed, good elevation, no stress incontinence
19.06.91 idem
19.09.91 not leaking at all, no incontinence, normal miction
hypotonic bladder into genuine incontinence  
mth 6
bladder diameter from 18-1 = 17 cm  to  12-1 = 11 cm
katsina

cath 988
rvf aaiax

umm (katsina)  
female  14 yr  26.06.06

diagnosis:  PI (alive), overflow incontinence due to atonic bladder, leaking urine for 32 days which started immediately following obstructed labor for 6 days, in hospital (eclampsia 25.05.06 live female, married 1 yr = 14 mth ago pre (menarche 2 mth later), not living with husband, no menstruation, drop foot R (grade 4-5) and L (grade 4-5), no RVF, no yankan gishiri; normal AP diameter/pubic arch 90°, ar slightly pos, no saddle anesthesia but flatus incontinence only, except for bulging no visible avw trauma  146.0 cm

26.06.06  suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 18 cm), moderate anterior elevation after draining >1,500 ml urine, euo/b 1 cm (vesicalization) foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 18-1 = 17 cm, atonic bladder) poor position of UV-junction against caudad third of symphysis

07.08 06  not leaking at all  cath removed  bladder drill
10.09.06  not leaking at all, incontinence +, normal miction  R =5 L =5 
insp/ healed, good elevation, no stress incontinence  ar pos
02.11.06  incontinence ++  euo/bw 12 cm  euo/b 1 cm  flatus ok

04.11.06  operation: urethralization_pcf fixation  vvf 6923
04.12.06  not leaking at all  cath removed  bladder drill
12.12.06  not leaking at all, no incontinence, normal miction  
insp/ healed, good elevation, no stress incontinence
08.03.07  idem
23.05.07  not leaking at all, no incontinence, normal miction  healed, no stress

atonic bladder
hypotonic bladder into genuine incontinence mth 6
bladder diameter 12-1 = 11 cm
                katsina
median defect ep fascia
                vvf 6923
genuine intrinsic incontinence
                cath 988
rfv

unm (katsina)         female   14 yr   04.11.06

surgeon: kees waaldijk
assistant: kabir lawal
diagnosis: PI (alive), post atonic bladder total urine intrinsic_stress incontinence,
leaking urine whilst lying/sitting/standing/walking + spontaneous miction
for 5.5 mth which started immediately following obstructed labor for 6
days, in hospital (eclampsia 25/5-06) live female, married 19 mth ago
pre(menarche 2 mth later), not living with husband, no menstruation
(breast feeding), drop foot R (grade 5) and L (grade 5), no rfv; normal ap
diameter/pubic arch 90°, ar pos, no longer flatus incontinence
euo/c 8 cm open 1 urethra_EUO 148.0 cm
euo/bw 12 cm, poor elevation no support, euo/b 1 cm (vesicalization)
operation: urethralization and bilateral paraurethra fixation of ep fascia
duration: 20 min       continence 90%
anesthesia: spinal L4/L5 with 3 ml bupivacaine 0.5%

urine level in urethra in accord with respiration
episiotomy L, transverse curved incision at 1.5 cm from EUO, sharp dissection,
both paravesical spaces not opened, raphy of urethra_fascia at 0-4 cm from EUO by
serafit, bilateral paraurethra fixation of ep fascia onto ATF by serafit by 2x serafit each
side, now EUO/B 3 cm, no urine thru EUO on rest/cough/pressure, triple fixation of
FOLEY Ch 18, transverse avw adaptation by 2x everting seralon, skin closure, pack;
free urine flow, EUO/BW 12 cm, good elastic anterior elevation, EUO/B 3 cm
normal bladder capacity (longitudinal diameter 12-1/3 = 11/9 cm) good fascia plate
good-quality urethra_fascia, good position UV-junction against middle third symphysis
normal-width 3 cm good-quality urethra_EUO in anatomic position
04.12.06 not leaking at all cath removed bladder drill
12.12.06 not leaking at all, no incontinence, normal miction
so
insp/ healed, good elevation, no stress incontinence
08.03 idem
23.05.07 not leaking at all, no incontinence, normal miction  healed, no stress

