

ΚΑΚΏΣΕΙΣ ΚΑΤΩΤΕΡΟΥ ΟΥΡΟΠΟΙΗΤΙΚΟΎ ΣΥΣΤΗΜΑΤΟΣ

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BLADDER TRAUMA

70-97% of the bladder injuries associated pelvic fracture

RISK FACTORS

- Full bladder
- RTA
- Suprapubic penetrating injury

AETIOLOGY

- External trauma 82%
- Iatrogenic 14%
 - Obs/Gynae
 - Urological
 - Orthopaedic
- Intoxication 2.9%
- Spontaneous <1%

CLINICAL FEATURES

- Frank haematuria 82%
- Abdo tenderness 62%
- Perineal, scrotal, thigh or ant abdo wall swelling
- NB wrt intraperitoneal rupture, beware shoulder tip pain, anuria, peritoneal signs, uroascites

CLASSIFICATION & MECHANISM

- Intraperitoneal / Extraperitoneal
- Blunt / Penetrating

INVESTIGATIONS

- Urinalysis – haematuria present in 95%
- Cystogram

CYSTOGRAM OF INTRAPERITONEAL BLADDER RUPTURE. THE
CONTRAST ENTERS THE INTRAPERITONEAL CAVITY AND
OUTLINES LOOPS OF BOWEL



CYSTOGRAM OF EXTRAPERITONEAL BLADDER RUPTURE. NOTE THE FRACTURED PELVIS AND CONTRAST EXTRAVASATION INTO THE SPACE

OF RETZIUS



NB'S

- US – no role
- IVU – no role
- MRI – no role
- CT – unreliable
 - Can use CT cystogram but must use dilute contrast here
- If too unstable for cystogram, inspect at time of laparotomy

INTRAPERITONEAL RUPTURE - MANAGEMENT

- Cardiorespiratory resuscitation
- I.V. antibiotics – at induction and when cath being removed
- Supine position, lower midline incision
- Laparotomy to assess injuries – deal with others first
- Washout
- Single or double layer closure of bladder
- Postop cystogram at 10 days – 0.5% show leak ?consensus whether you should do

EXTRAPERITONEAL RUPTURE - MANAGEMENT

- *Aetiology*
 - 89-100% association with pelvic fractures
 - Iatrogenic
- *Management*
 - 20-22F catheter for 7-10 days + antibiotics
 - Approx 90% heal in 10 days
 - EXCEPTIONS
 - Bladder neck involvement
 - Bone in bladder wall
 - Bladder wall entrapment
 - Injury to vagina/rectum
 - Persistent bleeding
 - Open ortho repair

IATROGENIC INJURIES

- TURBT
- Caesarean Section
- (Vesicovaginal fistulae)
- Laparoscopy 0.02-8.3%
- Hysterectomy 1.1%
- Instrumental delivery
- TVT 6-30%

OUTCOME

- Generally excellent
- *Beware*
 - Undiagnosed uroascites may cause respiratory compromise
 - Unrecognised intra-abdominal leak may lead to peritonitis / loculated abscess formation
 - Improper repair of concomitant vaginal injuries may lead to fistula formation
 - Small proportion develop neuropathic bladder & require ISC

ΚΑΚΩΣΕΙΣ ΟΥΡΗΘΡΑΣ



Anterior Urethral Injury Classification

- Partial disruption
- Complete disruption

Aetiology

- Blunt Trauma
 - Fall astride
 - Kick to perineum
 - Penetrating Trauma
 - Gunshot wound
 - Stab wound
 - Sexual Trauma
 - Foreign body
 - Penile fracture
 - Constriction Band
 - Iatrogenic
 - Urethral catheter
 - Endoscopic surgery
- c. Penile Surgery

