

Start	End	Topic	Speakers
14:00	14:15	Introduction and Overview	<ul style="list-style-type: none"> • Sherif Mourad
14:15	14:30	Epidemiology of Vaginal Fistulas	<ul style="list-style-type: none"> • Sohier Elneil
14:30	14:45	Anatomic Aspects & Aetiology	<ul style="list-style-type: none"> • Hassan Shaker
14:45	15:00	Classification of Vaginal Fistulas	<ul style="list-style-type: none"> • Edward Stanford
15:00	15:15	Surgery for Low Vaginal Fistulae	<ul style="list-style-type: none"> • Dirk De Ridder
15:15	15:30	Discussion	All
15:30	16:00	Break	None
16:00	16:15	Surgery for High Vaginal Fistula	<ul style="list-style-type: none"> • Sohier Elneil
16:15	16:30	Laparoscopic/Robotic Surgery for Vaginal Fistula Repair	<ul style="list-style-type: none"> • Hassan Shaker
16:30	16:45	Ureterovaginal, uterovaginal and other rare cases	<ul style="list-style-type: none"> • Dirk De Ridder
16:45	17:00	How to Treat Complications of Fistula Repair	<ul style="list-style-type: none"> • Sherif Mourad

Aims of course/workshop

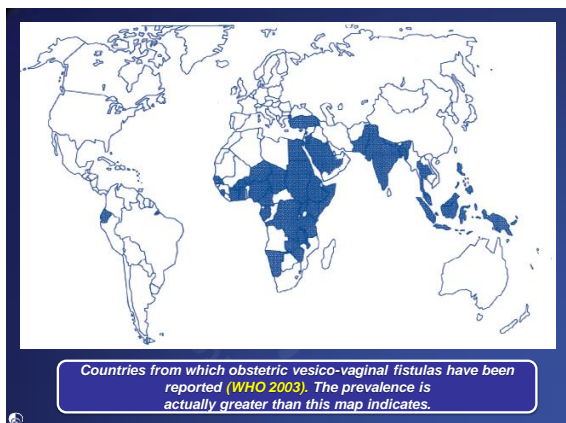
This workshop is very important in showing the audience the real factors after the increased numbers of vaginal fistulae, not only in the developing countries, but among the well developed countries as well.



Vaginal Fistula Repair; Lesson learned

Introduction

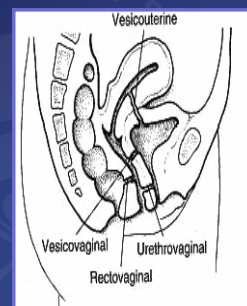
- Vesicovaginal fistula (VVF) is a subtype of female urogenital fistula (UGF).
- VVF is an abnormal fistulous tract extending between the bladder and the vagina.
- It allows continuous involuntary discharge of urine into the vaginal vault.



Countries from which obstetric vesico-vaginal fistulas have been reported (WHO 2003). The prevalence is actually greater than this map indicates.

Types of Urogenital Fistula

- Vesicovaginal fistula
- Recto-vaginal fistula
- Urethrovaginal fistula
- Ureterovaginal fistula
- Vesicouterine fistula

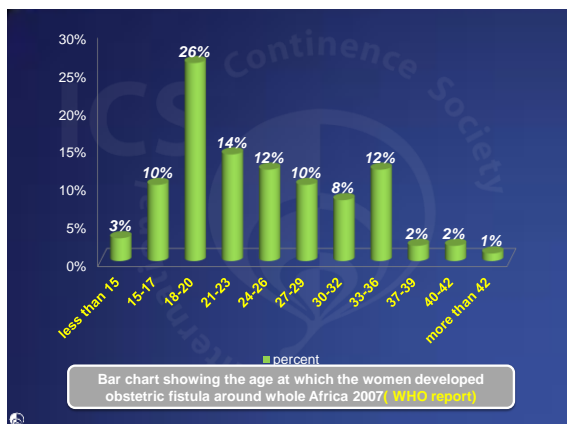


Fistula

- **The obstructed labor complex**
 - Delay in deciding to seek help
 - Delay in arriving at the health care facility
 - Delay in receiving adequate care
- **(Sexual abuse, rape, accidents)**
- **(Traditional practices)**
 - Gishiri cutting, infibulation
- **Injuries sustained during operative interventions**
 - Forceps, cesarean section
 - Most prevalent cause in the Western world
 - Hysterectomy, gynecological procedures

Etiology in Developing Countries

- Marriage and conception at a young age, often before full pelvic growth has been achieved.
- Chronic malnutrition limits pelvic dimensions, increasing the risk of cephalopelvic disproportion and malpresentation.
- Few attendances by qualified health care professionals or having access to medical facilities during childbirth.



- Female circumcision and the practice of harmful traditional medical practices such as **Gishiri incisions** (anterior vaginal wall incisions).

- The insertion of caustic substances into the vagina with the intent to treat a gynecologic condition or to help the vagina to return to its nulliparous state.

- Prolonged impaction of the fetal presenting part in the pelvis causing widespread tissue edema, hypoxia, necrosis, and sloughing resulting from prolonged pressure on the soft tissues of the vagina, bladder base, and urethra.



- Complex neuropathic bladder dysfunction and urethral sphincteric incompetency often result, even if the fistula can be repaired successfully.

Developed Countries

- VVFs is mainly due to inadvertent bladder injury during pelvic surgery (90%).

- Bladder wall injury from electro-cautery or mechanical crushing, and the dissection of the bladder into an incorrect plane, causing avascular necrosis.

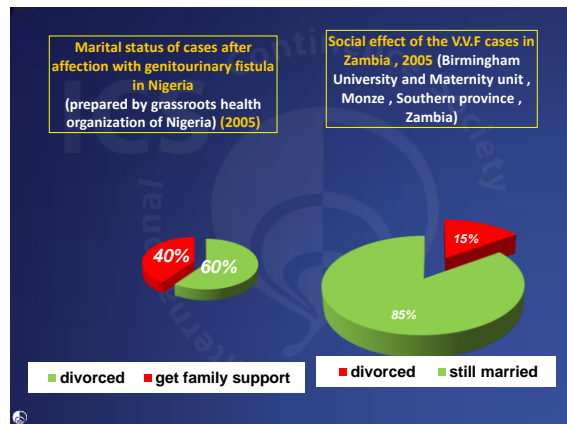
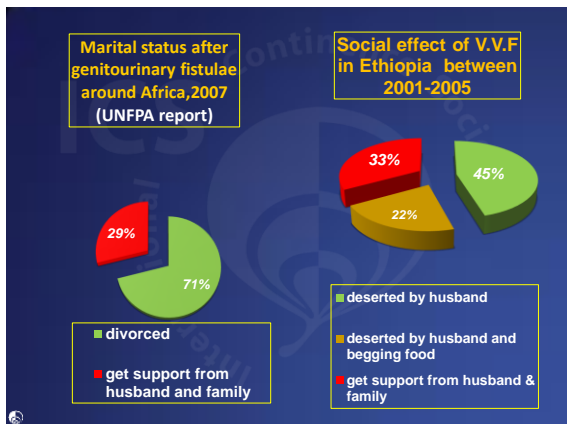
- The risk of formation of a hematoma or avascular necrosis after a suture is placed through the bladder wall can lead to infection, abscess, and subsequent suture erosion through the bladder wall.

The time of clinical presentation depends on the etiology of the VVF:

- A VVF secondary to a bladder laceration typically presents immediately.
- Approximately 90% of genitourinary fistulas associated with pelvic surgery are symptomatic within 7-30 days postoperatively.
- An anterior vaginal wall laceration associated with obstetric fistulas typically (75%) presents in the first 24 hours of delivery.
- In contrast, radiation-induced UGFs are associated with slowly progressive devascularization necrosis and may present 30 days up to many years later.

Possible Social Consequences

- Stigma and discrimination.
- Social isolation.
- Community/familial rejection.
- Divorce or abandonment.
- Verbal and Physical Abuse.
- Loss of income, extreme poverty.