RR
preanesthesia: 140/90 mm Hg
5': 130/80
10': 120/70
postoperation: 120/70
evidence-based practice

clinical science

excellent final healing rate

long-standing hypotonic bladder

duration

72 days
3 mth
4 mth
5 mth
7 mth
10 mth
2 yr
hypotonic bladder long-standing + sphincter ani rupture
day 72

katsina
cath 600
rvf

hsug (rép niger) female 27 yr 11.02.98
diagnosis: PVI (3 alive), overflow incontinence due to an atonic bladder, sphincter ani rupture with rectovaginal fistula, leaking urine (no spontaneous miction)/stools_flatus incontinence for 72 days that started immediately following an obstructed last labor for < 1 day, in hospital sb female, married 15 yr ago pre(menarche 1 yr later), still living at her husband, no menstruation, drop foot R (grade 4) and L (grade 3), no yankan gishiri; normal ap diameter/public arch, healed 0.2 cm 0 avw lIaAa trauma midline

euo/avwt 4 cm, avwt/c 7 cm 148.0 cm

11.02.98 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 19 cm), moderate/good elevation after draining > 500 ml urine, euo/b 2 cm (vesiculization is reducing) foley ch 18
increased bladder capacity (longitudinal diameter 19-2 = 17 cm, atonic bladder)
uv-junction not against (rotational descent) middle third of symphysis

30.03.98 not leaking at all cath removed bladder drill
06.04.98 not leaking at all, no incontinence, normal miction
insp/ healed, good elevation, no stress incontinence
**hypotonic bladder long-standing**

MTH 3

Zaria

?? Sacral plexus trauma??

Hasiya Muhammad Kaura (Kaduna)

Female 14 yr 23.01.13

Diagnosis: PI (0 alive), either overflow incontinence due to atonic bladder or total genuine incontinence, leaking urine + no spontaneous miction for 3 mth which started immediately following CS bco obstructed labor for 3 days (1 day hosp), sb female, married 2 yr ago pre(menarche 1 yr later), not living with husband, menstruation 1x, drop foot R (grade 3) and L (grade 5), no rvf, no yankan gishiri, no eclampsia; normal ap diameter/pubic arch 85°, cervix retracted/fixed midline, distal lpl stricture/vagina stenosis due to epi L, otherwise vagina ok, ar pos continuous urine thru euo, i/v 13 cm on & off flatus incontinence

23.01.13 under spinal anesthesia:
small suprapubic mass, except for bulging no visible avw trauma, gv/ no leakage, , euo/bw 17 cm, moderate anterior elevation after draining > 500 ml, avw bladder like loose sac, euo/b 1.7 cm foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 17-1.7 = 15.5 cm, an atonic bladder)
poor position of uv-junction against caudad third of symphysis normal-width 1.5 cm good-quality urethra euo in anatomic position

04.03.13 not leaking at all cath removed bladder drill
10.03.13 not leaking at all, no incontinence, normal miction flatus ok insp/ healed, good elevation, no stress incontinence
15.04.13 not leaking at all, no incontinence, normal miction healed, no stress
hypotonic bladder long-standing

kano

anterior; hypotonic bladder

cath 1012

radd (kano city) female 21 yr 18.02.18

diagnosis: PII (all alive), overflow incontinence due to hypotonic bladder, leaking urine for 3 mth which started immediately following obstructed last labor for 1 day, in hospital live female, married 4 yr ago post (menarche 4 yr earlier), still living with husband, no menstruation, drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri, eclampsia no; normal ap diameter/wide pubic arch 90, ar pos bulging hyperemic avw

156 cm

18.02.18 suprapubic mass, avw, avw bulging into vagina; bladder overdistended, euo/bw 20 cm, poor anterior elevation after draining > 1,500 ml urine, euo/b 1 cm foley ch 18; free urine flow increased bladder capacity (longitudinal diameter 20-1 = 19 cm) normal-width 1 cm good-quality urethra_euo in anatomic position

11.03 + 18.03.18 not leaking at all cath removed bladder drill

09.04.18 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence

21.06.18 not leaking at all, no incontinence, normal miction healed, no stress
hypotonic bladder long-standing

katsina
cath 358

ham (rép niger)
female 16 yr 16.09.93

diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 4 mth which started immediately following obstructed labor for 3 days, at home sb male, married 6 yr ago pre(menarche 1.5 yr later), not with husband, normal menstruation, drop foot R for 3 mth (still grade 4), no rvf; trans verse avw scar with granulation at 2.5 cm from EUO
euo/avws 2.5 cm 151.0 cm

