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Case Report

Necrotizing Fasciitis in a Young Healthy Adult Male Patient

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Abstract

Necrotizing fasciitis (NF) or as commonly known as flesh-eating disease, is a rare but potentially fatal infection involving the subcutaneous tissue and fascia. Early diagnosis sometimes difficult since necrotizing fasciitis at early onset cannot be differentiated from cellulitis. Delay in diagnosis and of course early surgical management leads to increased mortality and morbidity. Causative organisms are polymicrobial in two thirds of cases and one third caused by group A *Streptococcus* (GAS) and *Staphylococcus aureus*. Risk factors have been noted to include obesity, diabetes mellitus, immunosuppression, alcoholism, chronic renal failure among others. A predisposing factor can be trauma whether surgical or nonsurgical. In literature review, we couldn't come across any case of necrotizing fasciitis in a healthy adult patient without predisposing factors. Here we are presenting may be the first case of necrotizing fasciitis in a healthy adult male patient with no history of previous trauma.

We report a case of necrotizing fasciitis in a 44 years old male healthy patient at Jazan General Hospital; Jazan; Kingdom of Saudi Arabia.

Keywords: *Necrotizing Fasciitis; Perineal; Ischiorectal*

Introduction

Necrotizing fasciitis (NF) or as commonly known as flesh-eating disease, is a rare but potentially fatal infection involving the subcutaneous tissue and fascia.

Case Report

A 44yr old male who was seen by the surgical unit on 28th February 2022, with a history of generalized body pain, weakness and nausea for 7 days and left iliac fossa pain of 1 day duration. He had been seen twice in the ER department previously with suspicions of dengue fever without a surgical review requested. He had no altered bowel habits, he had no known comorbidities. No history of trauma. On examination he was febrile (38.7), dehydrated, with a pulse rate of 112 bpm, and blood pressure of 112/74 mmHg. He had tenderness in the left iliac fossa with a tender discoloured induration on the right ischiorectal fossa region. Leucocyte count was 19,000 with platelet of 56,000 and haemoglobin of 14.6. CT scan was done at PMBNH and reported emphysematous gangrene with extensive air located

within the perineum tracking along the ischiorectal region (stars) associated with diffuse fat stranding's and small fluid (Figure 1A and 1B), extensive air extended along the ischiorectal fossa (red arrows) associated with fat stranding's and small fluid in the pelvis (Figure 2), subcutaneous air within the perineum and right side of natal cleft (arrows) associated with mild fat stranding's (Figure 3A and 3B).

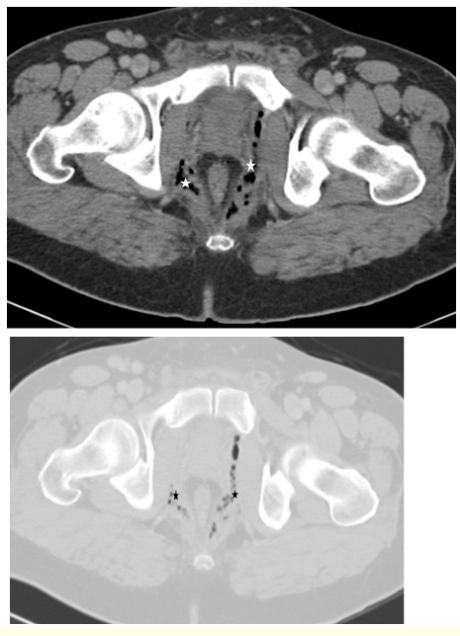

Figure 1A and 1B: *CT scan Axial soft tissue and lung windows demonstrates emphysematous gangrene with extensive air located within the perineum tracking along the ischiorectal region (stars) associated with diffuse fat stranding's and small fluid.*

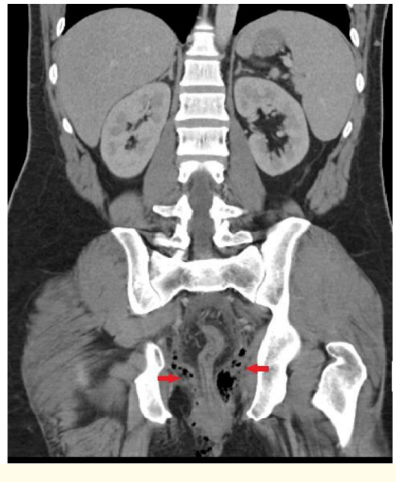

Figure 2: *CT scan coronal soft tissue window demonstrates extensive air extended along the ischiorectal fossa (red arrows) associated with fat stranding's and small fluid in the pelvis.*