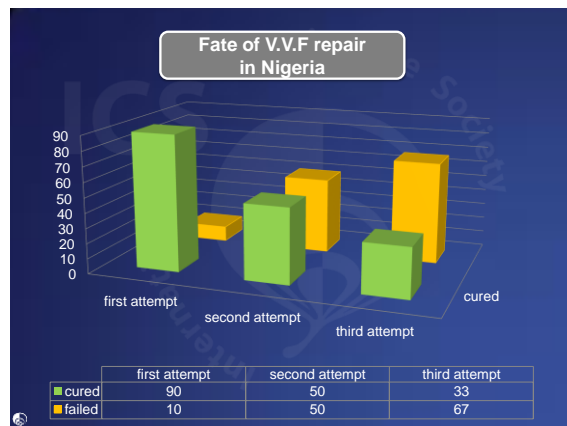
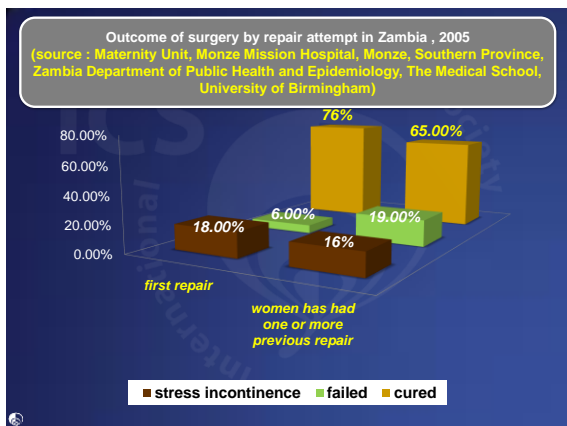
Fistula Repairs

- Treatment complexity and success depend on multiple factors including:
 - Fistula type
 - Size
 - Degree of scarring
 - Involvement urethra, ureter and bladder
 - Provider capacity
 - Postoperative care and compliance

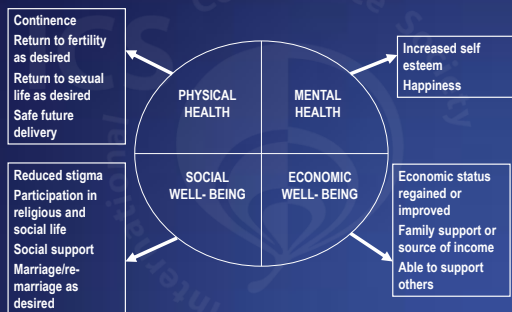
Fistula Cure

For a 100% cure; the following conditions must be fully satisfied:

- Complete continence by day and night
- Bladder capacity > 200ml
- No SIU
- Normal coitus without dyspareunia
- No traumatic amenorrhea
- Ability to bear children



Women's potential expectations for reintegration



Challenges in surgery in Africa as seen by surgeons

- Severe shortage of surgeons.
- Poor conditions of service / Poor salaries; unclear career structure.
- Concentration of surgeons in towns and cities 80 – 100% in urban areas where only 5 -15% of populations lives.
- Limited opportunities to further education and training.
- Lack of opportunities to research , and learn new techniques.

Challenges in surgery in Africa as seen by surgeons:

- Lack of opportunities for surgeons to improve and keep up with the times.
- Retention and motivation. dedication and devotion.
- Severe shortage of anesthesiologist shortage of nurses / loss of well-trained operating theater veteran nurses.
- HIV/AIDS: unsafe surgery in era of HIV pandemic.
- Generalized poverty/ economic constraints.
- Lack of appropriate/specialized equipments / instruments.

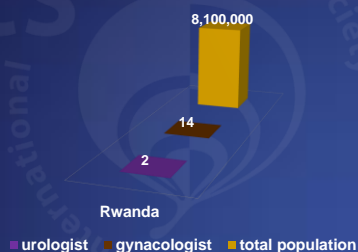
Challenges in surgery in Africa as seen by surgeons:

- Poor maintenance of available equipment.
- Poor or lack of specialized investigations e.g. CT SCAN, MRI etc.
- Shortage of consumables .
- Lack of communication facilities/knowledge .
- Shortage of blood supply.
- Absence of high care ward.
- Fluctuating power supply.
- Lack of funds for research.

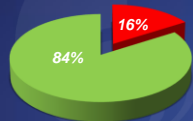
Distribution of surgeons in Africa (1999-2003)
(source :Dep. Of surgery, Makerere university , kampala , Uganda)



Prepared by UNFPA country office and Engender Health under support of Columbia university ,2004



**Liability to V.V.F repair in Ghana according to availability of cost ,2007
(UNFPA local office report)**



■ do repair ■ could not do repair

**Recommendations to prevent and solve
V.V.F problem:**

- The existing cases of VVF in these communities should be repaired , and adequate measures taken to ensure their rehabilitation and reintegration back into the society.
- Future cases of VVF, should be prevented and controlled through preventing the occurrence of marriage before 18 yrs.
- Awareness creation and public enlighten on the dangers of early marriage, the importance of ante natal services, as well as, hospital delivery.
- Acceptability and accessibility to modern health facilities should be enhanced.

•Groups, such as Mother-in-Laws, Grand Mothers, as well as, men should be given special focus. This still assist in creating a much more supportive environment, for the women in the household.

•There is need for the creation of more VVF Repair Centers, as well as , the training of Doctors and Nurses to these facilities. This will control the problem of distance and accessibility, as well as, knowledge of existing services.

•The Cost of VVF Repairs should be subsidized through the establishment of a National VVF Fund

Vaginal Fistula: Epidemiology and Quality of Life Perspectives

Sohier Elneil

Genital tract fistula is a problem commonly encountered in the developing world that affects young women during pregnancy and the labour process, resulting in debilitating urinary and/or faecal incontinence. Historically many women suffered this predicament in Europe and the United States of America, until the middle of the last century. However, with social, economic and health development this problem all but disappeared in the developed world but still poses a major problem in Africa and Asia [1, 2]. Access to modern obstetric care, including caesarean sections, can be limited on these continents. Over the course of a lifetime, 1 in 12 women in Africa will die in pregnancy or labour, particularly in the rural areas [3]. This is a phenomenal figure and akin to three jumbo jets, full of passengers, crashing fatally every 24 hours. More startlingly, for every woman that dies in labour, at least 20 lives are destroyed by terrible injuries sustained during obstructed labour. Long distances combined with high cost of care, and poor nutrition make women more vulnerable to obstetric fistulas, particularly in West Africa [4], the horn of Africa [5] and the Indian sub-continent [6-8].

POSTPARTUM TRAUMA AND GENITAL TRACT FISTULAS

In the developing world early identification of a postpartum or perineal trauma problem soon after childbirth is vital. In many cases, pelvic floor and perineal damage sustained during childbirth can be repaired effectively, if identified and treated as soon as possible. But, when neglected it can lead to debilitating pain, chronic infection and other long-term complications such as faecal and urinary incontinence. In severe cases, the damage can be so severe that a genital tract fistula, an abnormal communication between the vagina and the surrounding pelvic organs, can result.

Social and economic development in the developed world meant that fistulas are no longer a significant cause of morbidity in the post-partum period, but unfortunately, obstetric fistulas still pose a major problem in Africa and Asia [1, 2]. A tremendous disparity exists between risks associated with pregnancy and labour faced by women

in the developing world compared to women from wealthier nations. Over the course of a lifetime, 1 in 30, 0000 Scandinavian women will die in pregnancy or labour, whereas 1 in 12 will die in Africa, particularly in the rural areas [3]. Furthermore, for every woman that dies in labour, at least 20 lives are destroyed by terrible injuries sustained during obstructed labour. Using the 1:20 ratio, it is estimated that there are up to 2 or 3 million cases of obstetric fistula, still awaiting treatment. This is a conservative estimate by all accounts.

Long distances combined with high cost of care, and poor nutrition make women more vulnerable to obstetric fistulas, particularly in West Africa [4], the horn of Africa [5] and the Indian sub-continent [6-8].

The main treatment for all types of fistulas remains surgery which is carried out under meticulous circumstances. The success of the repair is not only dependant on good surgery, but also on excellent nursing care and prevention of complications [8[9-11]. However, the number of capable and dedicated surgeons remains a major stumbling block in the management of these patients, as well as a lack of consensus on fistula classification, which affects the appropriate treatment of patients, prognostic evaluation and literature reporting; working in isolation and variable care practices; and little or no evidence based medicine in decision making. In addition, training in fistula surgery is often patchy, inadequate and unfocussed. But most importantly, there is no way to assess trainees or determine their suitability. As a consequence, outcomes for some patients have been very poor indeed.

In the last two years, two highly significant unifying global initiatives were undertaken. The first was by the Federation of Gynaecology and Obstetrics, (FIGO), an international multi-disciplinary body of obstetricians and gynaecologists, who are trying to standardise training and provide an evidence-based training course; and the second was the formation of the International Society of Obstetric Fistula Surgeons (ISOFS), who want to unify surgeons from all over the world in adopting the same

strategy in classification, training and education. This work has been done in conjunction with the UNFPA, WHO and other non-governmental organizations.

Using the agreed information, provided by the fistula surgeons, they were able to formulate and develop learning tools, log-books and objective structured assessments of technical skill for each module. This is the first time such an initiative has been developed for a specific internationally recognised health problem. Using the manual will not only provide a guide to surgical training, but also initiate audit of surgical outcomes thus facilitating research in the field and promoting publication in the medical and nursing literature.

The new way forward in obstetric fistula management is following in the foot step of many other dedicated doctors, nurses and philanthropists in the past. Though, the objectives are to unify the fistula community, develop standardised training programmes, and improve outcomes it must not be forgotten that this condition is completely preventable. Therefore, the issues which are the basis for it, social and economic development of 'at risk' girls/women, need to be tackled. This includes universal access to emergency obstetric services, improving medical care and instituting appropriate integrated social, economic and cultural development programmes. This would effectively prevent the problem. In the long-term, social and economic development will be more cost-effective than medical treatment, but more importantly, it will be highly sustainable. In the interim period, a holistic approach to medical and surgical treatment, rehabilitation and follow up in the community would be the most appropriate.

EPIDEMIOLOGY

There is a significant problem in that we do not have any idea of how prevalent the problem is. Epidemiological studies on obstetric fistula remain inadequate. At the SIU in Marrakech in October 2010, the International Consultation on Vesico-vaginal fistula was undertaken. It was here that the literature was reviewed and the issues regarding the epidemiology of this condition were studied. There was a paucity of literature, but the main study findings were:

- They are mainly institutionally-based, retrospective cases series, often written from the perspective of a single fistula surgeon
- The geographical coverage of epidemiological reports is uneven
- However, better and more relevant information is emerging.