16.09.93 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 18 cm), euo/b 3 cm, > 1.5 liter urine foley ch 18

14.10.93 cath out x 1 day not leaking at all, no incontinence, normal miction
Insp/ no incontinence, avw granulations

27.10.93 not leaking at all, no incontinence, normal miction
insp/ healed, moderate good elevation, no stress incontinence

27.11 + 06.02 idem

05.02-94 not leaking at all, no incontinence, normal miction healed, no stress

06/11-94 amenorrhea for 3 mth not leaking at all instructions
hypotonic bladder long-standing

cath 731

mth 4

kano

wbsm (kano) female female 15 yr 07.06.05

diagnosis: PI (0 alive), overflow _intrinsic_ stress incontinence due to atonic bladder ?in healing phase?, leaking urine for 4 mth which started immediately following obstructed labor for 2 days, in hospital sb female, married 2 yr ago pre(menarche 3 mth later), not living with husband, no menstruation, drop foot R (grade 5) and L (grade 5), no rvf, no yankan gishiri; normal ap diameter/public arch 90°, ar negative with full bladder and slightly pos after draining bladder, no saddle anesthesia, never stool _flatus_ incontinence, no avw trauma

objective overflow _intrinsic_ stress incontinence 155.0 cm

07.06.05 small suprapubic mass, avw ∡ bulging into vagina, bladder overdistended (euo/bw 19 cm), moderate anterior elevation after draining > 600 ml of urine, euo/b 2 cm foley ch 18 for 6 wk increased bladder capacity (longitudinal diameter 19-2 = 17 cm, atonic bladder ?in healing phase?) acceptable position UV-junction not against middle third symphysis

03.07 + 10.07 + 17.07.05 not leaking at all cath removed bladder drill

07.08.05 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence

28.08.05 not leaking at all, no incontinence, normal miction healed, no stress
**hypotonic bladder long-standing**

**katsina**

**mth 5**

huk (katsina) female 16 yr 18.05.96

**diagnosis:** PI, **atonic bladder** with overflow incontinence, leaking urine of 5 mth! which started immediately following obstructed labor for 1 day, in hospital an sb male, married 3 yr ago post(menarche 3 mth earlier), not living with her husband, normal menstruation, drop foot R (grade 4) and L (grade 4) and no rvf; narrow pubic arch 148.5 cm

18.05.96 suprapubic mass, avw bulging into vagina, bladder overdistended (euro/bw 15 cm), moderate elevation after draining > 1,000 ml of urine, euro/b 2 cm increased bladder capacity (longitudinal diameter 15-2 = 13 cm, **atonic bladder**)

31.05.96 not leaking at all cath removed bladder drill

06.06.96 not leaking, incontinence + insp/ healed, no stress bladder drill

20.06.96 idem

27/07-96 not leaking, incontinence ++, normal miction insp/ healed, good elevation, no stress incontinence whatsoever
hypotonic bladder long-standing

katsina
cath 423

atonic bladder for 7 mth; no self-limiting condition??
catheter for at least 6-8 weeks

hsdd (katsina)  female  17 yr  13.10.94

diagnosis: P II (0 alive), overflow incontinence due to an atonic bladder, leaking urine for 7 mth which started immediately following obstructed last labor for 3 days, in hospital sb female, married 4 yr ago post(menarche 1 mth earlier), not living with husband, normal menstruation, drop foot R (grade 3-4), no rvf; pubic angle normal  144.0 cm

13.10.94 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 17 cm), no elevation, euo/b 2 cm, >1500 ml urine increased bladder capacity (17-2 = 15 cm)  foley ch 18; free urine

26.11.94 not leaking at all  cath removed  bladder drill under supervision
01.12.94 not leaking at all, no incontinence, normal miction incontinence
20.01.95 idem
11.03.95 not leaking at all, no incontinence, normal miction  healed, no stress
hypotonic bladder long-standing mth 10

katsina cath 543

atonic bladder for 10 months! ? neurogenic component?

sgd (Rép Nig) female 16 yr 16.11.96

diagnosis: PI, overflow incontinence due to atonic bladder (no spontaneous miction), leaking of urine for 10 mth which started immediately following obstructed labor for 1 day, in hospital sb male, married 3 yr ago pre(menarche 1 yr later), not living at husband, no menstruation, drop foot R (grade 2-3) and L (grade 2-3), no rvf; narrow pubic arch, no yankan gishiri, open bedsore R buttock and closed bedsore L buttock 158.0 cm

