Perineum Injury

WY Cheung
Case Presentation, Joint Clinical Meeting
AED QMH
Patient A  M/42

- Good past health
- S/F with blunt trauma from his heel to the perineum 1 week ago (23/8/2008)
  - Subsequently developed red, swollen and painful buttocks
  - No response to NSAIDs & antibiotics given by GP
Patient A  M/42

- Area of involvement continued to increase
- Rt. inner thigh egg-shaped swelling for 3 days
- ? Brownish-red discharge from perineum
- On presentation to AED, the redness and swelling had progressed to involve his scrotum
Patient A  M/42

- No hematuria, dysuria, or other urinary symptoms
- No problems with defecation
- No fever, chills, or rigor
Physical Examination

- GC good
- BP 95/62mmHg (RC 87/48mmHg), P 133/min, Temp 36°C, RR 16/min
- Hot, tender, erythematous swelling involved bilateral buttocks
  - extension to scrotum, bilateral upper thighs
  - penis spared
Physical Examination

- Testis not palpable due to scrotal tenderness & edema
- No discharge from penile meatus, no tenderness along penile shaft
- 4x3cm bulla with dark brownish content at Rt. inner thigh near the perineum
  - surrounded by a thin rim of gangrenous skin
Physical Examination

- Abdomen: soft & non-tender
- PR exam: no mass / swelling, no obvious tenderness
- Differential Diagnoses?
- Predisposing factors and causes of infection?
- Common causative organisms?
- Management?
- Choice of antibiotics?
- Surgery?
Differential Diagnoses

- Perineal and scrotal abscess
- Extensive perineal and scrotal cellulitis
- Fournier’s gangrene
- Strangulated hernia
- Vascular occlusion syndrome
Management

- **Problems:**
  - Tachycardia, hypotension
  - Extensive perineal infection

- **Management:**
  - Intravenous access and fluid resuscitation
  - IV antibiotics
  - Blood tests and imaging studies
  - Urgent consult surgeon and ICU
  - Surgical exploration and debridment
Management in AED

- O2 2L/min, transferred to resuscitation room with close monitoring of vital signs
- IV access x 2, Blood x CBP, R/LFT, RG, clotting, T & S, culture
- Initial resuscitation with 2.5L of fluids over 1 hour
  - Subsequent BP 92/55mmHg, P 100/min
Management in AED

- Started on IV penicillin G 2 megaunit & clindamicin 600mg
- Urgently consulted surgeon on-call and urologist
- Urgent CT abdomen and pelvis
- Transferred to ICU
## Investigation

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CT Abdomen and Pelvis
CT Abdomen and Pelvis

- Fluid collection affecting corpora cavernosa of penis and scrotum
- Fluid and air extended into bilateral ischioanal fossa with fat stranding (Rt. > Lt.)
CT Abdomen and Pelvis

- Scrotum is swollen with thickened skin and multiple internal air densities
- Air densities extending to Rt. lower anterior chest wall
Operations on D0

- Emergency excisional debridement and laparotomy performed jointly by urologist, plastic and colorectal surgeons
Operative Findings

- Gangrenous patch over perianal region at 7 o’clock with surrounding erythema spreading to bilateral upper thighs
- Scrotal erythema, edematous with subcutaneous pus
- Surgical emphysema over scrotal wall, anterior abdominal wall and up to chest wall (no erythema/gangrene)
Operative Findings

- Bilateral testes healthy, urethra not involved
- 2cm rectal perforation (at 7 o’clock, 5 cm from anal verge) causing right ischiorectal abscess & Fournier’s gangrene
Operative Procedure

- Scrotal, perianal and bilateral upper thigh skin, necrotic subcutaneous tissue debrided till healthy bleeding
- Ischio-rectal abscess drained
- Bilateral testes buried in subcutaneous thigh pouches
Operative Procedure

- Peritoneal lavage and diverting loop sigmoid colostomy done
- Abdominal skin incised for exploration
- Wound packing
Progress

