



Vaginal Fistulas; Lessons Learned

W21, 15 October 2012 14:00 - 18:00

Start	End	Topic	Speakers
14:00	14:20	Introduction and Overview	<ul style="list-style-type: none"> • Sherif Mourad
14:20	14:40	Epidemiology of Vaginal Fistulas	<ul style="list-style-type: none"> • Sohier Elneil
14:40	15:00	Anatomic Aspects & Aetiology	<ul style="list-style-type: none"> • Hassan Shaker
15:00	15:20	Classification of Vaginal Fistulas	<ul style="list-style-type: none"> • Edward Stanford
15:20	15:30	Discussion	All
15:30	16:00	Break	None
16:00	16:20	Surgery for Low Vaginal Fistulae	<ul style="list-style-type: none"> • Dirk de Ridder
16:20	16:40	Surgery for High Vaginal Fistula	<ul style="list-style-type: none"> • Sohier Elneil
16:40	17:00	Laparoscopic/Robotic Surgery for Vaginal Fistula Repair	<ul style="list-style-type: none"> • Hassan Shaker
17:00	17:20	Ureterovaginal, uterovaginal and other rare cases	<ul style="list-style-type: none"> • Dirk de Ridder
17:20	17:40	How to Treat Complications of Fistula Repair	<ul style="list-style-type: none"> • Sherif Mourad
17:40	18:00	Discussion	All

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.

Educational Objectives

Attendees will be able to learn more about the anatomical relations and why different types of fistula may occur and the strategy of repair. This is important to understand the different approaches and avoid complications.

Classification of the vaginal fistulae, how to differentiate between one fistulae and the other, and how to diagnose it will be presented with details.

Attendees will be able to see the different techniques of repair including the tips and tricks of both low and high vaginal fistulae repair and the interposing tissues. This will allow attendees to find out different techniques used for different forms of fistulae including robotic surgeries and other reconstructive procedures for the urethra or ureters.

Attendees will get oriented with the possible complications that may appear after fistula repair. The different problems and persistent leakage or de novo overactive bladder or ureteric injuries and others will be discussed in details. This will enable the audience to know how to deal with every possible complication.

At the end of the course the attendees will have the time to discuss all the aspects of the fistula problems with the speakers and to exchange knowledge with others.






Vaginal Fistula; Lessons Learned

Workshop # 00 / Monday, 15 October 2012 14:00 – 18:00

Time	Time	Topic	Speaker
14.00	14.15	Introduction & Overview	Sherif Mourad
14.15	14.30	Epidemiology Of Vesicovaginal Fistula	Suzy Elneil
14.30	14.45	Anatomical Aspects & Etiology	Hassan Shaker
14.45	15.00	Classification of Vaginal Fistulae	Edward Stanford
15.00	15.15	Discussion	All
15.30	16.00	Coffee Break	
16.40	17.00	Surgery for Low Vaginal Fistulae	Dirk De Ridder
17.00	17.20	Surgery for High Vaginal Fistula	Suzy Elneil
17.20	17.40	How to Treat Complications of Fistula Repair	Sherif Mourad
		Discussion	All

Vesicovaginal Fistula in the Disadvantaged, An Overview

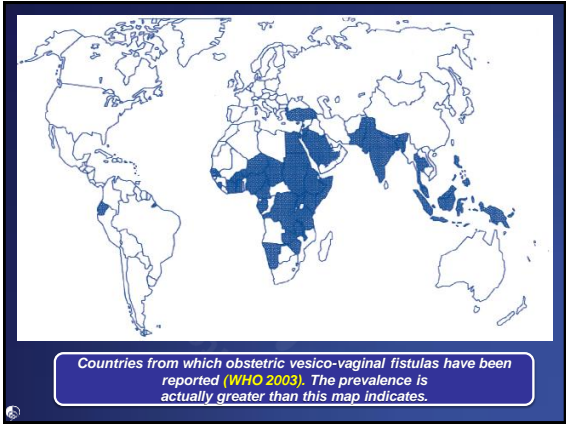


SHERIF MOURAD, MD
 Professor of Urology, Ain Shams University, Cairo
 President of African Fistula & Continence Society
 Chairman of ICS Fistula Committee

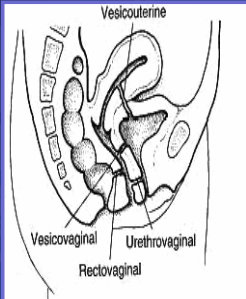
Introduction

- 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.



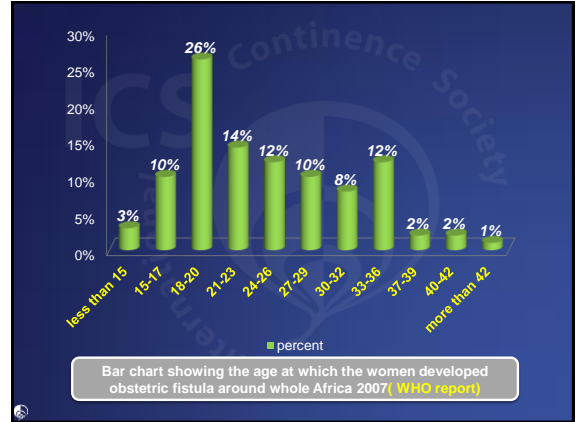
Types of Urogenital Fistula

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

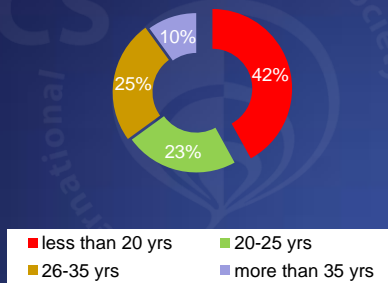


Etiology in Developing Countries

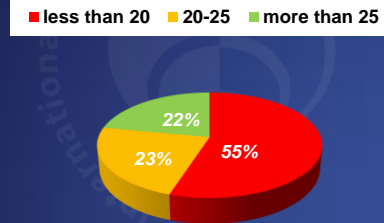
- Marriage and conception at a young age, often before full pelvic growth has been achieved.
- Chronic malnutrition limits pelvic dimensions, increasing the risk of cephalopelvic disproportion and malpresentation.
- Few attendances by qualified health care professionals or having access to medical facilities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



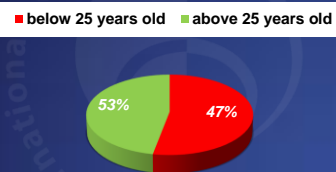
Percentile chart of V.V.F cases in relation to age in Ethiopia in 2005



Percentile chart of V.V.F cases in relation to age in Nigeria (UNFPA report)



Age of genitourinary fistulae cases in Ghana 2007 (UNFPA report)



• 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

•VVF is mainly due to inadvertent bladder injury during pelvic surgery (90%).