16.11.96 asmall suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 17 cm), moderate elevation after draining of > 500 ml urine, euo/b 2.5 cm increased bladder capacity (long diameter 17-2.5 = 14.5 cm, so atonic bladder) bedsore documented 16.11.96

15.01.97 not leaking at all cath removed bladder drill
29.01.97 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
25.02.97 idem
19.05.97 not leaking at all, no incontinence, normal miction healed, no stress

however, in 1996 no testing yet for anal reflex and saddle anesthesia as function of pudendal nerve

hypotonic bladder
hypotonic bladder long-standing yr 2
also sacral plexus trauma

long-standing atonic bladder with neurogenic component

hsb (jigawa) female 30 yr 02.06.03
diagnosis: PV (4 alive), overflow incontinence due to atonic bladder, leaking urine for 2 yr which started 10 days following obstructed last labor for 1 day, in hospital live male, married 18 yr ago pre(menarche 1 yr later), not living with husband, normal menstruation, drop foot R (grade 3-4) and L (grade 4), no rvf, no yankan gishiri; normal ap diameter/pubic arch 85°, anal reflex neg/small-saddle anesthesia L, R side normal 160.0 cm

02.06.03 small suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 17 cm), bladder trabecularization ++, moderate elevation after draining >1,000 ml urine, euo/b 2 cm
increased bladder capacity (longitudinal diameter 17-2 = 15 cm, atonic bladder)
acceptable position UV-junction not against middle third symphysis

22.06 + 27.07.03 not leaking at all cath removed bladder drill
06.06.04 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence
Clinical science
evidence-based practice
excellent final healing rate

repeat hypotonic bladder

hypotonic bladder
2x repeat
3x repeat
5x repeat
repeat hypotonic bladder 2x
delivery I + III

katsina cath 370

hmmj (katsina) female 15 yr 22.11.93

diagnosis: PI, overflow incontinence due to atonic bladder, **leaking urine for 9 days which started 1 day** following obstructed labor for 2 days, in hospital live female, married 3 yr ago post(menarche 1 mth earlier), not with husband, no menstruation, no h/o drop foot, no rvf, episiotomy L broken 172.0 cm

22.11.93 suprapubic mass, avw bulging into vagina, bladder overdistended (euo/bw 23 cm), euo/b 2 cm, > 1.5 liter urine foley ch18

27.12.93 not leaking at all cath removed bladder drill
25.01.94 not leaking at all, no incontinence, normal miction insp/ healed, good elevation, no stress incontinence
01.03.94 idem
18.12.95 not leaking at all, no incontinence, normal miction healed, no stress

09.05.96 amenorrhea for 7 mth not leaking at all instructions
second obstetric atonic bladder following delivery II
16.08.96 foley ch 18 for 6 wk cath aafa
24.09.96 not leaking at all cath removed bladder drill
15.10.96 not leaking at all, no incontinence, normal miction insp/ healed, moderate elevation, no stress incontinence
repeat hypotonic bladder 3x delivery I + II + IV

long-standing

katsina cath 622
third obstetric atonic bladder vvf 1846
repeat atonic bladder 3x (10/6-92 EUO/BW 20 cm, see also 25/6-94) cath 410
see/adjust all records! rvf
neurogenic?? or superimposed on bladder overdistension??

bak (katsina) female 21 yr 12.09.98

diagnosis: PIV (2 alive), overflow incontinence due to atonic bladder (no spontaneous miction!), leaking urine for 1.5 yr that started immediately following obstructed last labor 1 day, at home live male, married 10 yr ago pre(men arche 7 mth later), still living with husband, normal menstruation, no (h/o) drop foot, also incontinence for flatus (but not for stools!!), no yankan gishiri; normal ap diameter/pubic arch, nb successful uuvf-repair d.d. 2/5-91 (b/r_ba) and anterior colposuspension d.d. 19/1-92 (b/r_myself) after delivery I anal reflex +

12.09.98 no suprapubic mass, avw bulging into vagina, bladder overdistended (euro/bw 17 cm), poor elevation after draining 200 ml of urine, euro/b 2.5 cm (vesiculization) increased bladder capacity (long diameter 17-2.5 =14.5, atonic bladder) poor position UV-junction away from middle third symphysis

pat did not return until 06.07.99 still leaking foley ch 18 instructions

03.10.99 insp_gv/ no fistula, detrusor instability +++ only bladder drill
06.11.99 leaking always incontinence for flatus/not for stools ?neurogenic?
incip urge +++ bladder drill TCA 6/12
14.09.00 stress incontinence ++ for colposuspension