Diagnosis

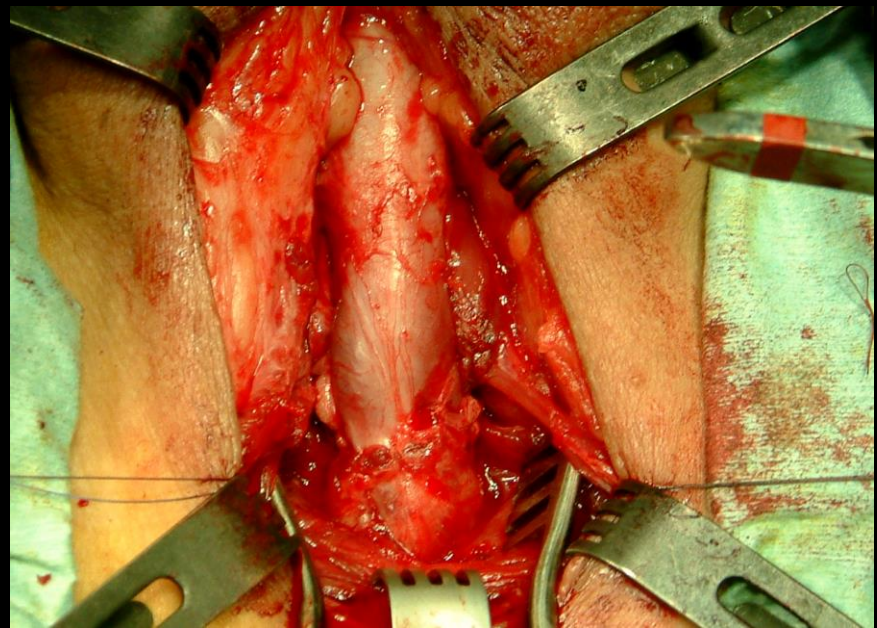
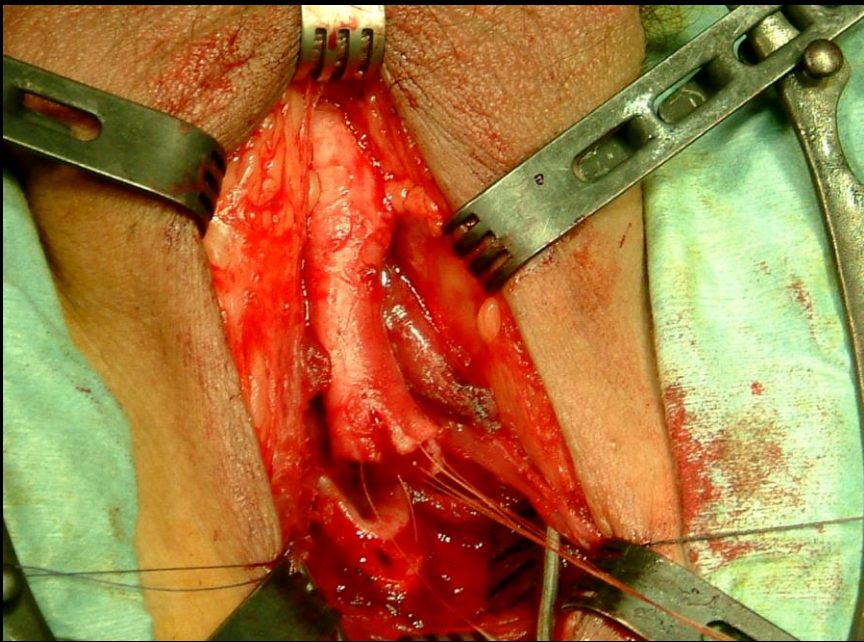
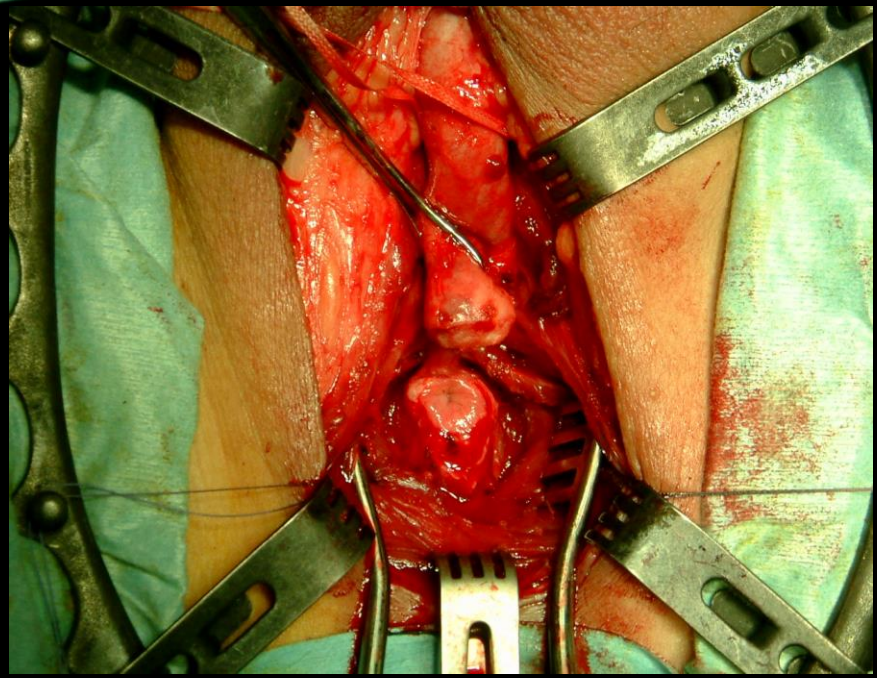
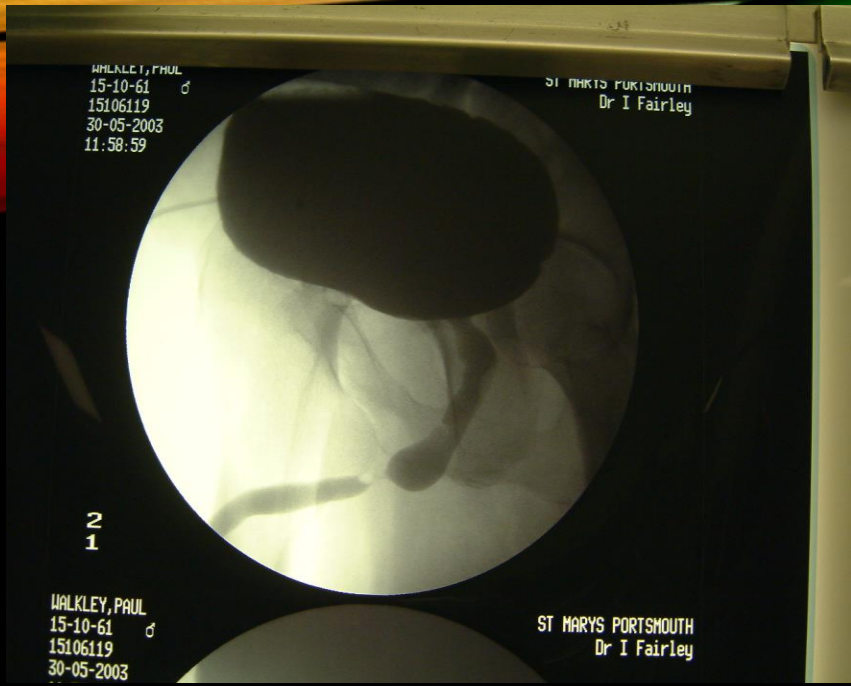
- History
- Blood at meatus
- Inability to void
- Haematoma or urinoma confined to Bucks or Colles fascia