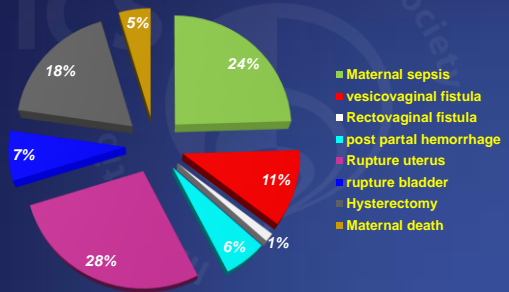
•Bladder wall injury from electro-cautery or mechanical crushing, and the dissection of the bladder into an incorrect plane, causing avascular necrosis.

•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.

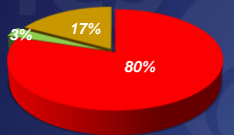
The time of clinical presentation depends on the etiology of the VVF:

- 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.

Maternal complications of obstructed labor, in Adigrat zonal Hospital in Northern Ethiopia, 1993-2001



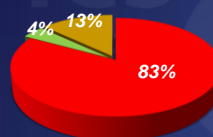
Causes of V.V.F in South Africa 2001-2006



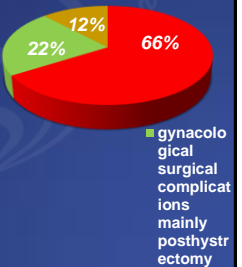
Causes of V.V.F in Ghana in 2007



Percentile chart of causes of V.V.F in Nigeria in 2006 (UNFPA report)



Causes of V.V.F in India 2007 (UNFPA report)



Possible Social Consequences

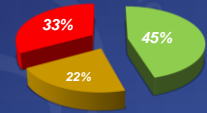
- Stigma and discrimination.
- Social isolation.
- Community/familial rejection.
- Divorce or abandonment.
- Verbal and Physical Abuse.
- Loss of income, extreme poverty.



Marital status after genitourinary fistulae around Africa, 2007 (UNFPA report)



Social effect of V.V.F in Ethiopia between 2001-2005



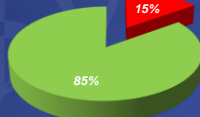
- deserted by husband
- deserted by husband and begging food
- get support from husband & family

Marital status of cases after affection with genitourinary fistula in Nigeria (prepared by grassroots health organization of Nigeria) (2005)



- divorced
- get family support

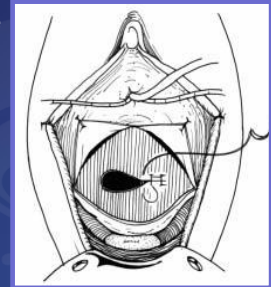
Social effect of the V.V.F cases in Zambia, 2005 (Birmingham University and Maternity unit, Monze, Southern province, Zambia)



- divorced
- still married

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

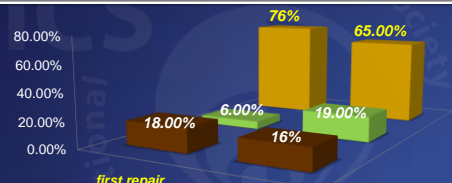


Fistula Cure

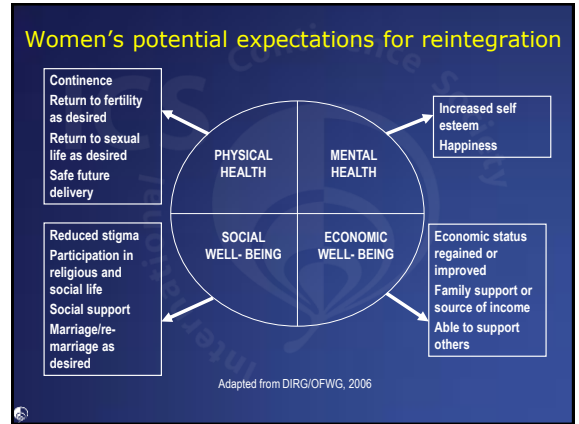
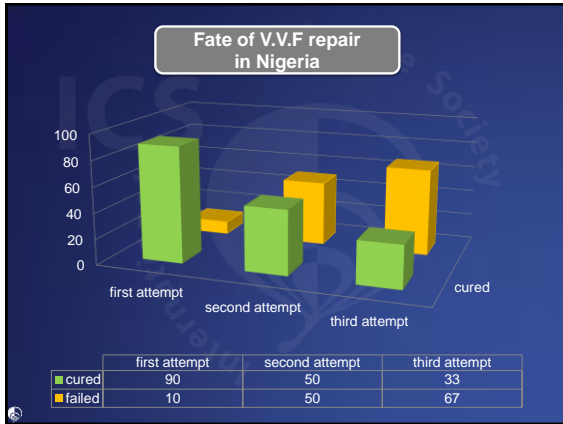
For a 100% cure; the following conditions must be fully satisfied:

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

Outcome of surgery by repair attempt in Zambia, 2005 (source : Maternity Unit, Monze Mission Hospital, Monze, Southern Province, Zambia Department of Public Health and Epidemiology, The Medical School, University of Birmingham)



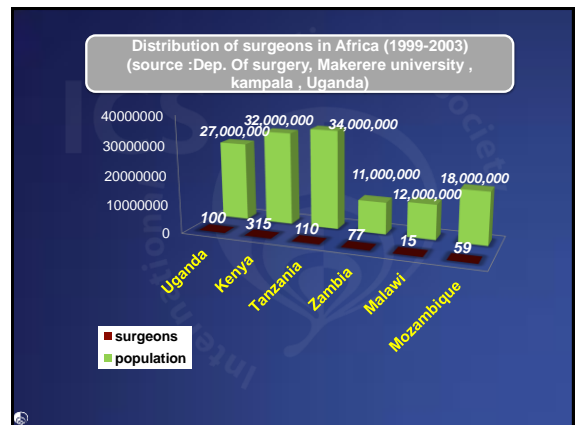
- stress incontinence
- failed
- cured



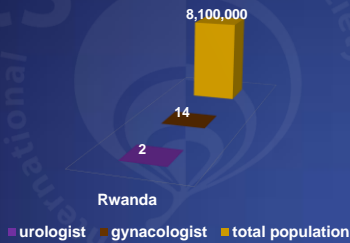
- ### Challenges in surgery in Africa as seen by surgeons
- Severe shortage of surgeons.
 - Poor conditions of service / Poor salaries; unclear career structure.
 - Concentration of surgeons in towns and cities 80 – 100% in urban areas where only 5 -15% of populations lives.
 - Limited opportunities 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.

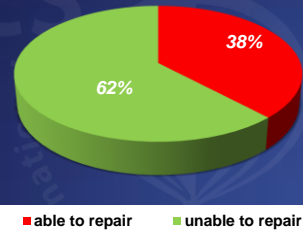
- ### Challenges in surgery in Africa as seen by surgeons:
- Poor maintenance of available equipment.
 - Poor or lack of specialized investigations e.g. CT SCAN, MRI etc.
 - Shortage of consumables .
 - Lack of communication facilities/knowledge .
 - Shortage of blood supply.
 - Absence of high care ward.
 - Fluctuating power supply.
 - Lack of funds for research.