16.09.00 operation: ant colposuspension vvf 4850
13.12.00 not leaking at all cath removed bladder drill
11.10.01 not leaking, no incontinence, normal miction 2° cervix prolapse Insp/ healed, good elevation, no stress incontinence

hypotonic bladder
repeat hypotonic bladder 5x delivery I + II + III + ab + IV

katsina cath 557

congress_book_article_theory_practice

4x/5x postpartum hypotonic bladder; continence mechanism trauma

sadt (rép niger) female 14 yr 24.03.97

diagnosis: PI, overflow incontinence due to atonic bladder, leaking urine for 12 days which started immediately following obstructed labor for 2 days, at home live female who died 7 days later, married 1 yr ago pre (menarche 3 mth later), not living with husband, no menstruation, drop foot R (grade 2) and L (grade 2), no h/o yankan gishiri; narrow pubic arch 153.0 cm

24.03.97 suprapubic mass, avw bulging into vagina, bladder overdistended (EUO/BW 24 cm), moderate elevation after draining > 1,500 ml of urine, EUO/B 2 cm increased bladder capacity (longitudinal diameter 24-2 = 23 cm, atonic bladder)

05.05.97 not leaking at all cath removed bladder drill

12.05.97 not leaking at all, no incontinence, normal miction

09.06.97 idem

04.09.97 not leaking at all, no incontinence, normal miction healed, no stress

23.02.98 amenorrhea for 4 mth not leaking at all instructions

second “atonic” bladder completely ok until PII (1 alive) live male at home

21.05.99 400 ml urine euo/bw 13 cm euo/b 1 cm cath 644

28.11.99 not leaking at all, normal miction insp/ healed, no stress

third “atonic” bladder completely ok until PIII (2 alive) live female at home

02.04.02 400 ml urine euo/bw 15 cm euo/b 1 cm cath 783

27.05.02 not leaking at all, normal miction insp/ healed, no stress

fourth hypotonic bladder completely ok until ?spontaneous abortion?

07.03.03 200 ml urine euo/bw 16 cm euo/b 1 cm cath

08.09.03 not leaking at all, normal miction insp/ healed, no stress

fifth atonic bladder completely ok until PIV (2 alive) sb male at home

30.12.05 300 ml urine euo/bw 18 cm euo/b 2 cm cath 949

24.05.06 not leaking at all insp/ healed, good elevation, no stress
exceptional obstetric trauma
hypotonic bladder, sphincter ani rupture, necrotizing infection
day 11 + day 37 + mth 9
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>vvf</td>
<td>vesicovaginal fistula</td>
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<tr>
<td>rvf</td>
<td>rectovaginal fistula</td>
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<tr>
<td>uvvf</td>
<td>urethrovesicovaginal fistula</td>
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<tr>
<td>vcvf</td>
<td>vesicocervicovaginal fistula</td>
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<td>vesicouterovaginal fistula</td>
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<td>cervix</td>
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<td>anterior vagina wall</td>
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<td>posterior vagina wall</td>
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<td>pcmf</td>
<td>pubocervical musculofascia</td>
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<td>atf</td>
<td>arcus tendineus fasciae</td>
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<td>arcus tendineus of levator ani muscle</td>
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<td>pcm</td>
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<tr>
<td>ocm</td>
<td>obturatococcygeus muscle</td>
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<tr>
<td>iscm</td>
<td>(ischio)coccygeus muscle</td>
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<tr>
<td>iom</td>
<td>obturator internus muscle</td>
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<tr>
<td>pm</td>
<td>piriformis muscle</td>
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<td>sul</td>
<td>sacrouterine ligament</td>
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<td>bl</td>
<td>broad ligament</td>
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<tr>
<td>cl</td>
<td>cardinal ligament</td>
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<td>epd</td>
<td>endopelvic diaphragm</td>
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<td>ch</td>
<td>charrière</td>
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<td>parity</td>
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<td>sb</td>
<td>stillborn</td>
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<tr>
<td>cs</td>
<td>cesarean section</td>
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<td>subtotal hysterectomy</td>
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<tr>
<td>tah</td>
<td>total abdominal hysterectomy</td>
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<tr>
<td>tvh</td>
<td>total vaginal hysterectomy</td>
</tr>
</tbody>
</table>
abbreviations