Initial Management

- 1 gentle attempt at urethral catheterisation
- SPC if fails
- Immediate debridement if penetrating injury

Definitive Management

- Delayed repair of any stricture at minimum 3 months
- Urethroplasty determined by site and length of stricture





POSTERIOR URETHRAL INJURY

CLASSIFICATION OF URETHRAL INJURY

1. Partial disruption
2. Complete disruption
3. Complex (involving the bladder neck or rectum)

AETIOLOGY

1. Penetrating Trauma
 - a. Gunshot wound
 - b. Stab wound
2. Pelvic Fracture Related Trauma
 - a. RTA
 - b. Fall from height
 - c. Industrial accident
3. Iatrogenic
 - a. TURP, BNI
 - b. Other endoscopic surgery
 - c. Radical prostatectomy



Pelvic Fracture Urethral Distraction Defect

AETIOLOGY – PELVIC FRACTURE

- MVA motorists – 60%
- MVA pedestrians – 15%
- Falls
- Crush injuries
- 10% isolated, 90% associated injuries

MECHANISM OF PFUDD

- Avulsion of fixed membranous urethra from more mobile bulbar urethra by vertical force

INITIAL EVALUATION

Suspect PFUDD if;

- blood at the meatus
- difficulty or inability to void
- a palpable bladder
- high-riding prostate on DRE
- pelvic fracture with displacement of pubic rami or butterfly bruising of the perineum consistent with haematoma confined to Colles fascia.

INITIAL TREATMENT

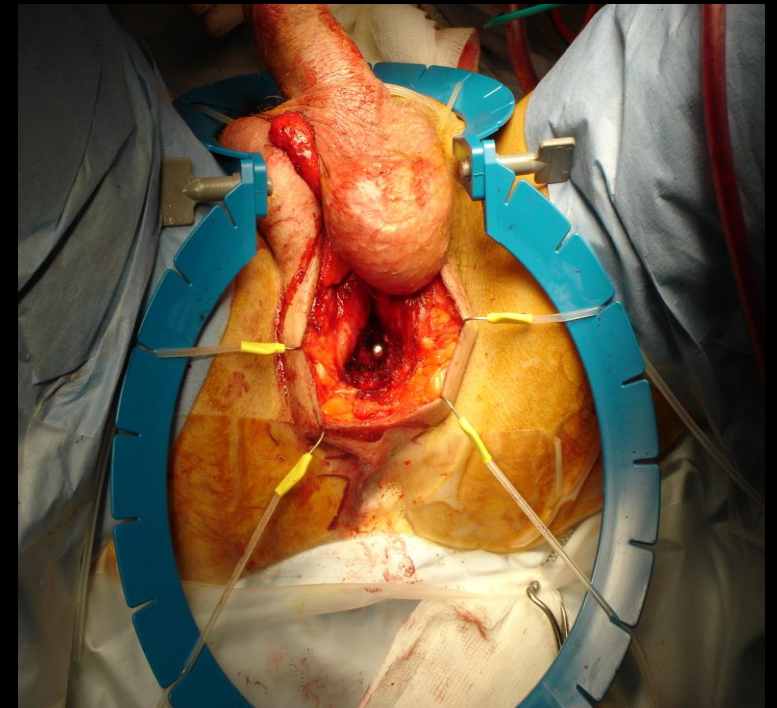
- 1 gentle attempt at urethral catheterisation reasonable
- SPC if fails
- Retrograde urethrogram in stable patient



MANAGEMENT OF URETHRAL INJURIES

Immediate Exploration and Repair: Indications

- Severe injury of proximal bulb/prostatic urethra
- Bladder neck injury
- Rectal injury



MANAGEMENT OF URETHRAL INJURIES

- Primary surgical repair
- Primary endoscopic repair
- Insertion of suprapubic catheter and delayed endoscopic repair
- Insertion of suprapubic catheter and delayed BPA.

MANAGEMENT OF URETHRAL INJURIES

The mean restructure, ED and UI rates after each are:

- Primary surgical repair 62%, 31% and 15%
- Delayed primary surgical repair 20%, 71% and 0%
- Delayed endoscopic repair 82%, 35.7% and 4.8%
- Delayed BPA 16.7%, 13.7% and 9.1%.
- ED rates consequent to fracture alone are 33-50%.

PENILE TRAUMA

The background features several flowing, translucent ribbons of color. At the top, a ribbon transitions from yellow to orange to red. At the bottom, a ribbon transitions from red to orange to yellow to green to blue. The ribbons have a slight 3D effect and are set against a solid black background.