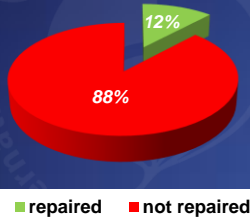
Prepared by UNFPA country office and Engender Health under support of Columbia university ,2004



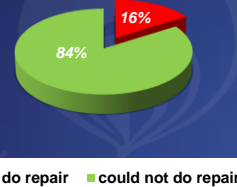
Percentile chart of cases that able to do repair in Nigeria



Liability of repair of V.V.F cases according to cost of repair in Uganda ,2007



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



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

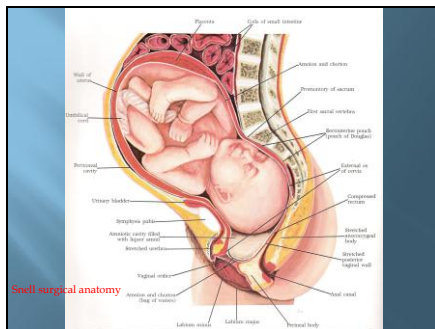
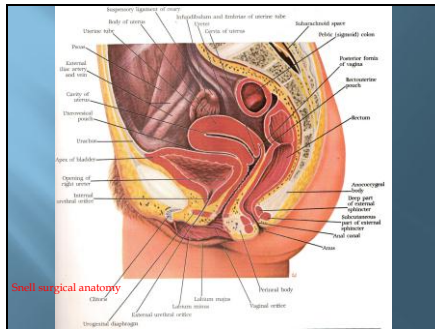
Genital tract fistulas remain a significant problem in the developing world. We need more information about the women suffering this condition, to understand how to better impact and improve on their quality of life. We need to engage the women, their families, their society and their governments to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

REFERENCES

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ANATOMY PERTAINING TO VESICOVAGINAL FISTULA

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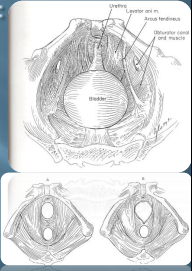
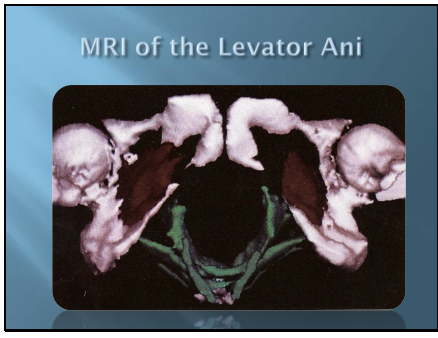


Anatomy of pelvic support

- ▣ Muscular support:
Pelvic diaphragm.
- ▣ Fascial support:
Endopelvic fascia.

I) Muscular support: Pelvic Diaphragm

- ▣ Levator Ani
 - Pubo-coccygeus
 - Ilio-coccygeus
 - Ischio-coccygeus
- ▣ Coccygeus

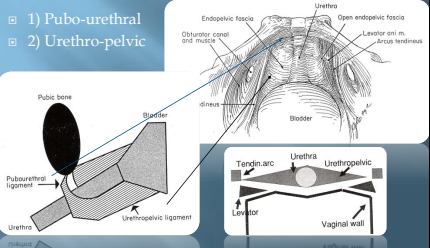



II) Fascial Support: Endopelvic fascia

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

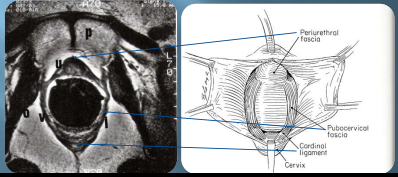
Endopelvic fascia

- ▣ 1) Pubo-urethral
- ▣ 2) Urethro-pelvic



Endopelvic specialized fasciae. Cont.

- 3) Vesico-pelvic fascia.
- 4) Cardinal ligament.



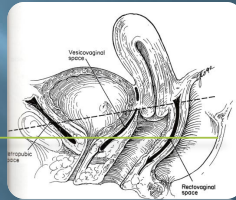
The Urethro-pelvic Fascia



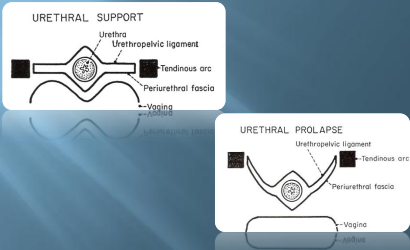
Physiology of female continence

•Proximal Half of the urethra:
•Intra-abdominal
•passive continence

•Distal half of the urethra:
•Area of sphincteric activity
•Active continence



Defects in the pelvic fasciae: 1) Urethro-pelvic fascia

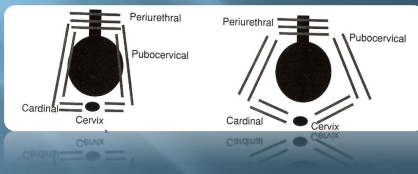


Defects in the pelvic fasciae: 2) Vesico-pelvic fascia

- 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):

Defects in the pelvic fasciae: 3) Cardinal ligaments

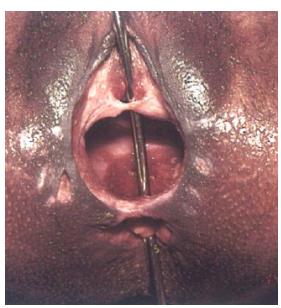
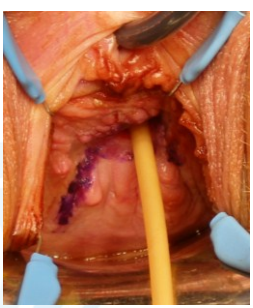
- Uterine prolapse
- Cystocele

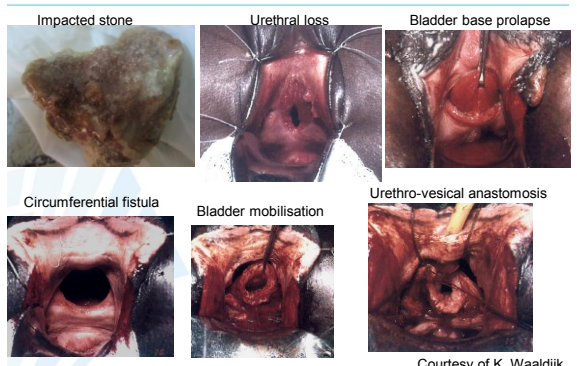




- **The obstructed labor complex**
 - Delay in deciding to seek help
 - Delay in arriving at the health care facility
 - Delay in receiving adequate care
- **(Sexual abuse, rape, accidents)**
- **(Traditional practices)**
 - Gishiri cutting, infibulation
- **Injuries sustained during operative interventions**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







Courtesy of K. Waaldijk

Vesicovaginal fistula

AFRICA

- Etiology
 - Obstetric etiology
 - Sexual aggression
 - Traditional practices
- Large series
- Basic surgical repairs
 - Simple >80%
 - Complex >50%
- Prevention as biggest challenge