The major risk factors appear to be age at first marriage, short stature, pregnancy with a male child rather than a female child, failure to attend ante-natal care, low socio-economic status, low social class, lack of employment and illiteracy.

The impact of fistula on the women were devastating and included divorce, social isolation, worsening poverty, malnutrition, sexual dysfunction, mental illness, insomnia, general ill health and thoughts of worthlessness and suicide.

Documentation of the patient's obstetric history was poor, and in most cases there was little or no documentation of the patient's labour history. There is doubt that health services were often lacking.

Recommendations to improve on this difficult situation included the promotion of community-based epidemiological studies, the use of standardised collection tools, the use of observational studies and research that identifies the different profiles of women who manage to overcome the obstacles and successfully access health care, compared to those who do not.

CONCLUSION

Genital tract fistulas remain a significant problem in the developing world. We need more information about the women suffering this condition, to understand how to better impact and improve on their quality of life. We need to engage the women, their families, their society and their governments to help treat the current problem, but more importantly to prevent it in future generations.

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1 **ANATOMY PERTAINING TO VESICOVAGINAL FISTULA**

Hassan Shaker, M.D. MSc.

Ain Shams University

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5 **Anatomy of pelvic support**

Muscular support:
Pelvic diaphragm.

Fascial support:
Endopelvic fascia.

6 **I) Muscular support:
Pelvic Diaphragm**

Levator Ani
▪ Pubo-coccygeus
▪ Ilio-coccygeus
▪ Ischeo-coccygeus

Coccygeus

7 **MRI of the Levator Ani**

8 **II) Fascial Support:
Endopelvic fascia**

Pubo-urethral
 Urethro-pelvic
 Vesico-pelvic (Pubo-cervical)
 Cardinal.

9 **Endopelvic fascia**

1) Pubo-urethral

- ☐2) Urethro-pelvic
- 10 ☐ **Endopelvic specialized fasciae. Cont.**
 - ☐3) Vesico-pelvic fascia.
 - ☐4) Cardinal ligament.
- 11 ☐ **The Urethro-pelvic Fascia**
- 12 ☐ **Physiology of female continence**
- 13 ☐ **Defects in the pelvic fasciae:**
 - 1) Urethro-pelvic fascia
- 14 ☐ **Defects in the pelvic fasciae:**
 - 2) Vesico-pelvic fascia
 - ☐1) Central Defect:
 - Bladder herniation in midline
 - ☐2) Lateral defect (Para-vaginal):
 - Sliding hernia of both the bladder and vesico-pelvic fascia.
 - ☐3) Combination (most common):
- 15 ☐ **Defects in the pelvic fasciae:**
 - 3) Cardinal ligaments
 - ☐Uterine prolapse
 - ☐Cystocele
- 16 ☐ **SURGICAL PRINCIPLES OF VVF REPAIR**

Hassan Shaker, M.D., MSc., Ph.D.
Ain Shams university
Cairo, Egypt
- 17 ☐ **Principles of repair of any fistula**
 - ☐Use the approach that gives you better access.
 - Don't forget posterior release incisions (episiotomies)
 - ☐Edges should be dissected for at least 2 cm
 - ☐Fistulas tract should be trimmed ?????
 - ☐Repair should be in anatomical layers
 - ☐Tension free closure
 - ☐No overlapping of suture line

- Crisscross closure of layers
- Flaps techniques
- Use tissue interpositioning
- Use fibrin glue
- Good drainage

18 19 **Should we trim the VVF edges?**

- 1 TRIM THE EDGES
 - 2 □ Follow the basic surgical principles
 - Refresh the edges → better healing
- 3 DON'T TRIM THE EDGES
- 4 □ Trimming the edges may:
 - Enlarge the fistula
 - Closure under tension
 - Cause bleeding
 - Causes bladder spasms
- No trimming it:
 - Strong fibrous ring → holds suture
 - Repair easier

20

- No difference in recurrence rate
- Recurrent fistulae tend to be smaller if edges are left without trimming

21 **Tissue Interpositioning**

- 1) Vaginal approach:
 - Martius Flap
 - Full thickness labial flaps
 - Peritoneal flap
 - Muscular flap (gracilis)
 - Fibrin glue

▣2) Abdominal Approach:

- Rectus abdominis flap
- Peritoneal flap
- Omental flap

22 **ETIOLOGY OF VESICO-VAGINAL FISTULA**

Hassan shaker, M.D., MSc., Ph.D.
Professor of Urology
Ain Shams University

23

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25 **Post-hysterectomy Fistula**

- ▣Incidence of Bladder injury during hysterectomy: 1-1.7%
(Mathevet, 2001; Gilmour, 1999)
- ▣Incidence of post hysterectomy VVF 0.1-0.2% (Harris, 1995)

26 **Pathogenesis: of post-hysterectomy VVF**

27 **Pathogenesis of VVF secondary to obstructed labor**

28 **Factors associated with obstructed labor**

- ▣1) Young marriage age
- ▣2) Inaccessibility of medical care.
- ▣3) poor nutrition causing contracted pelvis
- ▣4) Use of certain caustic agents to treat vaginal conditions
- ▣5) Mutilating circumcision

29 **Post-irradiation fistula**

- ▣Incidence: 0.6-2% of irradiated cervical cancer patients
(Perez 1999)
- ▣May occur several years after treatment but median time to
occurrence 8.7 months
(Emmeret and Kohler, 1996)
- ▣Due to
 - Ischemic necrosis due to endarteritis obliterans

- Recurrence of the tumor → biopsy is necessary

30

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Surgery for low fistula

Dirk De Ridder, MD, PhD, FEBU
University Hospitals K.U.Leuven, Belgium
St. Luc Hospital, Kisantu, RD Congo

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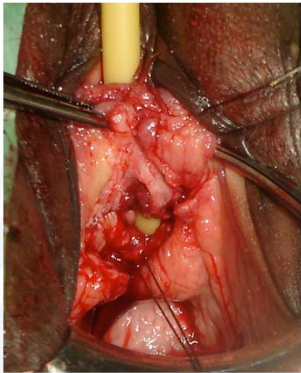
Fistula repair

- Identifying the fistula
- Gaining access and exposures
- Incision, dissection and mobilisation
- Closure of the fistula
- Continence
- Post-op care

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Clinical diagnosis

- Location
- Size
- Urethral involvement
- Scarring
- Ureters
- Posterior wall

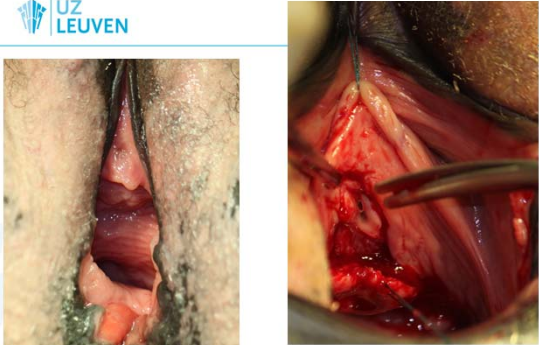


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Clinical examination under anesthesia



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Fistula repair

- Identifying the fistula
- Gaining access and exposures
- Incision, dissection and mobilisation
- Closure of the fistula
- Continence
- Post-op care


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Gaining access and exposure

- Traction sutures
- Specula
- Episiotomy
- Blue dye
- Catheter/sound



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Fistula repair

- Identifying the fistula
- Gaining access and exposures
- Incision, dissection and mobilisation
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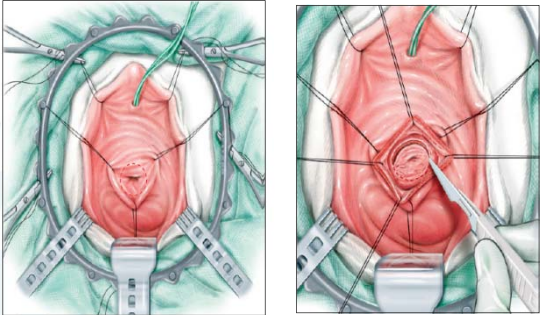
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Incisions

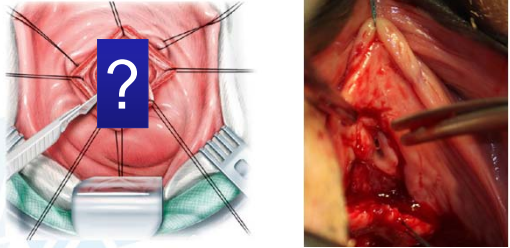
- Latzko / circumferential incision
- J-shaped incision
- Horizontal incision at fistula base