- Septic shock controlled with double inotropes (dopamine and noradrenaline infusion)
- Acidemia, dehydration, renal impairment and anaemia corrected
- Extubated on D2
Progress

- Initially on IV empiric tazocin + levofloxacin
- Bacterial cultures revealed
  - Aerobes: E. coli, enterococcus, proteus
  - Anaerobes: Bacteroides
- Changed to IV augmentin (total: 44 days)
Progress

- Underwent multiple operations
- Stable under care of plastic surgeon (D96)
5 operations

- Excisional debridement of perinuem, scrotum and upper thighs + laparotomy + sigmoid colostomy (Do)
- Wound debridement and irrigation of bilateral lower trunk and groin (D1)
- Wound debridement and irrigation and EUA of anus/ ischiorectal abscess (D13)
- Wound debridement and closure with right pedicled anterolateral thigh flap (D35)
- Debridement of necrotic anterior perineum flap + split-thickness skin graft from right thigh (D49)
Fournier’s Gangrene

- Fulminant gangrene of the penis & scrotum
- Gangrenous erysipelas of the scrotum
- Necrotizing fasciitis of the perineum
- Periurethral phlegmon
- Phagedena
- Synergistic necrotizing cellulitis
- Fournier’s gangrene
Fournier’s Gangrene

- In 1764 Baurienne originally described an idiopathic, rapidly progressive soft tissue necrotising gangrene of the male genitalia
- First coined by Prof. Jean Alfred Fournier (French venereologist) in 1883
  - Idiopathic condition affecting the penis & scrotum which rapidly progressed to gangrene in young males

(Fournier AJ. Gangreene foudroyante de la verge. Semaine Medicine. 1883;3:345.)
Fournier’s Gangrene

- Contemporary Definition:
  “a synergistic, polymicrobial necrotizing fasciitis of the perineal, genital or perianal regions”
  - Not limited to young or male patients
  - Causative etiology is usually identified
Pathophysiology

- **Synergistic & polymicrobial** infection causing **obliterative endarteritis** of the subcutaneous arteries
- Resulting in gangrene of the subcutaneous tissue and overlying skin
Pathophysiology

- Organisms probably pass through the Buck’s fascia to spread along the planes of:
  - Dartos fascia of the scrotum and penis
  - Colles’ fascia of the perineum
  - Scarpa’s fascia of the abdominal wall

- Testicular involvement is rare, as testicular arteries originate directly from aorta
Epidemiology

- Frequency:
  - Relatively uncommon, true incidence unknown
  - Average of 97 cases per year (1989-1998)
- Male to female ratio = 10:1
- Age group: 30 – 60 years old
- Mortality: ~3 – 67%
Etiology

- More than 75% cases have identifiable cause
- Originate from an infection:
  - Anorectal:
    - Perianal, perirectal, and ischiorectal abscesses, anal fissures, diverticulitis, appendicitis, colonic perforation, colorectal malignancy
  - Urological:
    - Chronic UTI, infection of bulbourethral glands, epididymitis, orchitis, renal abscess, urethral stones, urethral stricture
  - Dermatological:
    - local cellulitis, furuncle, hidradenitis suppurativa, blunt perineal trauma
Etiology

- Other causes:
  - *Iatrogenic*:
    - Urethral instrumentation, prosthetic penile implants, genital piercing, complication of surgery (hemorrhoidectomy, herniorrhaphy)
  - *Women*:
    - Septic abortion, vulvar or Bartholin gland abscesses, episiotomy
  - *Children*:
    - Circumcision, strangulated inguinal hernia
  - *Less common causes*:
    - Bone marrow malignancy, SLE, Crohn’s disease, HIV
Predisposing factors

- Diabetes mellitus (up to 60%)
- Alcoholism (up to 50%)
- Cirrhosis
- Morbid obesity
- Any condition resulting in immunosuppression (HIV, malignancies, leukaemia, malnutrition, chronic systemic steroid use)
- Urological instrumentations
Causative Micro-organisms