EUROPE

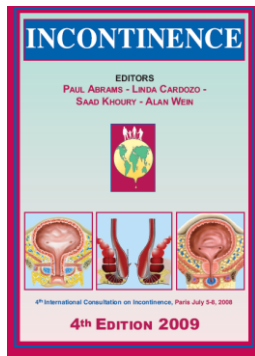
- Etiology
 - Iatrogenic
 - Radiation induced
 - Litigation
- Small series
- Complex surgical procedures
 - Outcome >90%
- Avoiding litigation and achieving 100% success

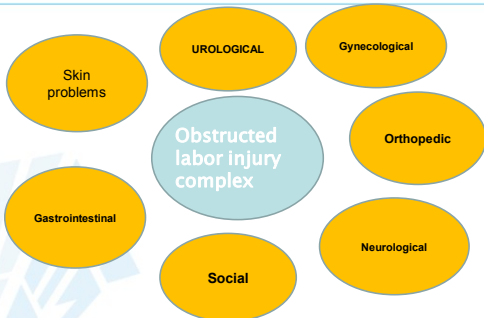
Committee 18

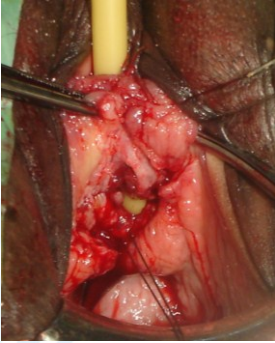
Fistulas in the Developing World

Chairman
D. De Roox (Belgium)

Members
G. H. BADLAN (USA),
A. BROUWING (Ethiopia),
P. SINGH (India),
I. SOMBE (Burkina Faso),
L. L. WALL (USA)

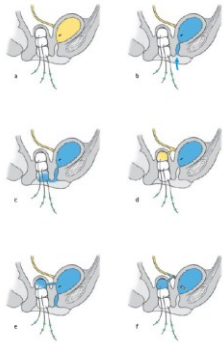




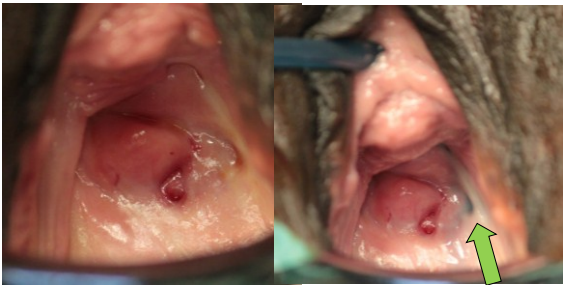


Clinical diagnosis

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



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



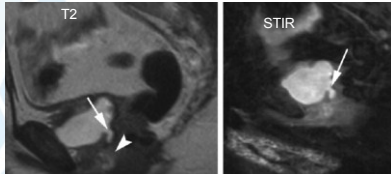
Fistulas in Malignant Gynecologic Disease: Etiology, Imaging, and Management

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.

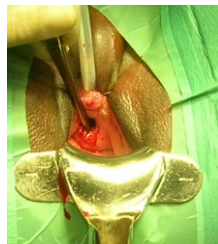
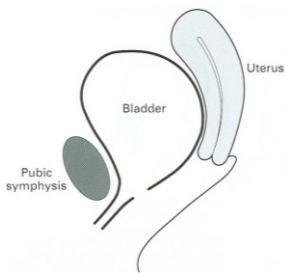
On T2-weighted images, the fistula is typically seen as a high-signal-intensity, fluid-filled communication. Short inversion time inversion-recovery (STIR) images may provide even more elegant depiction of a fistulous tract than conventional T2-weighted images.



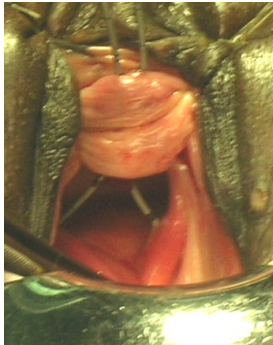
Clinical examination under anesthesia



Simple, accessible fistula



Complex fistula
-Circumferential lesion
-Urethral loss



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

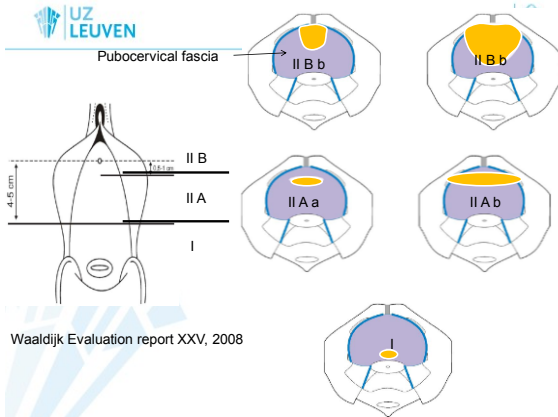
- ▶ Diameter > 3-4cm
- ▶ Urethral involvement
- ▶ Vaginal scarring
- ▶ Multiple or combined fistula
- ▶ Intravaginal ureters
- ▶ Circumferential fistula
- ▶ More difficult repair
- ▶ High postoperative incontinence rates 50-100%

Kelly 1193, Carey 2002, Murray 2002

Prevalence

Type	Description	Nigeria	Congo
I	Urethra not involved	18.4%	46%
II A a	Closing mechanism involved without urethral involvement, no circumferential defect	37.2%	16.5%
II A b	circumferential	30.7%	8.5%
II B a	With urethral involvement, not circumferential	5.2%	14%
II B b	circumferential	3.2%	13%
III	Ureter fistulas & exceptional fistulas	0.9%	2%

In Congo most women undergo cesarean section, which leads to another distribution of the fistula types



Surgical principles

type	bladder/urethra direction of closure	pubocervical fascia	ant vagina wall closure
type I	any according to common sense	no special measures	adaptation
type II Aa	transverse	transverse repair (+ fixation)	transverse adaptation
type II Ab	circumferential end-to-end	refixation	transverse adaptation
type II Ba	longitudinal (+ transverse) urethra tissue	fixation	flap
type II Bb	longitudinal + circumferential nonurethra tissue	refixation	flap

Waldijk 2008

Relation to outcome

results as to fistula type in 1,716 consecutive early closure patients (1992-2001)

type	number	healed first attempt	final healing	incontinent
type I	243	238 (97.9%)	242 (99.6%)	1 (0.4%)
type II Aa	888	868 (97.4%)	888 (100%)	11 (1.2%)
type II Ab	366	333 (91.0%)	353 (96.4%)	30 (8.5%)
type II Ba	87	80 (96.4%)	86 (98.9%)	14 (16.3%)
type II Bb	132	114 (86.4%)	121 (91.7%)	59 (48.8%)

6.8%

Waaldijk 2008

Predicting the risk of failure of closure of obstetric fistula and residual urinary incontinence using a classification system

Judith T. W. Goh - Andrew Browning -
Brahma Berhan - Allan Chang

Int Urogynecol J (2008) 19:1659-1662

	Closed/failed	Continent/incontinent after fistula closure
Total (n=987)	960/27	731/229
Type of fistula (type 1-4)	$p=0.77$	$p<0.001$
Type 1 (n=356)	346/10	335/11
Type 2 (n=182)	179/3	143/36
Type 3 (n=171)	166/5	111/55
Type 4 (n=278)	269/9	142/127
Size of fistula (a-c)	$p=0.35$	$p=0.08$
Size a (n=247)	241/6	215/26
Size b (n=245)	244/1	190/54
Size c (n=495)	475/20	326/149
Special considerations (i-iii)	$p=0.04$	$p<0.01$
i (456)	447/9	412/35
ii (137)	134/3	101/33
iii (394)	379/15	218/161