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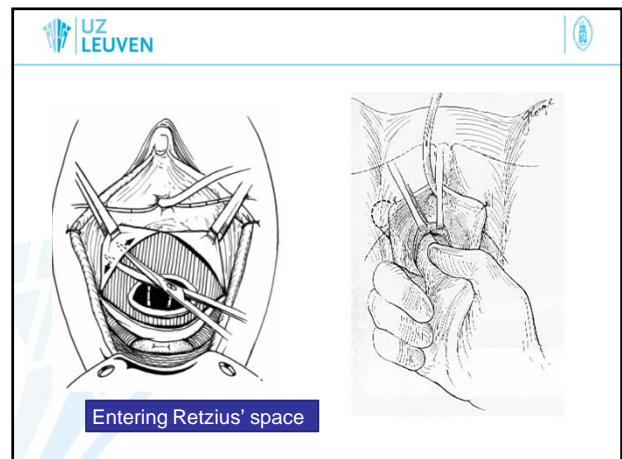
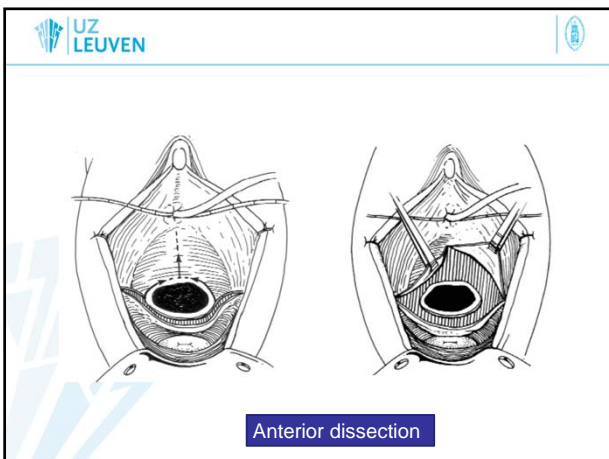
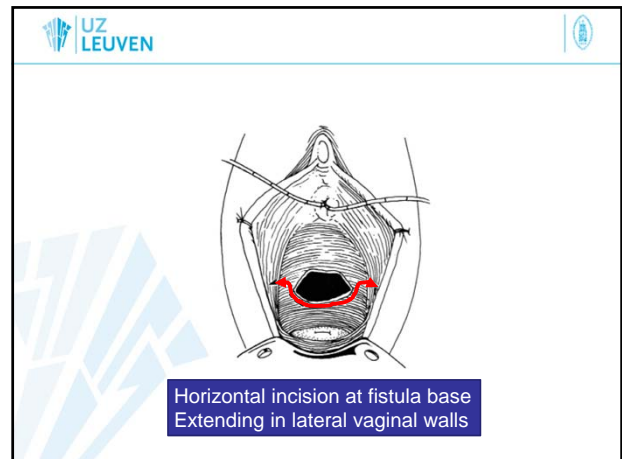
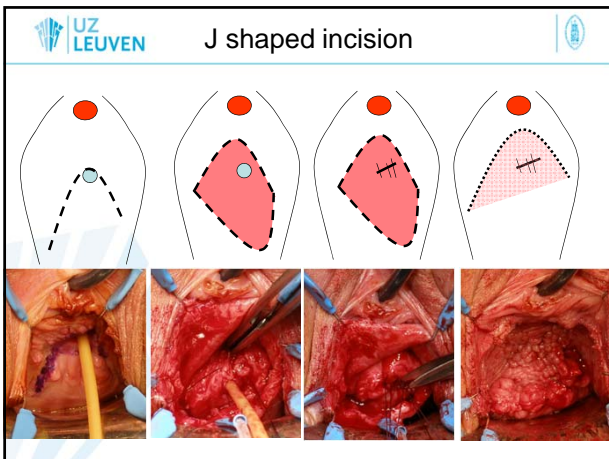
Latzko incision



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Surgical Atlas Vesico-vaginal fistula. Chapple C. & Turner-Warwick W.; BJUI 2005, 95:193-214
 Sheriff Mourad et al. 2010



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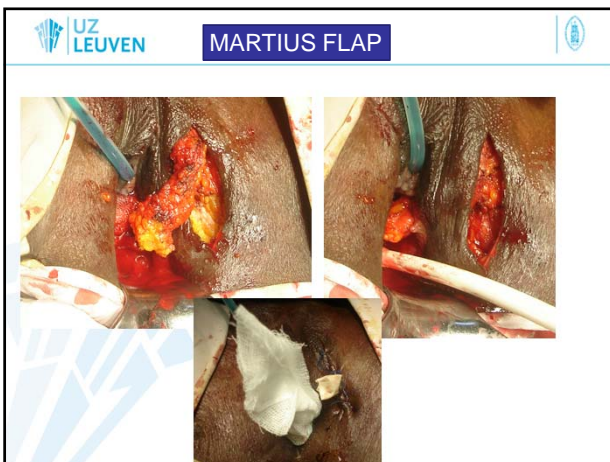
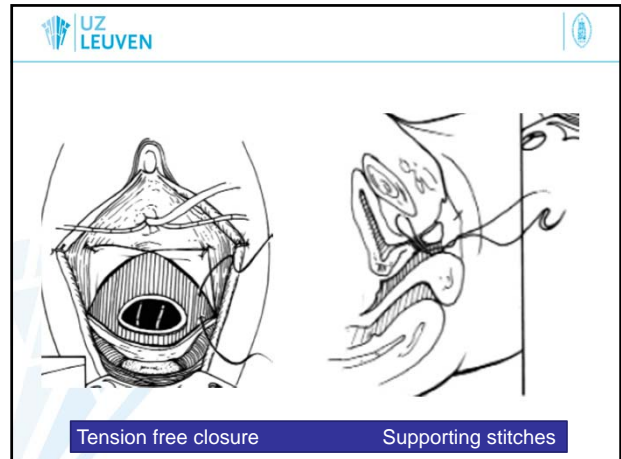
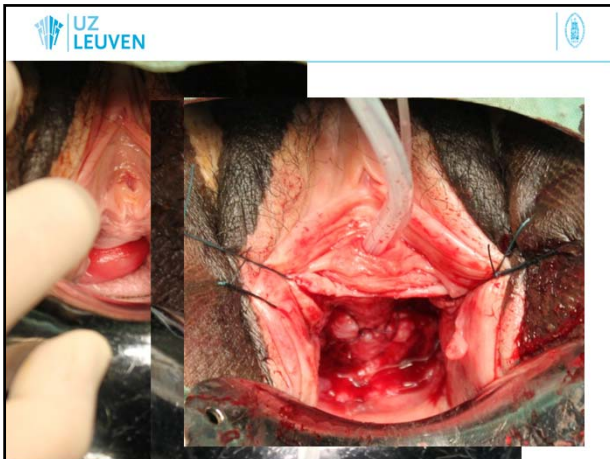
Fistula repair

- Identifying the fistula
- Gaining access and exposures
- Incision, dissection and mobilisation
- Closure of the fistula
- Continence
- Post-op care

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Closure of the fistula

- Absorbable sutures 2/0
- Strong bites in detrusor and serosal layers, no need to close the urothelium separately
- Single layer, separate sutures 4mm apart
- Martius flap is optional
- Supporting sutures can be used
- Check watertight closure



MARTIUS FLAP

Fistula repair

- Identifying the fistula
- Gaining access and exposures
- Incision, dissection and mobilisation
- Closure of the fistula
- Continence
- Post-op care

Complex fistula

► **Postoperative incontinence**

- Urethral involvement OR 8.4
- Large size: for each cm OR 1.34
- Vaginal scarring OR 2.4
- Low bladder capacity OR 4.1

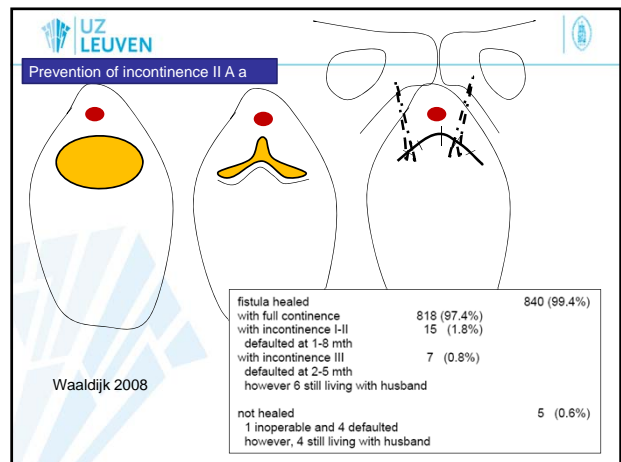
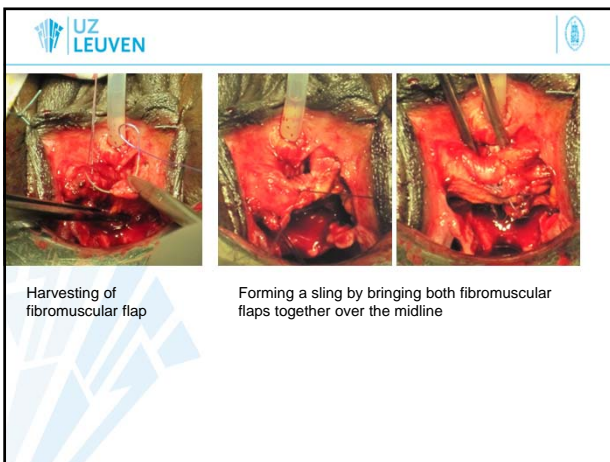
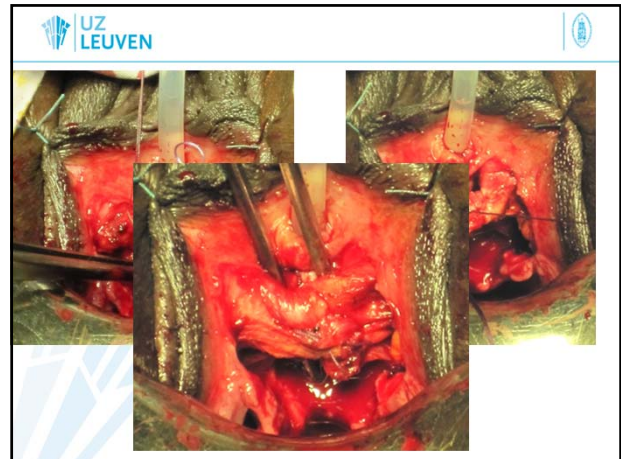
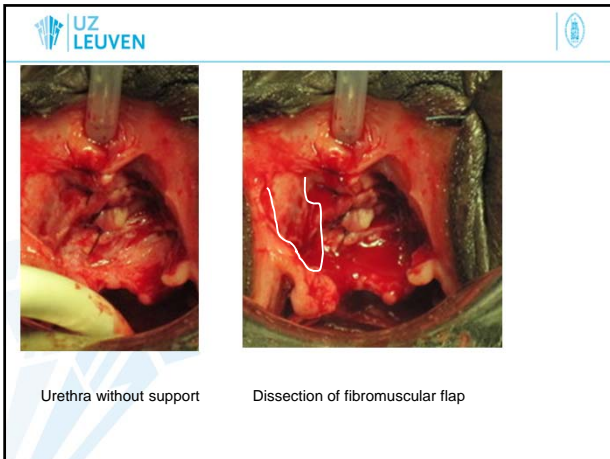
► **Principles of closure**