- Polymicrobial: average of 4 isolates per case
- Organisms involved are commonly commensals
  - **Aerobic:**
    - E. coli, streptococcus, staphylococcus, enterococcus, proteus, pseudomonas, klebsiella, clostridium
  - **Anaerobic:**
    - Bacteroides
  - Fungi
Clinical Presentation

- Sudden or insidious
- Signs of inflammation of in the perineum and or genitalia (~70%)
  - PAIN OUT OF PROPORTION TO SIGNS
- Purulent discharge (~60%)
- Fever & tachycardia (~40-60%)
- Crepitus (~50%)
- Septic shock (~10%)
- Gangrene

HIGH INDEX OF SUSPICIOUS REQUIRED!

Investigations

- Diagnosis is primarily based on clinical findings
- Blood tests: to evaluate possible acid & base and electrolyte disturbances, dehydration, glucose intolerance, coagulopathy
- Imaging studies: should only be used to determine extent of affected areas
X-Rays
Treatment

- Aggressive resuscitation
- IV antibiotics
  - Penicillin: for streptococcus
  - Metronidazole: for anaerobic organisms
  - $3^{rd}$ generation cephalosporin: for coliform organisms and staphylococcus


- Tetanus prophylaxis
- **SURGICAL DEBRIDEMENT** is the mainstay of treatment
Surgery

- Repeated radical excisional debridement
- Fecal diversion (colostomy)
- Urinary diversion by urethral catheter
- Testis protection in subcutaneous pocket
- Reconstruction
Reconstruction

- 67% FG patients needed some type of reconstruction
  

- Techniques:
  - Primary closure of skin
  - Free skin grafts
  - Split-thickness skin grafts
  - Fasciocutaneous flap or musculocutaneous flap
Superomedial Thigh Flaps
Superomedial Thigh Flaps + Split-thickness Skin Grafts
Other Treatment Adjuncts

- *Hyperbaric oxygen*: using the same principle for treating ‘gas gangrene’ caused by C. perfringens
  - Increasing oxygen tensions → inhibiting & killing anaerobes

- *Unprocessed honey*: enzymatically debride, sterilize, and dehydrate wounds and to improve local tissue oxygenation and re-epithelialization
Advances in Wound Care

- Vacuum assisted closure (VAC) system dressing
  - Exposing a wound to subatmospheric pressure for an extended period
  - Increase in blood flow 4x with negative pressure values of 125 mmHg
  - Minimize skin defects, speed tissue healing
- Growth hormones, trophic agents applications
Post-operative Problems

- Pain with arousal
- Limited mobility of the genitalia due to scarring
- Impaired lymphatic drainage → edema and cellulitis
- Sexual dysfunction
- Emotional stress of a different body image
# Fournier’s Gangrene Severity Index

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<th>Low Abnormal Values</th>
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FGSI > 9 = 75% mortality rate  
FGSI ≤ 8 = 78% survival rate

# Patient A

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**FGSI = 10**
Fournier’s Gangrene Severity Index

- Over the years, most studies have validated the FGSI as a valuable prognostic factor although some have suggested different cutoff values.
- Useful in predicting survival but not length of hospital stay in a series of 19 patients.

Fournier’s Gangrene Severity Index

- In a retrospective study of 70 patients, FGSI was effective in predicting mortality (4.66 ± 2.31 in survivors VS 11.56 ± 2.68 in non-survivors)
- Predictive of length of hospitalization time and no. of debridements among survivors
- FGSI was lower in primary GU infection than primary anorectal infection

Other Prognostic Indicators?

- Colostomy
- Delay in presentation: >7 days
- Age >60
- Presence of systemic toxicity
- Extensive tissue involvement
- DM / Alcoholism
Conclusion

- Fournier’s gangrene is a rapidly progressive, fulminant infection
- Prompt diagnosis
- Immediate surgical, urological and ICU consultation
- Radiological studies may be helpful
- Aggressive resuscitation, broad-spectrum antibiotics coverage and radical debridement
- Reconstructive surgery makes return to normal social life possible
References