TYPES OF INJURY

- Avulsion/Amputation
- Penile Skin loss
- Penile Fracture
- Suspensory ligament injury

PENILE AVULSION/AMPUTATION

Causes

- Assault
- Self Inflicted

Principles

- Amputated part wrapped in sterile bag
- Micro-surgical attachment within 24 hours
- Failure/Non viability- Delayed reconstruction with skin grafting or radial artery forearm free flap















PENILE SKIN LOSS

Principles of Management

- Wide spectrum anti-biotics
- Tetanus Toxoid
- Early Exploration
- Excision of necrotic material
- Copious Irrigation
- Check for organ damage

PENILE SKIN LOSS

- Primary closure for small lacerations
- Clean wound with large loss of skin- skin grafting
- Contaminated wound or large loss of skin
Mobilisation with delayed closure or split thickness skin graft



PENILE FRACTURE

- Fracture of the corpus cavernosum
- Occurs during sexual intercourse

History

- Vaginal intercourse is the most common cause (33–58%)
- Usually the patient reports that during aggressive intercourse the penis slips out of the vagina and thrusts against the perineum or symphysis pubis.
- ?After masturbation

PENILE FRACTURE

Clinical Features

Rupture of the Tunica Albuginea

- Pain
- Swelling and bruising to penile shaft (egg plant deformity)
- Defect in Tunica (rolling sign)
- Blood at urethral meatus/Urinary retention
(Urethral injury reported in approximately 20%)

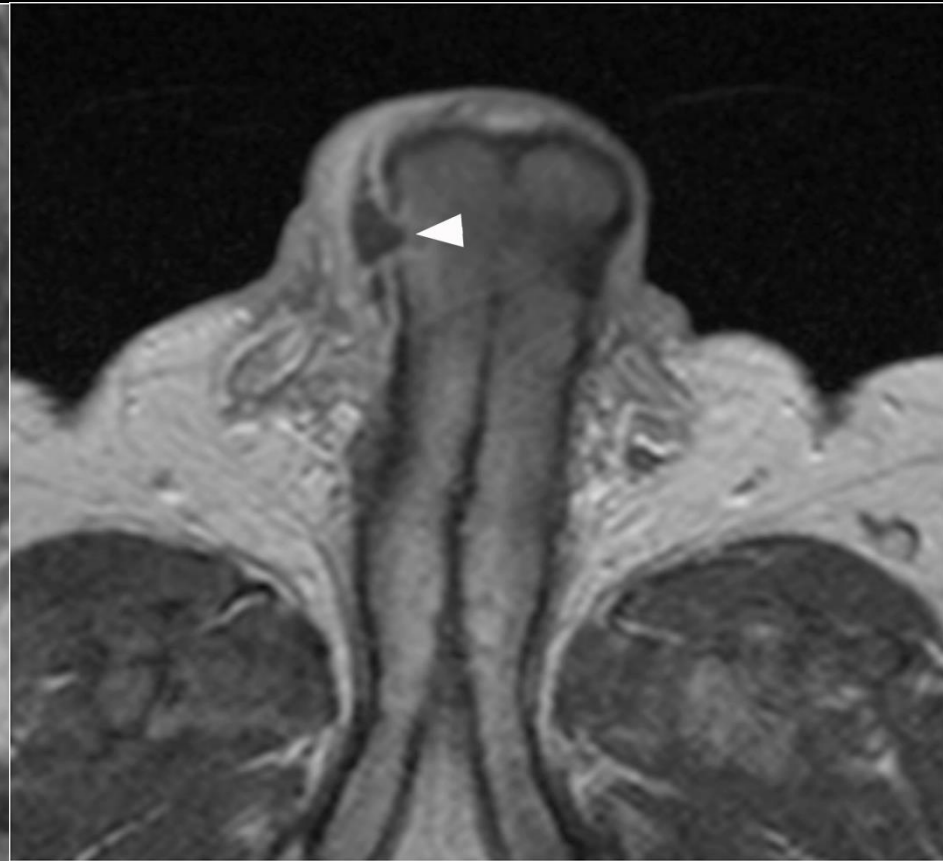
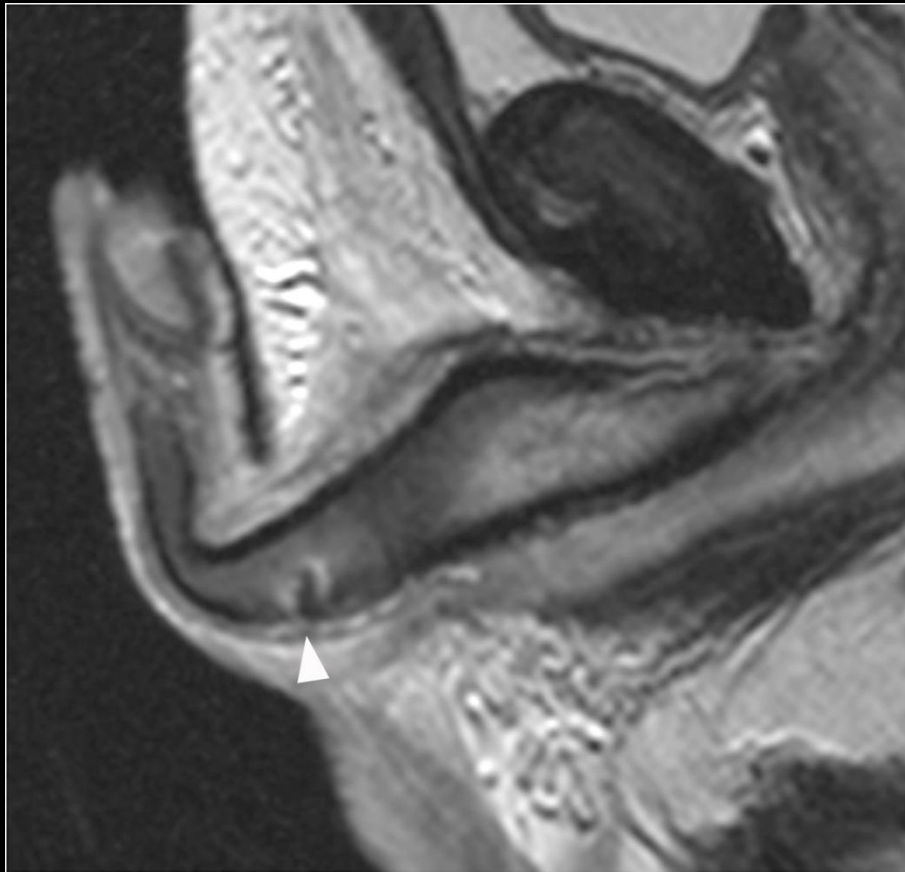