- Same as for simple fistula
- Additionally
 - Maintain urethral length
 - Urethra <2.4cm, urethral defect > 4mm: add slingprocedure
 - If done so: reduction of postop incontinence by 50%

Browning 2004, 2006, Waaldijk 1994

Suburethral fibro-muscular sling

-Bilateral lateral vaginal wall tissue
-Vascular
- bring over midline and suture



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Fistula repair

- Identifying the fistula
- Gaining access and exposures
- Incision, dissection and mobilisation
- Closure of the fistula
- Continence
- Post-op care

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Post-op care

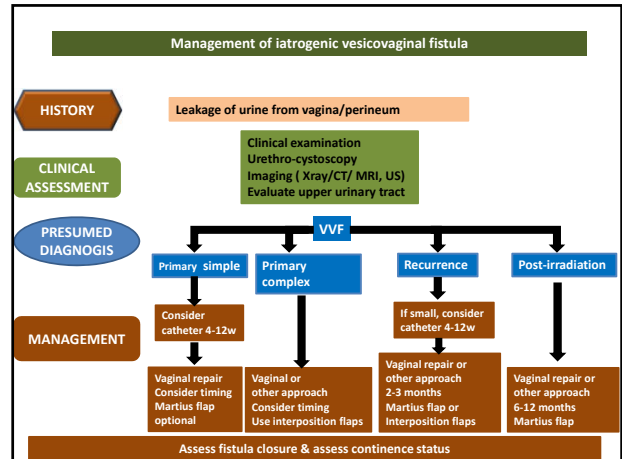
- Bladder drainage 10-14d
- Preferably silicon catheters
 - Larger internal diameter
- High fluid intake
 - Prevent cloth formation, hematuria
- No need for standard antibiotics
- Supervise/train nursing staff
- Provide pelvic floor therapy

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Alternative techniques

- Vesical rotational flaps
- Transvesical repairs
- Bladder augmentation techniques with ileal interposition
- Bladder urothelial graft
- Combined abdominal/perineal approach
- Urinary diversion

Goyal 2007, Kapoor 2007



1 **Laparoscopic repair of Vesico-vaginal fistulae**

Hassan Shaker, M.D., MSc., Ph.D.
Professor of Urology
Ain Shams University

2 **Indications**

Alternative to abdominal repair of VVF

Same indications

Restricted Access

High fistula

Close proximity to the ureteric orifices

*Not suitable for obstetric VVF

*Most suitable for gynecological VVF

*Most common in developed countries (Post-Hysterectomies)

*Minimal fibrosis

3 **Surgical Technique**

*General Anesthesia

*Low Lithotomy Position: Access to the Vagina

*Cystoscopy:

*Fistula position

*Ureters catheterized

*Ureteric or Foley catheter inserted through the VVF

*Sponge stick inserted up to the vaginal apex

*The patient is then put in Trendelenburg position

4 **Surgical technique (cont.)**

*Transperitoneal or extraperitoneal

*Trocars: 5

5 **Surgical technique (cont.)**

*Bladder is opened through the posterior wall

*Bladder is bivalved down to fistula

*Fistulas tract is dissected and and excised

6 **Surgical technique (cont.)**

*Bladder and Vagina are closed in non overlapping manner

*Bladder Longitudinal in 2 layers

*Vagina Transverse

*Omental interpositioning.

7 **Technique variation**

*LESS

(AbdelKarim, Urology 2011) ,

(Song etal., Eur J Obstet Gynecol Reprod Biol. 2011)

*Robot assisted laparoscopy

Kurz etal., Eur Urol., 2012

Sotello, Eur Urol., 2012

8 **Variations of techniques**

* Completely extravesical

(AbdelKarim, Urology 2011) ,

AbdelKarim etal., Int Urogynecol, 2011)

9 **Flap interpositioning**

- *Omental
- *Peritoneal
- *Appendices epiploecae of sigmoid colon.
- *Bladder flap

10 **Advantages of Laparoscopy over abdominal repair of VVF**

- *Shorter hospital stay (2-3 days)
 - *Less bleeding.
 - *Less pain
 - *Better magnified vision
 - *Direct access to the fistula
 - *Maintains all the principles of VVF repair
- Sotello, J urol., 2005

11 **Outcome**

- *Similar to open surgical repair
- *93% - 100% success rate Sotello, J urol, 2005,
(AbdelKarim, Urology 2011) ,

12 **Complications**

- *Inferior epigastric artery injury (1 case) (Sotello, J Urol, 2005)
- *Intestinal injury (1 case) (Sotello, J Urol, 2005)
- *LL compartment syndrome (1 case) (Otsuka etal, J endourol, 2008)
- *Conversion: 0-12% (Shah, J endourol, 2009)
(Otsuka etal, J endourol, 2008)

13




Iatrogenic Urinary fistula
Dirk De Ridder, MD, PhD, FEBU

UZ Leuven | Herestraat 49 | 3000 Leuven | www.uzleuven.be | tel +32 16 37 22 11 | UNIVERSITY HOSPITALS LEUVEN

Epidemiology of iatrogenic fistula

- Fistula cause
 - Gynecologic surgery 82%
 - Obstetric procedures 8%
 - Irradiation 6%
 - Trauma 4%

Lee 1988



The diagnosis and treatment of iatrogenic ureteral and bladder injury caused by traditional gynaecology and obstetrics operation

Dapang Rao · Haifeng Yu · Haibo Zhu · Ping Duon

41/25987= 1,6/1000

Types of operation	Bladder injuries				
	Hysterectomy	Subtotal hysterectomy	Radical hysterectomy	Cesarean	Vaginal hysterectomy
	15,654	2,168	1,227	6,732	206
IBI(case)	5	4	7	8	0
The incidence	0.032%	0.185%	0.581%	0.104%	0


Types of operation	Ureteric injuries				
	Hysterectomy	Subtotal hysterectomy	Radical hysterectomy	Cesarean	Vaginal hysterectomy
	15,654	2,168	1,227	6,732	206
IUI(case)	4	7	5	1	0
The incidence	0.026%	0.323%	0.913%	0.013	0

Arch Gynecol Obstet 2011; 203: 207-211

Epidemiology

- Incidence
 - Hysterectomy for benign disease
 - 1.3% bladder injury, <1% ureteral injury
 - Higher risk for larger cystotomies, larger uterus and more operative bloodloss
 - No difference between open or laparoscopic
 - 50% of fistula complex
 - 1/3 also ureteral reimplantation

Song 2011, Chapron 1996, Duong 2009, Mondet 2001



Disability and Litigation From Urinary Tract Injuries at Benign Gynecologic Surgery in Canada

Donna T. Gilmour, MD, and Thomas F. Baskett, MB

- Prevalence of UT injury 0.33%
 - But RR of 91 for litigation
- Only 18% of injuries recognized during surgery
 - Especially obstructed ureters or urinary tract fistulae are not recognized
- Fistula > 75% of lesions

Epidemiology

- Oncological fistula
 - Radical hysterectomy
 - Ureterovaginal fistula 1.4- 2.43%
 - VVF 0.3- 2.61%

Likic 2008; Baltzer 1980

Evidence statements

The risk of injury to the bowel or urinary tract and of subsequent fistula formation is higher in women with malignant disease undergoing radical surgery than in women with benign disease undergoing simple surgical procedures	3
Several modifications to convention radical hysterectomy are described, although they have not consistently been shown to mitigate this risk	3

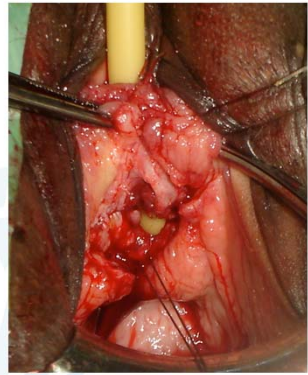
Epidemiology

- Irradiation
 - Higher in post-op EBRT then in brachytherapy
 - 1.9% vs 0.8%
 - No clear predictive factors