- Epidemiology
- Etiology
- Diagnosis
- Classification
- Treatment
- Prevention
- Organisation of fistula care

Conservative treatment

- Fresh fistula can close spontaneously with catheter
 - Only small fistula
 - Healthy well vascularized tissue

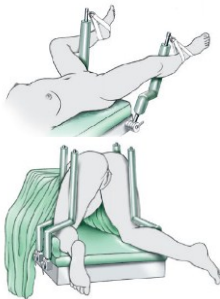
Surgical repair

- **Definition of success?**
 - Successful closure of the fistula?
 - Successful treatment of the entire obstructed labor injury complex?
 - Persisting incontinence after successful closure
- **Timing of operation**
 - 3 months?
- **Preferably vaginal approach under spinal anesthesia**

Waalwijk 1994, Inipavudu 2007, Chigbu 2006

Abdominal of vaginal approach

- Most fistula can be closed vaginally
 - Minimally invasive
 - Short procedure time
 - High success rate in trained hands
- Abdominal approach for high fistula and some complex fistula
 - Need for omentum, augmentation etc...
 - Depending on your training
- Laparoscopy/ Robot
 - experimental



Our Experience with Genitourinary Fistulae

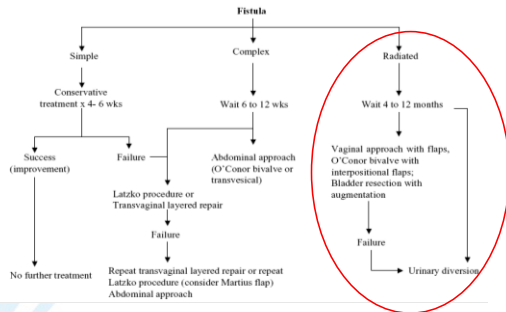
Abhay Kumar Neeraj K. Goyal Suren K. Das Sameer Trivedi Udai S. Dwivedi Pratap B. Singh

Method of repair	Patients	Failures
Transvaginal layered closure	42	2 (4.7)
Transvaginal layered closure with vaginal flap reinforcement	20	1 (5)
Martius flap repair	35	0
Transabdominal layered closure	93	2 (2.1)
Transabdominal layered closure with ureteric reimplantation	15	0
Bladder mucosal autograft	32	3 (9.3)
O'Conor's repair	42	1 (2.3)
O'Conor's repair with ureteric reimplantation	16	1 (6.2)
Free peritoneal graft	27	3 (11.1)
Ileum patch repair	40	2 (5)
Combined abdominal and vaginal approach	35	2 (5.3)
Ureterosigmoidostomy	4	0
Ileal conduit	2	0
Total	395	17 (4.3)

Urol Int 2009;82:404-410

Guidelines of how to manage vesicovaginal fistula

Roberto Angioli^{a,*}, Manuel Penalver^b, Ludovico Muzii^a, Luis Mendez^b, Ramin Mirhashemi^b, Filippo Bellati^a, Clara Crocè^a, Pierluigi Benedetti Panici^a



Critical Reviews in Oncology/Hematology 48 (2003) 295-304

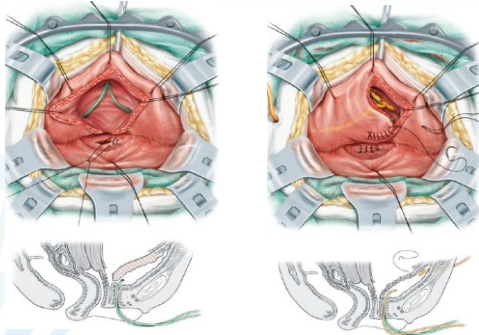
Guidelines of how to manage vesicovaginal fistula

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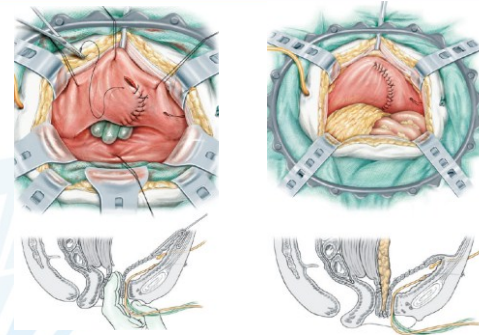
Radicated vesicovaginal fistulae results by treatment

Approach	Authors	Year	Number of patients	Success rate	Procedure
Abdominal	Wies [19]	1980	5	4 (80%)	Abdominal
	Gil-Vernet [18]	1989	3	3 (100%)	Vesical autoplasty; transvesical extraperitoneal or transperitoneovesical
	Bissada [41]	1992	1	1 (100%)	Combined gastric and omental segment based on R gastroepiploic
	Sahaj [24]	1994	1	1 (100%)	Bivalve; rectus abdominis myofascial flap
	Vinimas [25]	1995	1	1 (100%)	Transvesical rectus abdominis myocutaneous flap (skin lined the bladder inner wall)
Vaginal	Collins [42]	1960	5	2 (40%)	Vaginal
	Borawski [22]	1986	6	3 (50%)	Martius flap
	Zoske [23]	1989	4	2 (50%)	Martius flap
	Eltan [24]	1990	5	5 (100%)	Modified Martius flap
Combined	Menachem [7]	1990	2	2 (100%)	Excision of fistula; rectus abdominis muscle flap
	Mina [43]	1994	4	4 (100%)	Seromuscular autovaginal graft (SMAG)

N=37 from 1980-1995 for 11 authors!



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



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

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

All Serdar Gözen, M.D., Dogu Teber, M.D., Abdullah Erdem Candu, M.D., and Jens Rassweiler, M.D.

Ref	Year	N	Mean pt age	Fistula etiology	Preop com Tx	Preopus fistula repair	Mean op time (min)	Mean blood loss (mL)	Mean Mars long stay (d)	Foley removal time (d)	Postop catheter time (d)	FLI (pts)	Fistula recur
Our series	2007	3	41	Hyster	+	-	164	333	6	-	10	19	-
Das Mahapatra ¹⁶	2007	12	34	Hyster (7) Obst (5)	NR	-	166	125	4	-	14	NR	12-36
Tanaka ¹⁷	2007	1	44	Hyster	+	-	260	<100	1	-	21	21	8
Wong ¹⁸	2008	2	NR	Hyster	+	+	380	<100	2	-	21	21	40
Saadi ¹⁹	2009	15	38	Hyster (1) Obst (1)	+	+	170	NR	3	+	10	10	28
Chabber ¹⁸	2005	8	NR	Hyster (5) Obst (2)	NR	NR	220	NR	10	-	14	14	5-40
Ooi ²⁰	2004	2	NR	Hyster	+	-	NR	NR	2-12	-	16-20	10-20	NR

N=43!