PENILE FRACTURE

Diagnosis

- Clinical
- ?USS/MRI
- Urethrogram/flexi cystoscopy

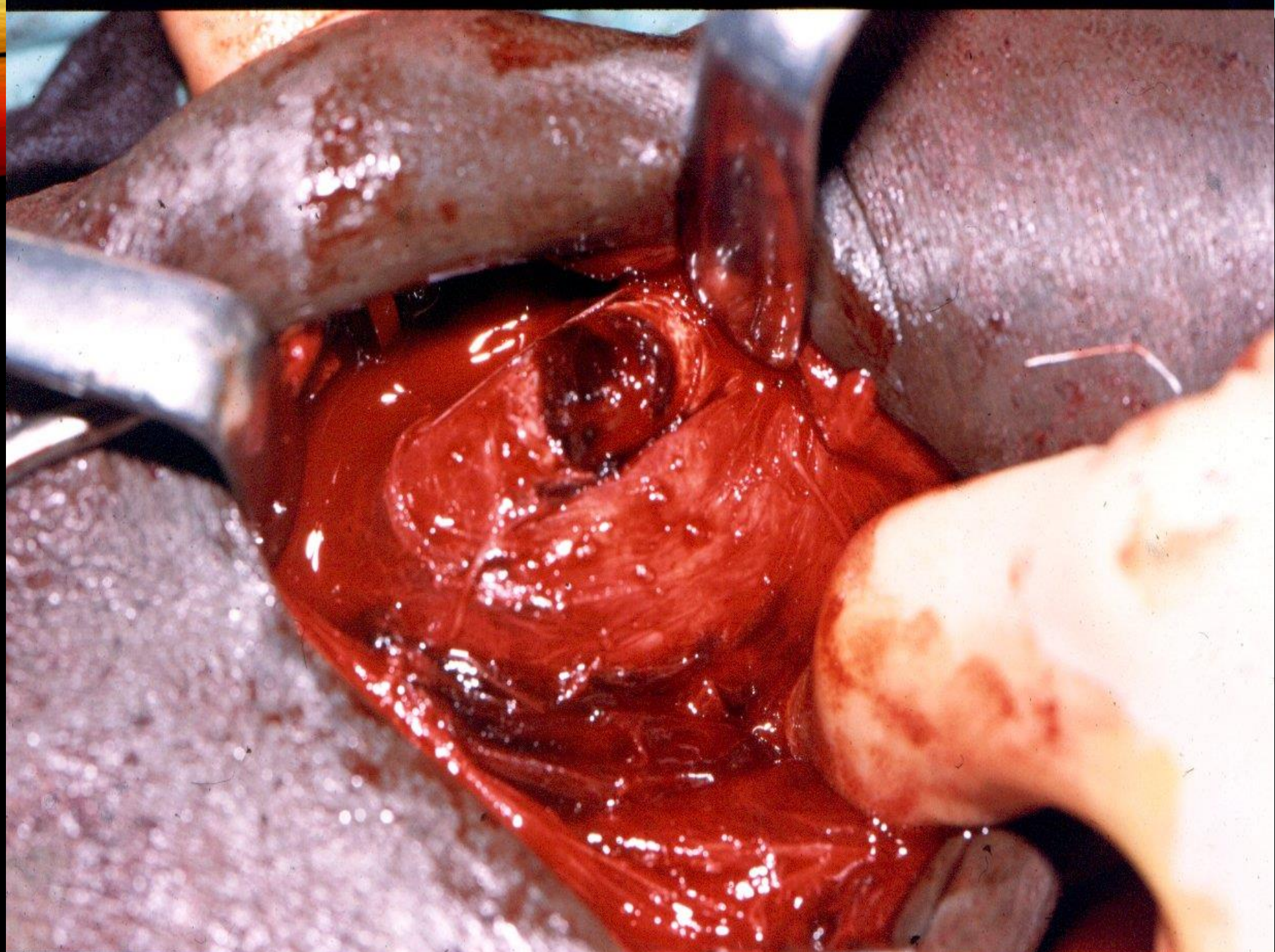
PENILE FRACTURE

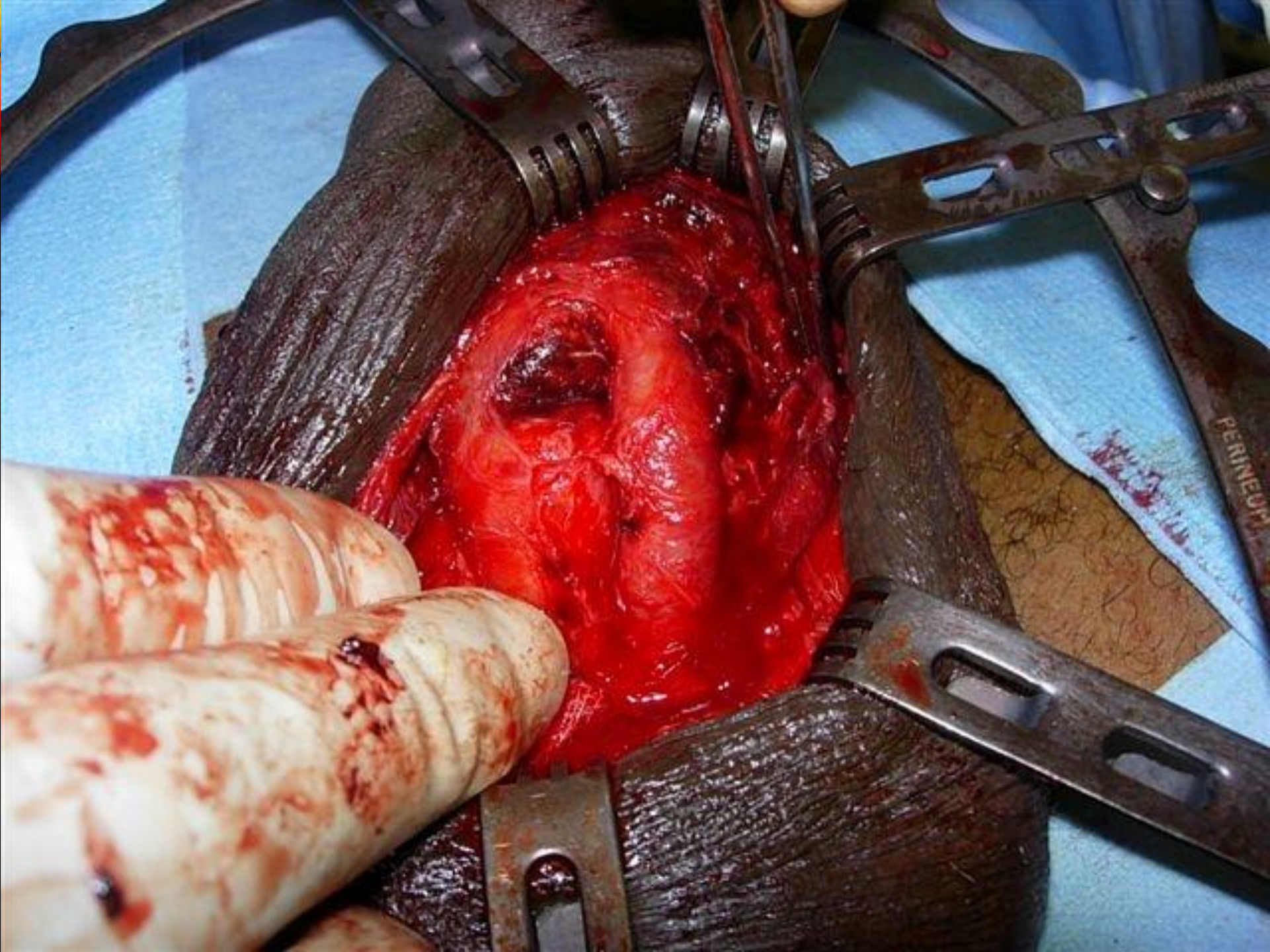


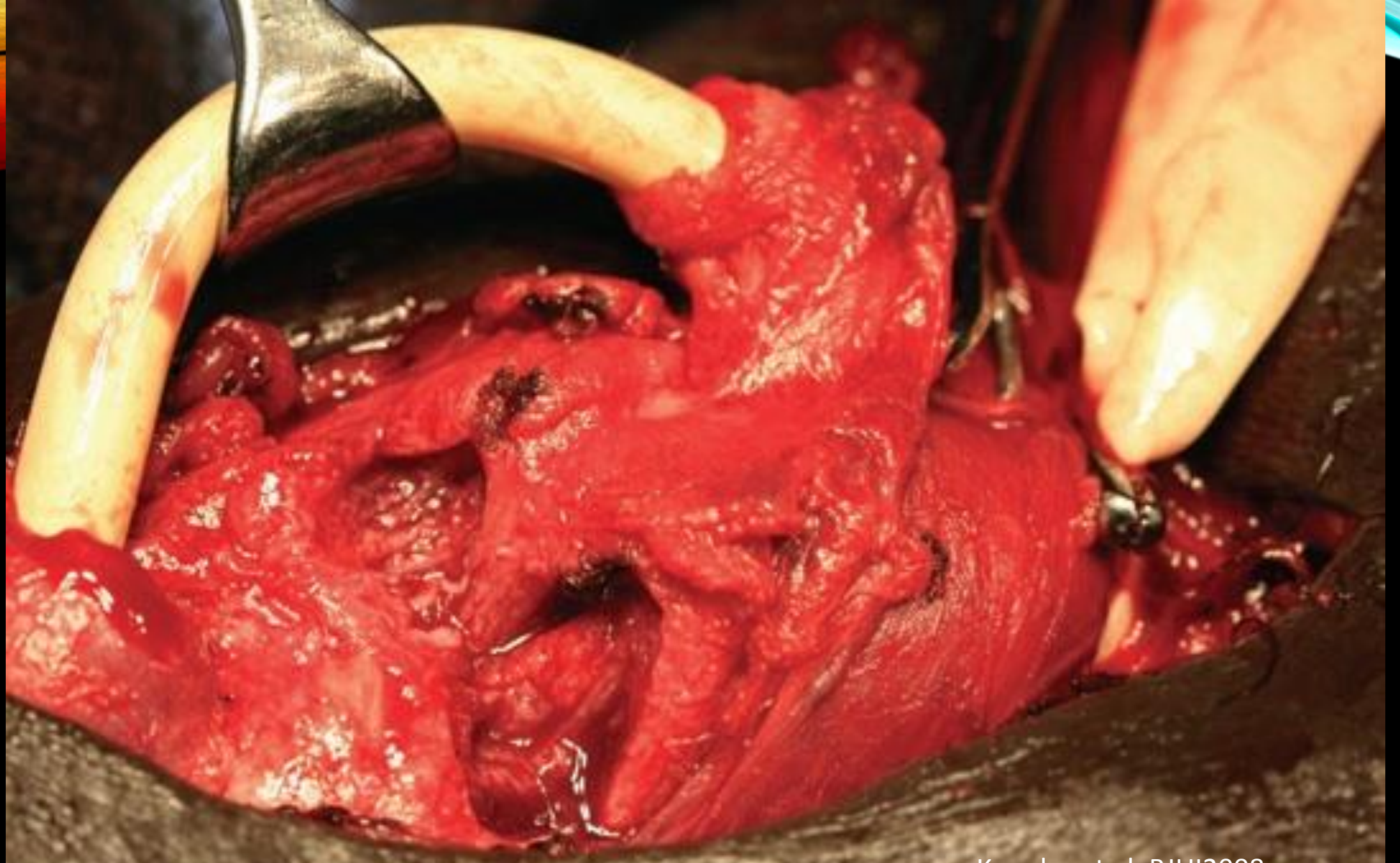
PENILE FRACTURE

Management

- Non operative- high complication rate
(ED, curvature, urethral stricture, pain on erection)