Kucera 1984; Biewenga 2010

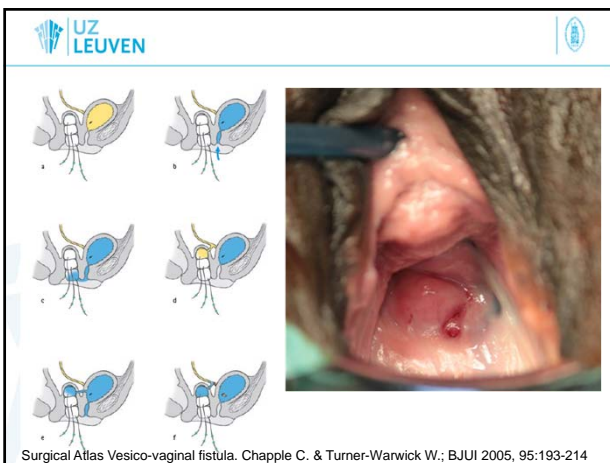
Evidence statements radiotherapy related fistula

The rate of fistula formation following radiotherapy for gynaecological cancer appears to be of the <u>same order</u> as that following surgical treatment	3
The risk of fistula formation following radiotherapy for locally <u>recurrent</u> malignancy is higher than following its use in primary disease	3
The use of neoadjuvant or adjuvant therapies is likely to be associated with a greater risk of fistula development than the primary treatment alone	3
The development of fistula following radiotherapy for primary treatment should trigger a search for evidence of tumour recurrence	4



Clinical diagnosis

- Location
- Size
- Urethral involvement
- Scarring
- Ureters
- Posterior wall



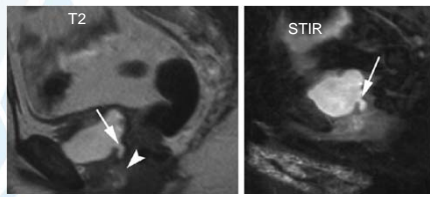
Surgical Atlas Vesico-vaginal fistula. Chapple C. & Turner-Warwick W.; BJUI 2005, 95:193-214

Fistulas in Malignant Gynecologic Disease: Etiology, Imaging, and Management

Priya Narayanan, MBBS, et al Radiographics 2009; 29:1073-1083

Magnetic resonance (MR) imaging and multidetector computed tomography (CT) are currently the imaging modalities of choice for the initial evaluation of patients in whom the presence of a pelvic fistula is suspected.

On T2-weighted images, the fistula is typically seen as a high-signal-intensity, fluid-filled communication. Short inversion time inversion-recovery (STIR) images may provide even more elegant depiction of a fistulous tract than conventional T2-weighted images.



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Conservative treatment

- Fresh fistula can close spontaneously with catheter
 - Only small fistula
 - Healthy well vascularized tissue
 - Max 4 weeks
 - If not healed, plan for surgical repair

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Surgical Atlas Vesico-vaginal fistula. Chapple C. & Turner-Warwick W.; BJUI 2005, 95:193-214

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Transperitoneal Laparoscopic Repair of Iatrogenic Vesicovaginal Fistulas: Heilbronn Experience and Review of the Literature

Ali Serdar Gözen, M.D., Dogu Teber, M.D., Abdullah Erdem Canda, M.D., and Jens Rassweiler, M.D.

Ref	Year	N	pt age	Fistula etiology	Preop cons Ts	Previous fistula repair	Mean op time (min)	Mean blood loss (ml)	Mean hosp stay (d)	Comp	Foley removal time (d)	Postop cysts	FU time (min)	Fistula recur
Our series	2007	3	41	Hyster	+	-	164	333	6	-	10	10	19	-
Duo Mahapatra ¹⁶	2007	12	34	Hyster (1) Obst (5)	NR	-	166	125	4	-	14	NR	12-36	+ ^a
Tavakoli ¹⁷	2007	1	44	Hyster	+	-	260	<100	1	-	21	21	6	-
Wong ¹⁸	2006	2	NR	Hyster	+	+ ^b	380	<100	2	-	21	21	40	-
Sato ¹⁷	2005	15	38	Hyster (14) Obst (1)	+	+ ^c	170	NR	3	+	10	10	26	+ ^d
Chaher ¹⁹	2005	8	NR	Hyster (6) Obst (2)	NR	NR	220	NR	10	-	14	14	3-40	-
Qu ²⁰	2004	2	NR	Hyster	+	-	NR	NR	2-12	-	14-20	10-20	NR	-

N=43!

JOURNAL OF ENDOUROLOGY
Volume 23, Number 3, March 2009

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Laparoscopic Ureteroneocystostomy and Psoas Hitch for Post-Hysterectomy Utererovaginal Fistula

Pranjal Modi,^a Rahul Gupta and S. J. Rizvi

TABLE 2. Intraoperative and postoperative data for 17 patients

	Mean (range)
Operative time (hrs) ^a	2.5 (1.9–2.8)
Blood loss (ml)	90 (60–150)
Time to oral intake (hrs)	8.2 (6.7–10.1)
Time to ambulation (hrs)	14 (9.2–18)
Hospital stay (days)	5.3 (5–7)
Time to nephrostomy removal (days)	7
Time to catheter removal (days)	7

Post-operatively
reflux 1/18
no obstruction

THE JOURNAL OF UROLOGY® Vol. 180, 615-617, August 2008

UZ LEUVEN

ROBOTIC REPAIR OF VESICOVAGINAL FISTULA: CASE SERIES OF FIVE PATIENTS

BALA M. SUNDARAM, GURU KALIDASAN, AND ASHOK K. HEMAL

5 patients

Operating time 223 min
FU 6 months

FIGURE 1. After adhesiolysis, bivalved bladder demonstrating fistulous communication between bladder and vagina. Large defect and 20F Foley catheter seen emerging through VF.

UROLOGY 67: 970–973, 2006. © 2006

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Robotic Reconstruction for Recurrent Supratrigonal Vesicovaginal Fistulas

Ashok K. Hemal,^a Surendra B. Kolla and Pankaj Wadhwa

Pt No.	Fistula Etiology	No. Prior Repairs (trans-obstetric/obstetric)	Max Size Last Repair (cm)	Fistula Size (cm)	Patient data					Hospital Stay (days)	Blood Loss (ml)	Catheterization Duration (days)
					Cystourethroscopy + Overall Healing of Cystourethritis	Albendazole + Docking	Albendazole + Dissection	Stenting + Overall Interposition	Overall			
1	After hysterectomy	2 (2/0)	4	2	20	15	20	05	4	100	14	
2	After hysterectomy	2 (2/0)	6	1.5	15	10	40	05	3	100	14	
3	After hysterectomy	1 (1/0)	12	2.8	15	15	45	00	2	100	14	
4	After hysterectomy	1 (1/0)	7	2.5	15	10	45	05	2	100	14	
5	Obstetric	2 (1/1)	4	4	20	10	60	20	3	80	14	
6	Obstetric	0 (0/0)	6	3.2	20	10	40	45	3	120	14	

Bladder closure

Our experience suggests that robotic repair for recurrent VVF is feasible, results in low morbidity and provides outstanding results. Robotic assistance facilitates adhesiolysis, fine dissection through fibrosis to preserve the flap blood supply, and more rapid and easier closure of wide gaps in the bladder and vagina with tissue interposition. It appears to be an attractive, minimally invasive option for primary or recurrent VVFs that are suitable for repair by an abdominal approach.


N=7

THE JOURNAL OF UROLOGY®
Vol. 180, 961-965, September 2008

UZ LEUVEN

Robotic-Assisted Uterovaginal Fistula Repair: Report of Efficacy and Feasibility

Rajesh Laungani, MD,¹ Nilesh Patil, MD,¹ Louis S. Krane, MD,¹ Ashok K. Hemal, MCh,² Sahabuddin Raja, MD,² Mahendra Bhandari, MD,¹ and Mani Menon, MD¹

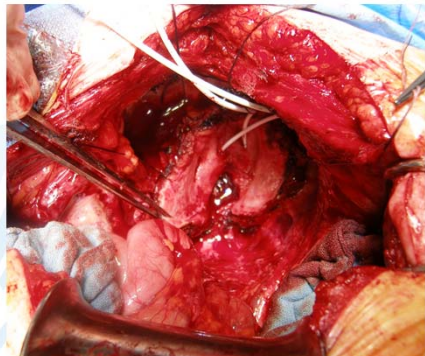


Age (years)	Side	Etiology of injury	Diagnostic imaging	Time from diagnosis to surgical repair (days)	EBL (mL)	Operative robotic console time (min)
50	left	TAHBSO	CT	14	52	62
66	left	TAHBSO	IVP	20	64	121
57	left	TAHBSO	IVP	69	102	118

JOURNAL OF LAPAROSCOPIC & ADVANCED SURGICAL TECHNIQUES
Volume 18, Number 5, 2008

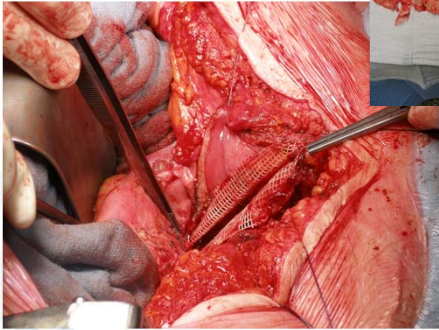

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Vesico-perineal fistula after radiotherapy