vvf = vesicovaginal fistula
rvf = rectovaginal fistula
uvvf = urethrovesicovaginal fistula
vcvf = vesicocervicovaginal fistula
vuvf = vesicouterovaginal fistula
cx = cervix
avw = anterior vagina wall
pvw = posterior vagina wall
pcmf = pubocervical musculofascia
atf = arcus tendineus fasciae
atlam = arcus tendineus of levator ani muscle
lam = levator ani muscle
pcm = pubococygeus muscle
ocm = obturatococygeus muscle
iscm = (ischio)cocygeus muscle
iom = obturator internus muscle
pm = piriformis muscle
sul = sacrouterine ligament
bl = broad ligament
cl = cardinal ligament
epd = endopelvic diaphragm
ch = charrière
g = gauge
h = hegar
p = parity
sb = stillborn
cs = cesarean section
sth = subtotal hysterectomy
tah = total abdominal hysterectomy
tvh = total vaginal hysterectomy

euo = external urethra opening
iuo = internal urethra opening
uv(-junction) = urethrovesical (junction)

euo/f = distance between euo and fistula
f/c = distance between fistula and cervix
f/v = distance between fistula and vagina vault;
euo/b = distance between euo and catheter balloon
euo/bw = distance between euo and bladder wall (fundus)
a/f = distance between anus and (rectovaginal) fistula
i/v = distance between introitus and vagina vault; vagina length

pa = pubic arch
ap = anterior to posterior pelvis diameter
ar = anal reflex

gm = gastrocnemius muscle
sm = soleus muscle
at = achilles tendon

min = minute
hr = hour
wk = week
mth = month
yr = year

R = right
L = left

bladder capacity by longitudinal diameter (euo/bw minus euo/b)
small \( \leq 4 \text{ cm} \)
moderate \( 5-6 \text{ cm} \)
normal \( 7-12 \text{ cm} \)
transitional \( 13-14 \text{ cm} \)
increased \( \geq 15 \text{ cm} \)
normal pelvis measurements

vagina length  10-12 cm

euo/c  6-7-8 cm

anatomic urine continence mechanism  4-5 cm
anatomic stool continence mechanism  4-5 cm

urethra length  3.5-4 cm
however, during surgery it is more in the range of 2.5-3 cm; exceptionally 5 cm

longitudinal bladder diameter (euo/bw minus euo/b)  7-12 cm

anorectum  4-5 cm

symphysis  5-6 cm broad
axis inclination  30-45° as to horizontal in the upright position

pubic arch  85-90°

atf  7.5-8 cm
inclination  25-30° as to horizontal from pubis bone to ischium spine

atlam  7-7.5 cm
inclination  25-30° as to horizontal from pubis bone to ischium spine

angle between symphysis and atf/atlam  110-125°

inter ischium spine distance  10 cm

inter ischium tuberosity distance  10-11 cm

pelvis inlet plane inclination 55-60° to horizontal from superior symphysis edge to promontory in the upright position

pelvis outlet  10-15° to horizontal from inferior symphysis to tip of coccyx in the upright position

anterior triangle pelvis outlet from inferior symphysis to ischium tuberosity in one plane with -10 to-15° inclination to horizontal in upright position

posterior triangle pelvis outlet from ischium tuberosity to tip of coccyx in one plane with 45-50° inclination as to horizontal in upright position

angle anterior perineum/posterior perineum 55-65°/115-125°
pelvis outlet surface 75-80 sq cm

gap between levator ani ledges  25-30 sq cm

diameter recta from inferior symphysis up to tip of coccyx 9.5 cm; up to 10.5-11cm during delivery

perineum outlet

spb  = symphysis to perineal body 3.5-4.5 cm
pb height  2 cm
anus (+ sphincter) diameter  1.5-2 cm
pac  = anus to coccyx bone 5-6 cm
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and as influenced by many others since the author started his medicine study in 1959 but especially by prof j m greep, prof t k a b eskes and dr med h stenkhoff
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<tr>
<th>Author</th>
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<td>Kees Waaldijk</td>
<td>the (surgical) management of bladder fistula in 775 women in northern Nigeria</td>
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</tbody>
</table>

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