- Operative (within 36 hours)
 - A distal circumferential incision with degloving
 - ?Direct incision
 - Evacuation of haematoma
 - Minimal debridement
 - Closure of the defect- running or interrupted 2/0 or 3/0 polyglyconate or polydioxanone suture







RECOMMENDATIONS FOR PENILE FRACTURE GRADE C

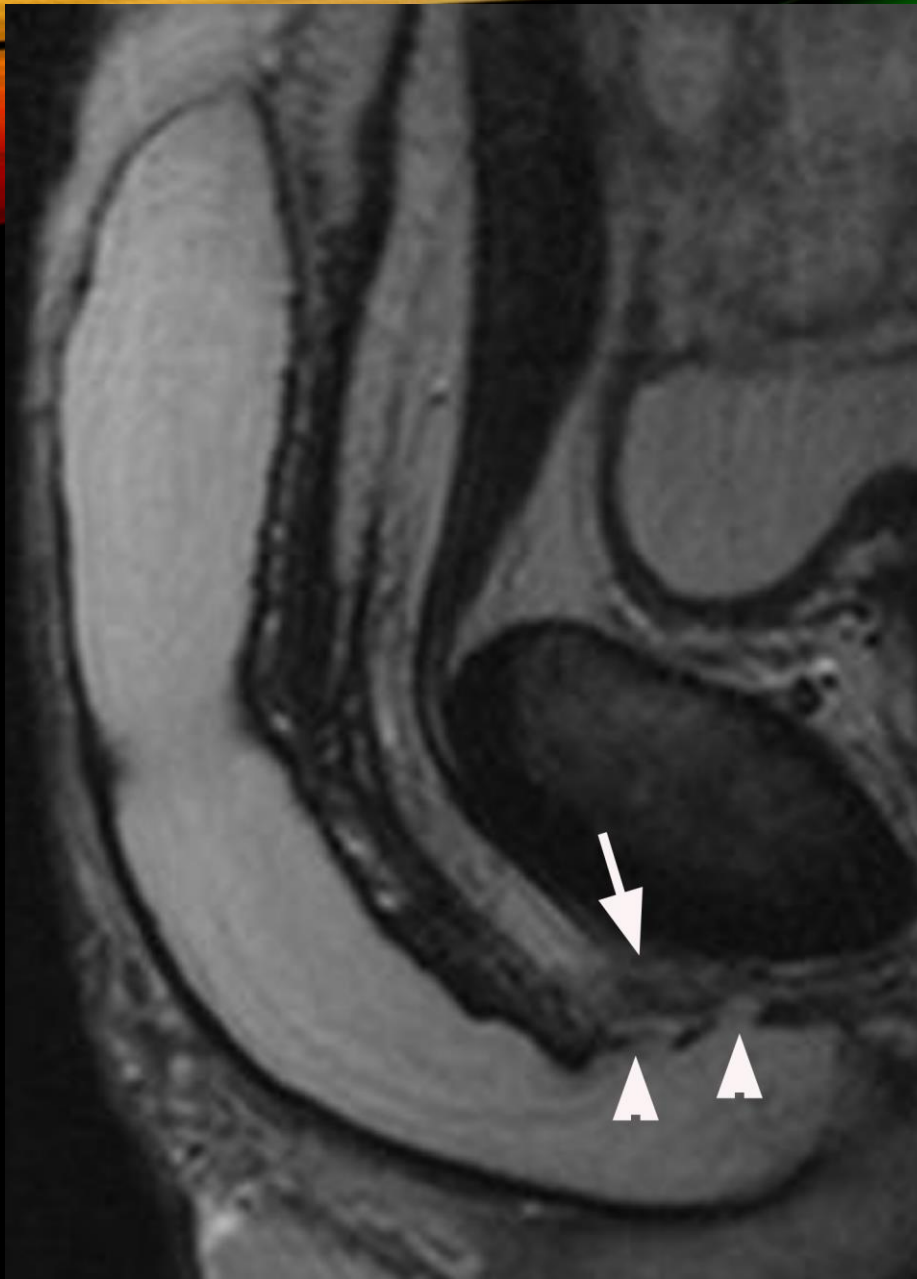
- Imaging (US or MRI) can be used for localisation of the injury
- Urethrogram (pre/peri op) can be performed if there is a suspicion of a urethral injury
- The ultimate decision for surgery is on clinical grounds
- Once diagnosed, there is no indication for conservative management