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Mesh erosion into bladder and uterus

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Vesicovaginal fistula repair using tunneled gluteal cutaneous fat-pad flap

Ashish V. Choudhrie · Ajit J. Thomas · Ganesh Gopalakrishnan



Fig. 1 Tongue-shaped gluteal cutaneous fat pad flap with the base towards the labium

Fig. 2 The flap tunneled under the labia and vaginal mucosa, insetted and sutured to vaginal mucosa

Int Urogynecol J (2009) 20:121–122

Radiation fistula

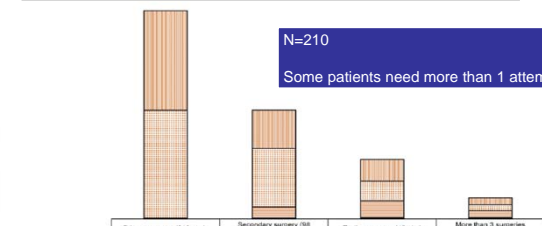
Whilst diversion is used more widely in radiation-associated fistulae of all types, there is low level evidence that repair procedures can achieve successful fistula closure and continence in appropriately selected cases	C
Where urinary and/or faecal diversion is required, attempts should be made to avoid using irradiated tissues wherever possible, and to minimise the potential for anastomotic complications	C
There is low level evidence to support the use of interposition grafts when repair of radiation-associated fistula is undertaken	C
In patients with intractable urinary incontinence from radiation-associated fistula, where life expectancy is very short, ureteric occlusion might be considered; there is insufficient evidence to recommend any particular technique	D

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Management of Radiation-Induced Vesicovaginal Fistula

Dmitri Y. Pushkar*, Vladimir V. Dyakov, Gevorg R. Kasyan

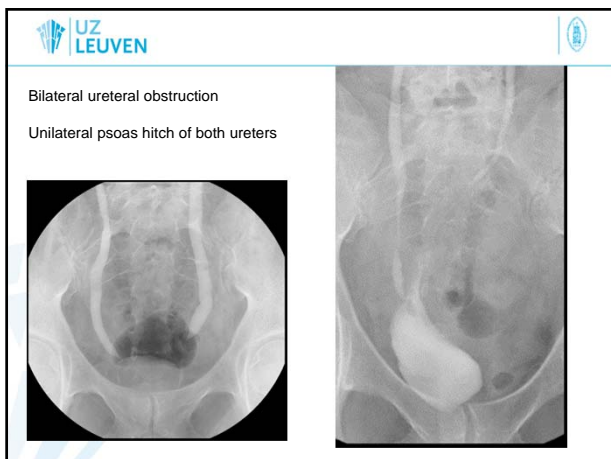
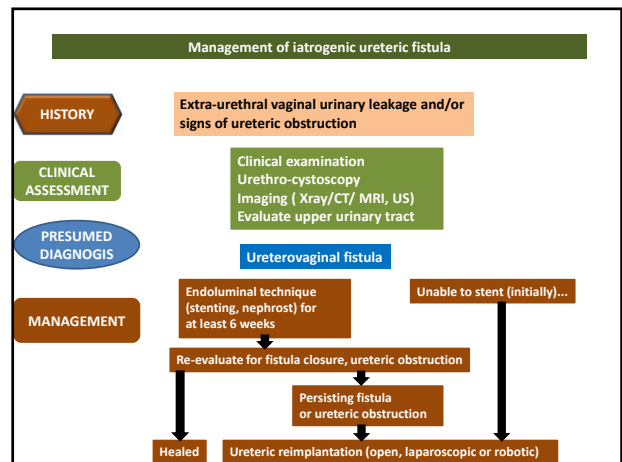
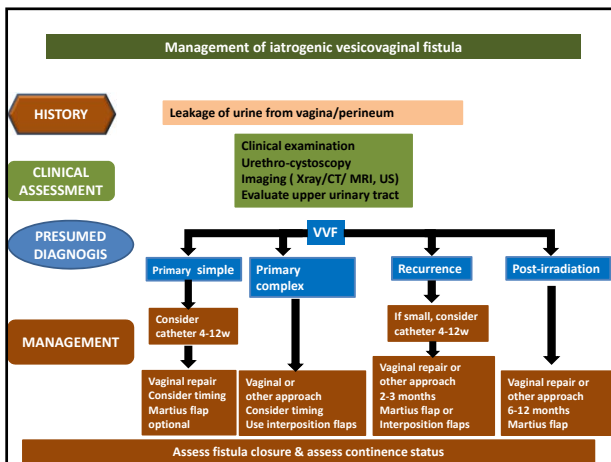
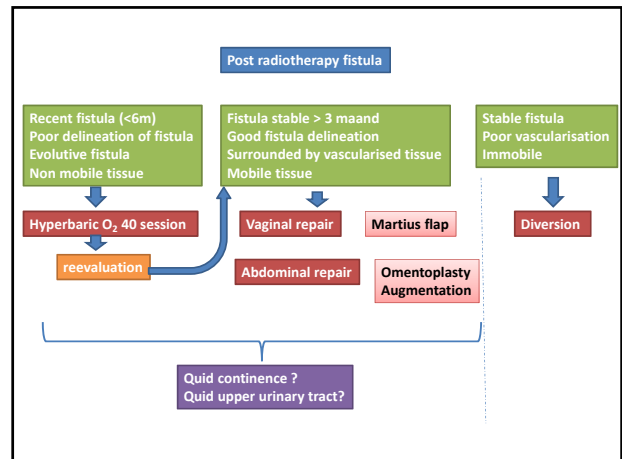
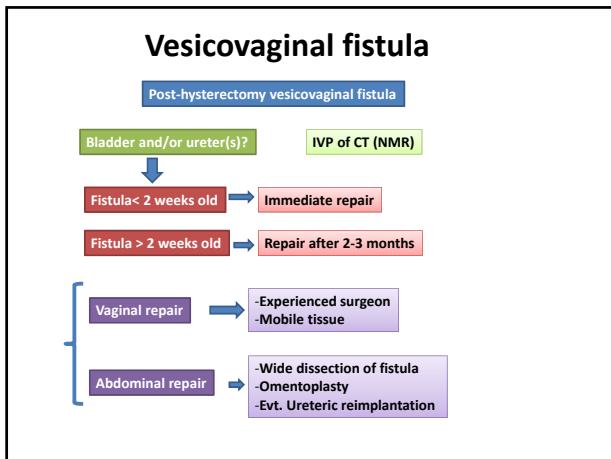
N=210
Some patients need more than 1 attempt



	Primary surgery (210 pts.)	Secondary surgery (98 pts.)	Tertiary surgery (42 pts.)	More than 3 surgeries (13 pts.)
Successful closure of fistula	101	35	22	7
Failure	109	63	20	6
Revised surgery	2	11	17	7
Success rate on each stage	48.1%	33.8%	52.4%	53.8%
Cumulative success rate	48.1%	65.8%	77.1%	85.4%

Radiation-induced vesicovaginal fistulae are one of the most challenging problems in modern female urology. Martius labial flap and Latzko upper colposuspensory techniques are essential for urologists dealing with patients suffering from this problem.

EUROPEAN UROLOGY 55 (2009) 131–138



Ureterovaginal fistula

Recommendations	
Suspect fistula after pelvic surgery if fluid leak or renal dilatation occurs	A
Analyse fluid leak after pelvic surgery for creatinine level	A
Persistent ureterovaginal fistula should be repaired by open techniques	A
Laparoscopic or robotic treatment for persistent ureterovaginal fistula can be offered according to availability and competence	B
Surgeons should be competent at identifying, preserving and repairing the ureter	A
Do not use ureteric stents as prophylaxis	B
Conservative and endoluminal treatment as initial treatment	B

Ureteral Injury & Obstruction:

Risk factors: Hemorrhage, adhesions, and excessive use of cautery or blind clamping in the lower third of ureter should be specifically be avoided	2
It is recommended that routine identification and dissection of pelvic ureter be performed at the beginning of any difficult pelvic surgery	3
Pre operative intravenous urogram (IVU) does not aid in surgical management	4
Prophylactic Ureteric catheterization has not been shown to reduce the risk of ureteral damage in routine cases	4
Classification of the Injury: does not have any prognostic significance, however may be used to document the extent of damage and for comparison of data	3

COMPLICATIONS OF VV FISTULA REPAIR

Sherif Mourad, MD

Fistula Repair Surgery:

- ▶ Reconstructive surgery of vaginal fistula repair can mend the injury, and success rates are as high as 90 per cent for uncomplicated cases.
- ▶ Two weeks or more of post-operative care is needed to ensure a successful outcome.

Advantage of having the fistula fixed from first time?

- ▶ First repair success rate: 70–90%
- ▶ 2nd repair success rate: 50–60%
- ▶ > than 2 procedures: <40%

Are VVF results good right now?

- ▶ Success rate of uncomplicated → 70–80%
- ▶ Success rate of complicated VVF → 50–60%

Is there a room for improvement?