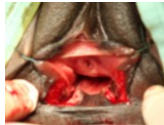
JOURNAL OF ENDOUROLOGY
Volume 23, Number 3, March 2009

Vaginal Fistula repair

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

Gaining access and exposure

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

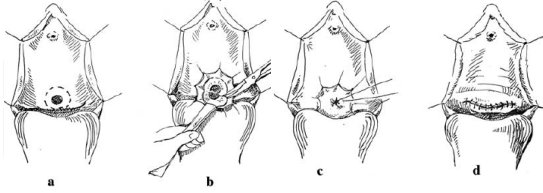


Incisions

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

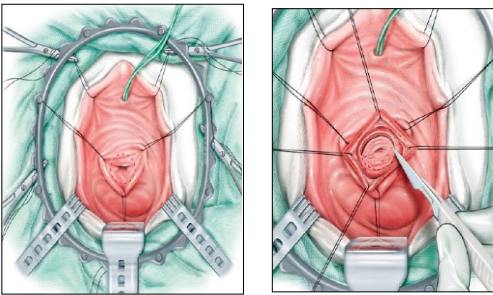
Latzko repair for vesicovaginal fistula revisited in the era of minimal-access surgery

Lalgudi Narayanan Dorairajan · Nikhil Khattar · Santosh Kumar · Bipin C. Pal

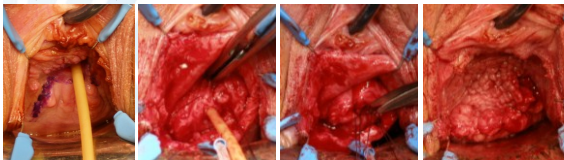
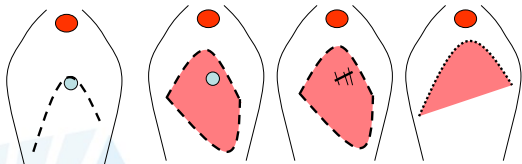


Int Urol Nephrol (2008) 40:317-320

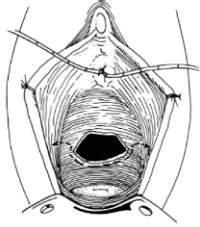
Circumferential incision



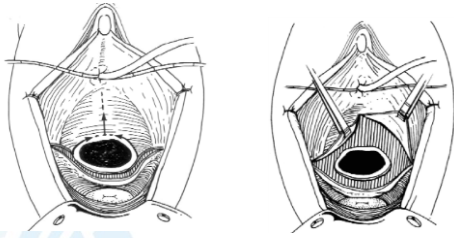
J shaped incision



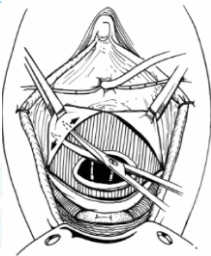
Identify ureters if needed and possible and catheterize them



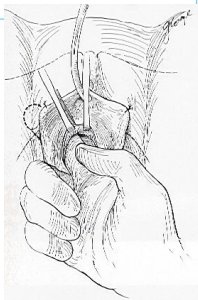
Horizontal incision at fistula base

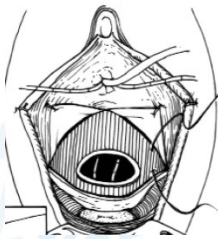


Anterior dissection as wide as needed



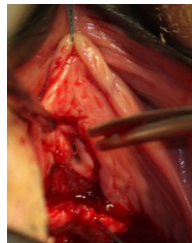
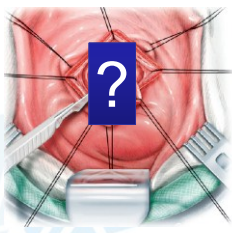
Entering Retzius' space if needed





Tension free closure of pubocervical fascia

Supporting stitches or sling procedure



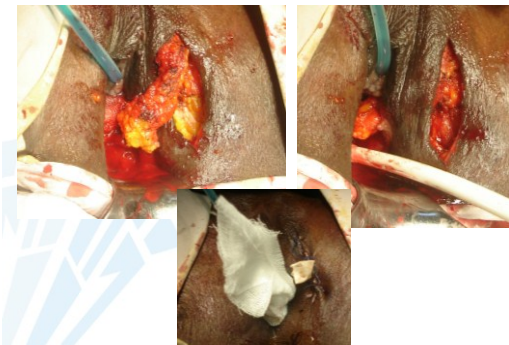
Surgical Atlas Vesico-vaginal fistula. Chapple C. & Turner-Warwick W.; BJUI 2005, 95:193-214
 Sheriff Mourad et al. 2010

Closure of the fistula

- No need to resect the fistula tract !
- Absorbable sutures 2/0
- Strong bites in pubocervical fascia, 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



Complex fistula

► **Postoperative incontinence**

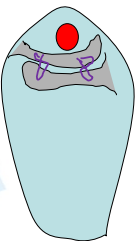
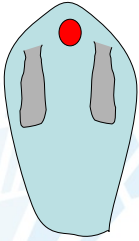
- Urethral involvement OR 8.4
- Large size: for each cm OR 1.34
- Vaginal scarring OR 2.4
- Low bladder capacity OR 4.1

► **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

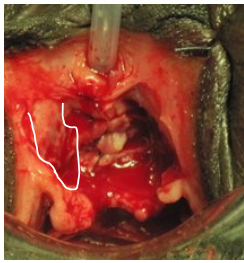
Suburethral fibro-muscular sling



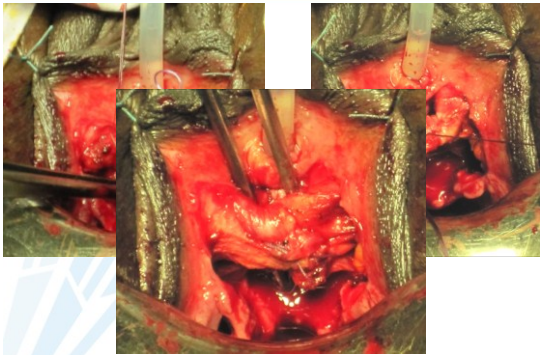
- Bilateral lateral vaginal wall tissue
- Vascular
- bring over midline and suture