SUSPENSORY LIGAMENT INJURY TO PENIS

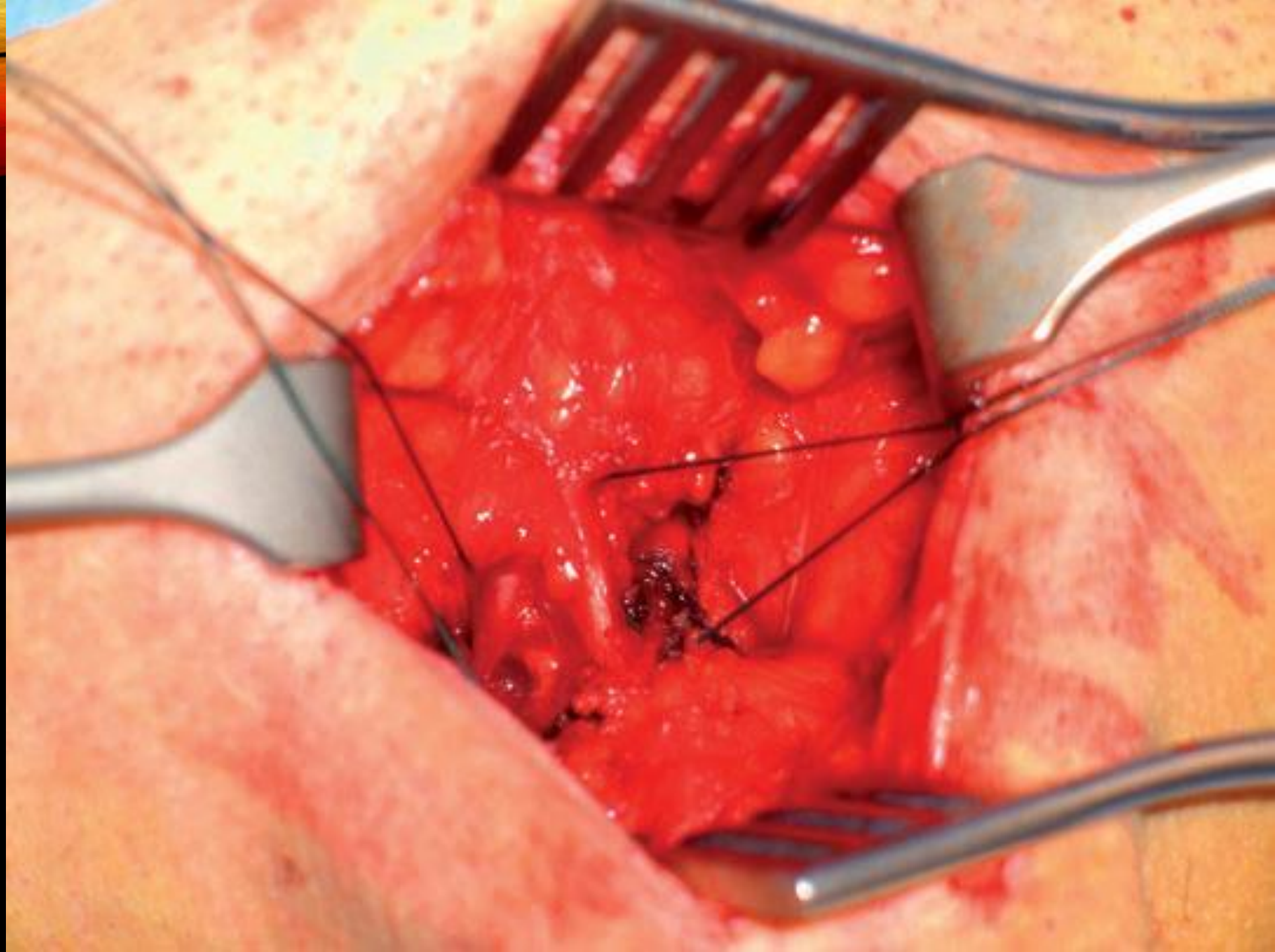
- Downward flexion leads to tearing
- Loss of penile stability
 - Minimal bruising
 - Palpable gap
- Repair with an infra-pubic approach

Palpable gap = deficient suspensory ligament









SCROTAL TRAUMA

TYPES OF INJURY

- ***Penetrating scrotal trauma***
 - penile skin loss
- ***Blunt scrotal trauma***
 - Testicular dislocation
 - Haematocoele
 - Testicular rupture



CAUSES

- Accidental
- Self Inflicted
- Bites

Penetrating scrotal trauma

- surgical exploration with conservative debridement of non-viable tissue (+/- skin graft in later stage)

primary reconstruction of testis and scrotum (+/- tunica vaginalis flap)

vaso-vasostomy

orchiectomy



Blunt scrotal trauma
Testicular dislocation

external inguinal ring, inguinal canal or
abdominal cavity.

manual replacement

orchidopexy

Haematocoele

Conservative management <3 times size of contralateral testis

large haematoceles

Early surgical intervention resulted in $> 90\%$ preservation of the testis

delayed surgery necessitates orchiectomy in 45-55%



Testicular rupture

50% of cases of direct blunt scrotal trauma

hemiscrotum

- tender
- swollen
- ecchymotic

USS Sensitivity for detecting tunical rupture 75%

CT

MRI

Surgical exploration and closure of the defect