- ▶ Definitely yes:
 - Improve surgical skills.
 - Improve working environment.
 - Improve general condition of the patient.
 - New concepts → fibrin glue

Complications of Fistula and Repair

1. Recurrence/ Residual / De-Novo!! Fistulation.
2. Infections: wound, UTI and Pyelonephritis and Urosepsis
3. Voiding Dysfunction : Outlet obstruction (meatal stenosis, Urethral stricture, BNO)
4. Bladder contracture/dyfunctionalization
5. Ureteric obstruction
6. Sexual dysfunction
7. Vaginal Stenosis
8. Infertility
9. Neurological complications: Drop foot, Neuropathic Bladder
10. Psychological trauma

Remember

- ▶ Most complications are avoidable
- ▶ Best chance is the first chance

Re-Fistulation

Aetiology

- ▶ Ischemia/unhealthy tissues
- ▶ No interposition flaps
- ▶ Opposing suture lines
- ▶ Distal obstruction
- ▶ Bad drainage
- ▶ Infection
- ▶ Collection/hematoma
- ▶ Poor healing (general/local)

Simple fistulae:

- ▶ Uretero-vaginal
- ▶ Vesico-vaginal
- ▶ Recto-vaginal

Complicated fistulae:

- ▶ Vesico-uterine
- ▶ Uretero-vaginal
- ▶ Extensive sloughing of bladder mucosa & trigone
- ▶ Extensive scarring of vagina

Simple fistula (<3-4cm, urethra intact)

- ▶ First operation has the best chance
 - Closure rates 82,8% – 93%
- ▶ Wide mobilisation, identifying of the ureters, tension free repair
- ▶ Single layer absorbable sutures 4mm apart
- ▶ Catheter drainage 10–14 days
- ▶ Value of a Martius flap is questioned
- ▶ If an episiotomy is needed, adequate closure should be performed

WHO consensus meeting 2004, Hilton 1998, Nardos 2008, Goh 2008

Complex fistula

- ▶ Diameter > 3–4cm
- ▶ Urethral involvement
- ▶ Vaginal scarring
- ▶ Multiple or combined fistula
- ▶ Intravaginal ureters
- ▶ Circumferential fistula
- ▶ More difficult repair
- ▶ High postoperative incontinence rates 50–100%

Kelly 1193, Carey 2002, Murray 2002

Wound Infections

- ▶ Prophylaxis: asepsis, good debridement + limited tissue dissection and trauma, preop abs!!
- ▶ C.O.: Strept fecalis, Aneorobes, MRSA
- ▶ Discovery: pain, fever, redness, tenderness, discharge, odor...
- ▶ Treatment: Abs (C&S specific), local drainage, local agents...Diversion !!

Voiding dysfunctions

- Incontinence
- OAB
- Obstruction

Bladder Contracture

Rare

- Following repeated surgeries
- Long standing large fistulas (dysfunctionalized bladder)

Treatment

- Augmentation: ileocystoplasty ± continent cutaneous tube
- Others..??

Ureteric Obstruction

- Transfixing sutures during closure of fistulas near the or involving the trigone.
- May occur during Transvaginal or trans abdominal repair of VVF
- MANDATORY to stent both ureters prior to repair.

They are much closer than you think!!

Diagnosis

- Renal Pain
- Hydronephrosis

Treatment

- Early Diagnosis: (first few days) Explore...
- Later Divert and Manage Later...
- Is there a place for endoscopic treatment?

Sexual Dysfunction

- Dysparunia
- Poor excitation
- Delayed or absent orgasm

Vaginal Stenosis

Cause:

- ▶ Scarring and fibrosis

Treatment

- ▶ Dilatation
- ▶ Vaginolysis...
- ▶ Augmentation...
- ▶ Replacement...

Neurological Complications:

- ▶ Foot drop: is one of the tragic injuries associated with obstructed fistula, which was known as (obstetric palsy).
- ▶ Women with this condition are unable to dorsiflex the foot and therefore walk with a serious limp, dragging their injured foot.

Psychological Aspects

Should always be considered

- ▶ Preoperative Counseling...
- ▶ Postoperative Management
- ▶ REINTIGRATION +++

How to reduce your complications rate?

Objectives: Good Evaluation

- ▶ Site
- ▶ Size
- ▶ Number
- ▶ Fibrosis and Scarring
- ▶ Recurrence
- ▶ Involvement of ureteric orifices
- ▶ Involvement of sphincteric mechanism
- ▶ Associated vagino-rectal fistula.

Good Evaluation

- ▶ Site
- ▶ Size
- ▶ Number
- ▶ Fibrosis and Scarring
- ▶ Recurrence
- ▶ Involvement of ureteric orifices
- ▶ Involvement of sphincteric mechanism
- ▶ Associated vagino-rectal fistula.

Evaluation 2

- ▶ **Vaginal gauze test:**
 - Insert Vaginal gauze
 - Insert a Foley catheter and inflate the balloon.
 - Fill the bladder with methylene blue.
 - Pull on the Foley catheter.
- ▶ **Interpretation:**
 - Stained gauze → VVF
 - No staining → no VVF
 - Wet but not stained → ?? Uretero-vaginal fistula.

Size

- ▶ The bigger the size the more the fistula is complicated
- ▶ Larger fistulae → worse outcome → use tissue interpositioning
- ▶ Large fistulae repair → contracted bladder
- ▶ Cut-off size → 4cm ??

Number

- ▶ All fistulae should be recognized.
- ▶ Missing a fistulae → failure.

Surgical Tips to Avoid Complications of Vaginal Fistula Repair

Proper Examination

- ▶ Assurance
- ▶ Relaxation
- ▶ Gentle examination
- ▶ Size
- ▶ Location: High - Low
- ▶ Associated conditions: Prolapse - Urethra
- ▶ External Genitalia

Proper Approach

- ▶ Vaginal
- ▶ Abdominal
- ▶ Laparoscopic
- ▶ Urethral Re-Construction
- ▶ Anti- incontinence procedure
- ▶ POP repair

Recurrent Complicated Cases

- ▶ ? Urethral Injury
- ▶ ? Multiple fistulas
- ▶ Post operative Bladder capacity
- ▶ Possible augmentation
- ▶ Voiding Dysfunction

Proper Tissue Interpositioning

- ▶ Omental Flap
- ▶ Martius Flap
- ▶ Fibrin Glue

Use of Fibrin Glue in VVF

· Fibrin glues helps in:

- Hemostasis.
- Wound healing.
- Tissue adhesion.

· Fibrin sealants consist of the plasma derivatives at the end of the coagulation pathway.

(Thomas, 2003)

Packing

- ▶ 48 hours
- ▶ Minimize ambulation

Surgical guidelines

- ▶ Adequate exposure of the operative field.
- ▶ Repair :
 - Tension-free
 - Watertight and uninfected
- ▶ Minimize bleeding and haematoma.
- ▶ Avoid ureteral obstruction.
- ▶ Interposition flap if required.
- ▶ Highest success (1st attempt)

Other factors

- ▶ Involvement of sphincteric mechanism → anti-incontinence procedure later.
- ▶ Associated Vagino-rectal fistulae → should be repaired spontaneously ± colostomy.

TAKE HOME MESSAGE

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ASSESSMENT

- ▶ Careful clinical examination will allow the type of fistula to be determined, although no generally accepted classification system is available.
- ▶ Key items are the size and location of the fistula, the extent of the involvement of the urethra and the urethral closure mechanism, and the amount of vaginal scarring. (Grade B)

Recurrent Vaginal Fistula:

- The treatment for complex and recurrent vesicovaginal fistula is surgical repair and should be done by expert surgeons using tissue interpositioning or fibrin glue. (Grade A)
- There is no significant difference between trimming or not trimming the edges of the fistula after dissection. (Grade A)

OAB and Contracted Bladder:

- OAB and Urodynamic Stress Incontinence postoperatively showed significant improvement with the use of antimuscarinics. (Grade B)
- Contracted bladder can be a cause of persistent incontinence after successful closure of the fistula. (Grade C)

Urethral Shortening/ Disruption:

- Treatment of urethrovaginal fistula is always surgical and needs special surgical techniques and tissue interpositioning. (Grade B)
- If the *urethra* and/or the *urethral closure mechanism* is involved, a *sling procedure*, using an autologous pubovaginal sling, should be performed at the same time as the fistula correction. (Grade C)
- There is *no place for synthetic sling* material in this setting. (Grade B)

Ureteral Injury & Obstruction:

- ▶ Risk factors: Hemorrhage, adhesions, and excessive use of cautery or blind clamping in the lower third of ureter should be specifically avoided – EL 2
- ▶ Pre operative intravenous urogram (IVU) does not aid in surgical management – EL 4
- ▶ Prophylactic Ureteric catheterization has not been shown to reduce the risk of ureteral damage in routine cases – EL 4

Vaginal Scarring & Sexual Dysfunction/ Dyspareunia:

- ▶ Symptoms of sexual dysfunction are common following fistula repair surgery, and may have a significant impact of the quality of life for many women. [EL4]
- ▶ Further research is required into the optimal management of vaginal scarring/obliteration at the time of initial repair surgery. [EL4]

Neurological Complications:

- ▶ Most of the studies show that the patients recover some or all of their nerve function spontaneously within two years of the injury however 13% show persistent sign of nerve injury. (Grade B)
- ▶ Physiotherapy and the use of posterior tibialis tendon transfer is a well established procedure for the patients of fistula with foot drop. (Grade C)