Urethra without support



Dissection of fibromuscular flap





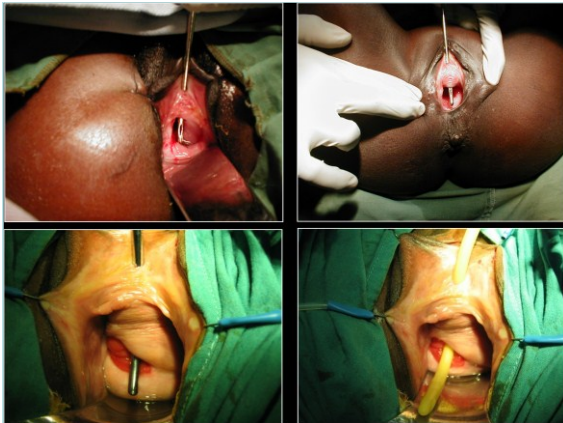


Ureterovaginal, uterovaginal and other rare fistula

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

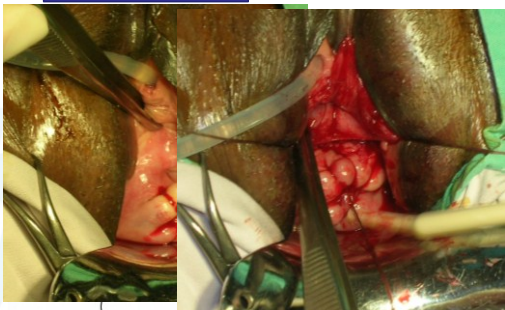


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Utero-vesical fistula



Epidemiology of iatrogenic fistula

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

Lee 1988

Continuous discharge from vagina or wound / decreased urine output should raise strong suspicion of an obstetric fistula	3
Routine inspection to assess integrity of ureter in difficult cases with extensive adhesions, bleeding, and in individuals with difficult access is recommended	2
If injury is suspected dissection of the ureter should be performed if necessary aided with retrograde passing of a stent or injection of indigo carmine dye to localise the site of injury	3
Routine use of Cystoscopy to check ureteric integrity is cost effective in complex cases and very difficult dissections	3

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

Dapang Rao · Haifeng Yu · Haiho Zhu · Ping Duan

41/25987= 1,6/1000

Bladder injuries

Types of operation	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

Ureteric injuries

Types of operation	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

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

Sang Wook Bai · Eun Ha Huh · Da Jung Jung · Joo Hyun Park · Koon Ho Rha · Sei Kwang Kim · Ki Hyun Park

Urinary tract injuries during pelvic surgery: incidence rates and predisposing factors

Abstract Objective: To review the cases of urinary tract injury following major pelvic surgery that were treated in our hospital over the last 12 years, in relation to possible predisposing factors and incidence rates of injury arising in various surgical procedures. **Materials and methods:** From 8,824 major gynecological operations performed in our department, 29 cases of intraoperative urinary tract injury were found. Thirty eight patients visited the urology department during the same period for the management of urogenital fistula following pelvic surgery. Parameters that were examined included type of urinary tract injury, indication for surgery, type of operation, coexisting pathological conditions, past history of pelvic surgery or pelvic irradiation, and the delay in the recognition and management of the urinary tract injury. **Results:** The overall incidence of urinary tract injury in pelvic surgery was 0.33%. The incidence of urinary tract injury in radical hysterectomy was higher than that of total abdominal hysterectomy (0.76 vs 0.26%). Of the intraoperative urinary tract injuries, 48.4% coexisted pelvic pathologies. Of all the cases with urinary

tract injury, the most common type of operation was total abdominal hysterectomy (n=45, 67.2%), and the most common indication was uterine myoma (n=25, 36.9%). The most common type of urinary tract injury was bladder injury, including bladder laceration and vesicovaginal fistula (n=57, 76.1%). The frequency of reoperation was found to be lower in patients with a shorter delay in the recognition of the injury (p<0.05). **Conclusion:** Possible predisposing factors for urinary tract injury are coexisting pelvic adhesion, distortion of normal pelvic configuration, previous irradiation history, previous operation history, and the extent of surgery. In high-risk patients, proper evaluation is needed to avoid urology complications before operation.

Keywords Urinary tract injury · Pelvic surgery · Predisposing factors

Introduction

The female genital and urinary tracts are anatomically

Risk factors

- Cancer
- inflammation
- endometriosis
- previous surgery
- radiation therapy
- cervical myomas
- Broad ligament myoma
- inadequate incision
- inadequate retraction
- inadequate lighting
- inexperienced Surgeon

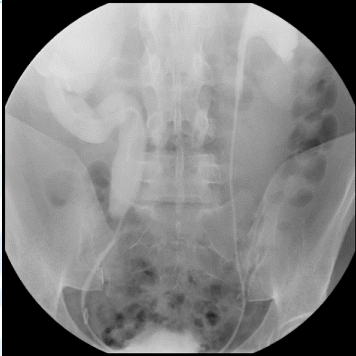
Ureterovaginal fistula

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

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

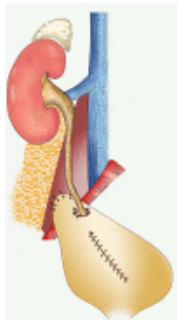
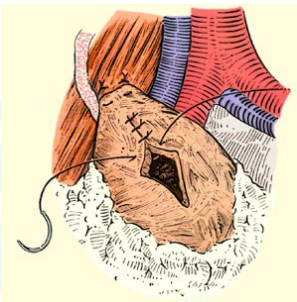




Bilateral ureteral obstruction
Unilateral psoas hitch of both ureters



PSOAS HITCH



Urethrovaginal fistula

Traumatic	Iatrogenic	Medical
Direct trauma	Bulking agents	Beçhet's disease
Foreign body	Sling surgery	
	Urethral diverticula repair	
	Catheterisation	
	Irradiation	

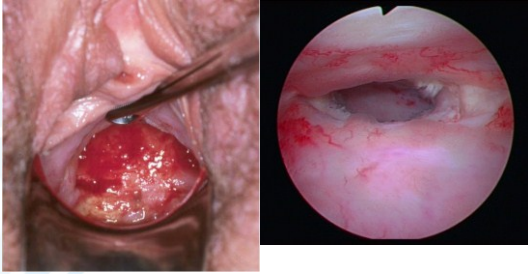
Succes rates

Author	N patients	Success at first surgery	Success at second surgery	
Blaivas	24	79%		
Goodwin	24	70%	92%	
Lee	50	92%	100%	
Keetel	24	87.5%		
Pushkar	71	90.1%	98.6%	52% incontinent
Benckekroun	186	53%		Mostly obstetrical
Henriksson	6	67%	100%	
Kumar	43	95.4%	100%	

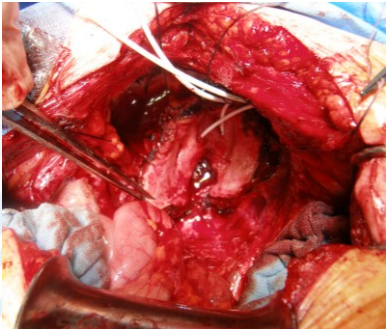
Urethrovaginal fistula

Urethrovaginal fistula repair may necessitate secondary surgery	C
A vaginal approach to urethrovaginal fistula repair is most commonly used	C
Post-operative stressincontinence can occur despite successful fistula closure	C
A vaginal advancement flap is sufficient to cover the fistula closure site, but low level evidence exists that pedicled vaginal skin and bulbocavernosus flaps can be used as alternatives or when there is considerable tissue loss and in urethral reconstruction	C
Although only low level evidence exists, the Martius flap is commonly used as interposition material to protect the fistula closure site	C
Alternative autologous interposition material can be used	D

Radiation fistula



Vesico-perineal fistula after radiotherapy



Epidemiology

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

Kucera 1984; Biewenga 2010

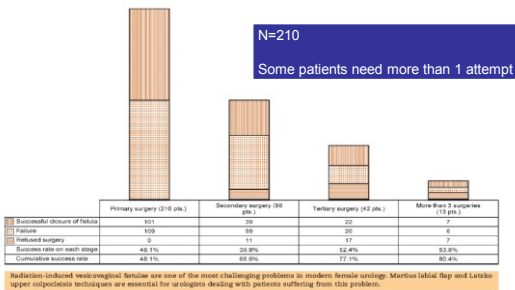
Evidence statements radiotherapy related fistula	
The rate of fistula formation following radiotherapy for gynaecological cancer appears to be of the same order as that following surgical treatment	3
The risk of fistula formation following radiotherapy for locally recurrent malignancy is higher than 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

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

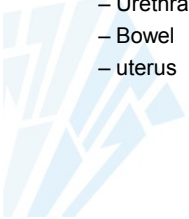
Management of Radiation-Induced Vesicovaginal Fistula

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

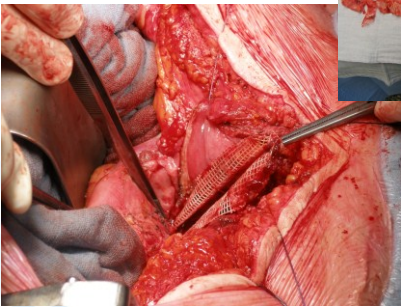


New type of fistula

- Mesh and sling related fistula
 - Bladder
 - Urethra
 - Bowel
 - uterus

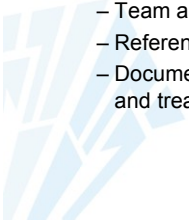


Mesh erosion into bladder and uterus



Conclusions

- Rare and complex fistula can be difficult to treat
 - Team approach
 - Reference centers
 - Document all steps in the decision making and treatment



Complications of VV Fistula Repair

Sherif Mourad, MD

Why Should we improve our skills?

1. Do we really need more fistulae surgeons?
2. Any advantage of having the fistula fixed from the very first time?
3. Are VVF repair results good right now?
4. Is there any room for improvement?

Do we really need more fistulae surgeons?

- ▶ Problem Magnitude:
 - WHO 2003 estimation:
 - 2 million women with VVF
 - 50-100 thousands are affected yearly.
- ▶ Treatment → surgical
- ▶ Waiting time:
 - 1-2 years
- ▶ Training programs for fistulae surgery



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



Neurology and Urodynamics

Fibrin Glue Versus Martius Flap Interpositioning in the Repair of Complicated Obstetric Vesicovaginal Fistula. A Prospective Multi-Institution Randomized Trial

Ahmed Safan, Hassan Shaker, Abdalla Abdelal, M. Sherif Mourad, and Mohammed Albaz
Urology Department, Ain Shams University, Cairo, Egypt

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)

Treatment... Prophylaxis

Cause	Avoid
Ischemic -unhealthy edges	Debridement, wait for 3 months, freshen edges
Opposing suture lines/No flaps	Avoid opposing sutures + FLAPS can help
Faulty Suture	Type: Absorbable PGA or monofilament, Size: , Pattern: Cont or Interrupted!!
Suture under tension	Never
Bad Drainage	Adequate caliber, good material, frequent check, acidification
Distal Obstruction	Check the outlet!!
Poor Healing	General condition/Nourishment/Hg/Albumin
Hematoma	Hemostasis
Infection	Sterile before/Perioperative umbrella/minimal tissue handling.

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

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?

Bladder Contracture

Rare

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

Treatment

- ▶ Augmentation: Ileocystoplasty ± continent cutaneous tube
- ▶ Others..??

Voiding Dysfunction

Type	Aetiology	Treatment
ISD – Sphincteric Incontinence	Direct injury from trauma, from repair	Injections, Tapes, PVS
UUI –Vesical incontinence	Small bladder, DO, UTI, (2ry to BOO).	The cause: Abs, AntiMusc, Botox, Augmentation
Freq–Urgency	UTI, OAB, small bladder	Abs, Ams, Augmentation
Obstruction	Stricture, infection, ischemia, iatrogenic, Slings	Release, urethrolisis, meatoplasty, Urethroplasty

Sexual Dysfunction

- ▶ Dysparunia
- ▶ Poor excitation
- ▶ Delayed or absent orgasm

Vaginal Stenosis

Cause:

- ▶ Scarring and fibrosis

Treatment

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

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.

Evaluation 1

History:

- Etiology
- Time of occurrence
- Attempts of repair.
- Co-morbidities.

Examination:

- Palpate anterior and posterior wall
- Use speculum.



Evaluation 2

Vaginal gauze test:

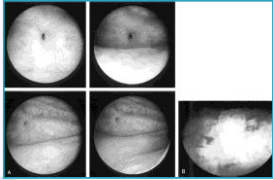
- Insert Vaginal gauze
- Insert a Foley catheter and inflate the balloon.
- Fill the bladder with methylene blue.
- Pull on the Foley catheter.

Interpretation:

- Stained gauze → VVF
- No staining → no VVF
- Wet but not stained → ?? Uretero-vaginal fistula.

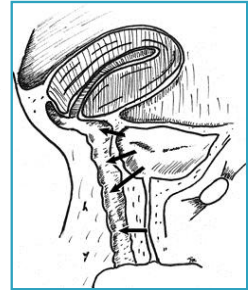
Evaluation 3

- ▶ **Cystogram** → of limited value.
- ▶ IVP → only if uretero-vaginal fistula is suspected.
- ▶ **Cystoscopy very valuable:**
 - Site of fistulae
 - No of fistulae
 - Involvement of ureteric orifices



Site

1. Supratrigonal
2. Trigonal
3. Involving bladder neck
4. Involving urethra



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.

Simple fistulae:

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

Complicated fistulae:

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

Surgical Tips for Vaginal Fistula Repair

Proper Examination

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

Proper Approach

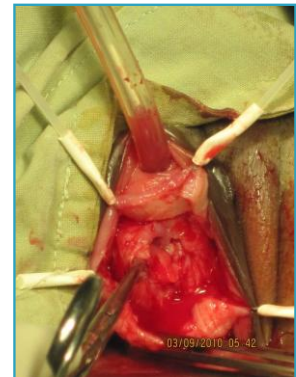
- Vaginal
- Abdominal
- Laparoscopic
- Urethral Re-Construction
- Anti- incontinence procedure
- POP repair

Huge Fistulas:



- Secure both ureters with ureteric catheterization

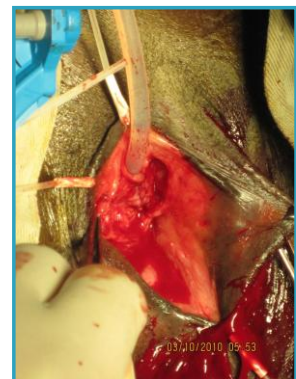
Proper Dissection



Recurrent Complicated Cases

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

Proper Closure



Proper Tissue Interpositioning

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

Use of Fibrin Glue in VVF

- .Fibrin glues helps in:
 - Heamostasis.
 - 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.



Notes

Record your notes from the workshop here