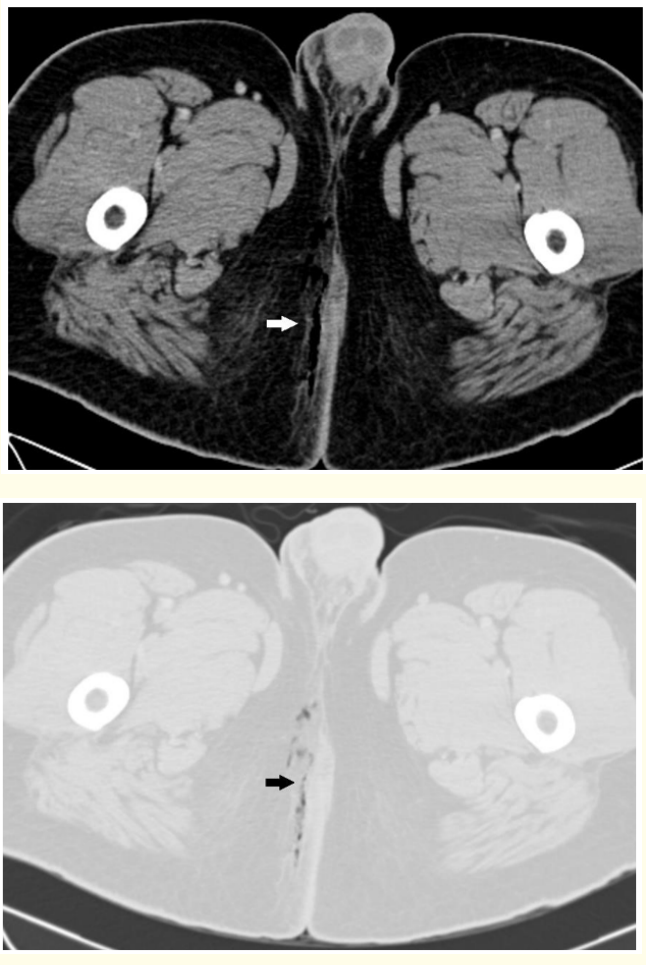

Figure 3A and 3B: *CT scan Axial soft tissue and lung windows demonstrates subcutaneous air within the perineum and right side of natal cleft(arrows) associated with mild fat stranding's.*

He had undergone four operations for debridement and drainage.

Initial surgery was a perineal debridement and drainage via the right ischiorectal fossa with findings of necrotic ischiorectal tissue and foul-smelling discharge. A wound culture specimen was taken, and patient was placed on broad spectrum antibiotics and twice daily wound dressings. No photos were taken for the first surgery.

Three days later, he still had persisting perineal wound discharge and was noticed to have a left hemiscrotal swelling with overlying skin discoloration. A repeat debridement was done in conjunction with the urology unit via a left scrotal incision which was extended through the left inguinal canal with findings of necrotic left scrotal tissue and abscess cavity communicating through the retropubic space. Urethra and both testes were intact (Figure 4 and 5). Necrosectomy and drainage was done through both the groin and preexistiing perineal incisions (Figure 6). Drains were inserted.

Figure 4: *The second debridement.*

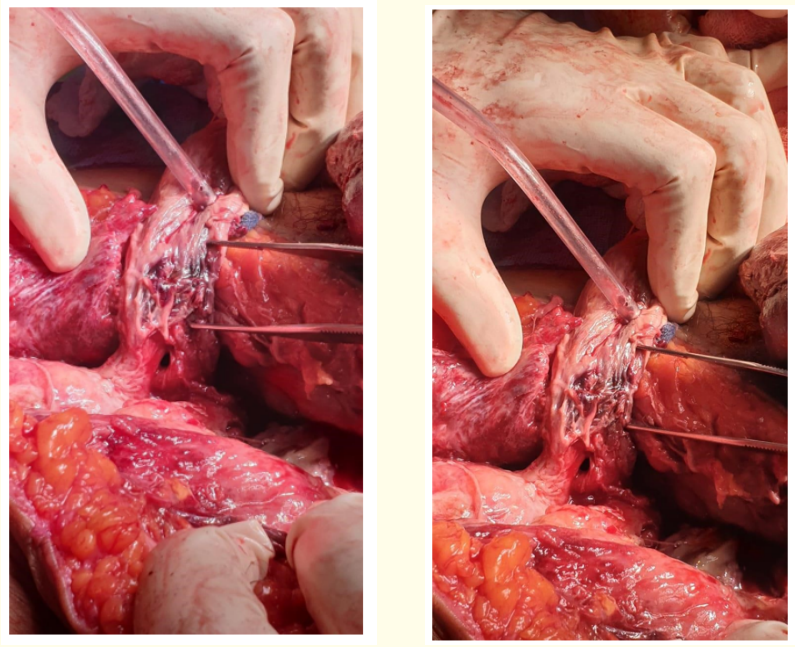

Figure 5A and 5B: *Left testis was intact.*

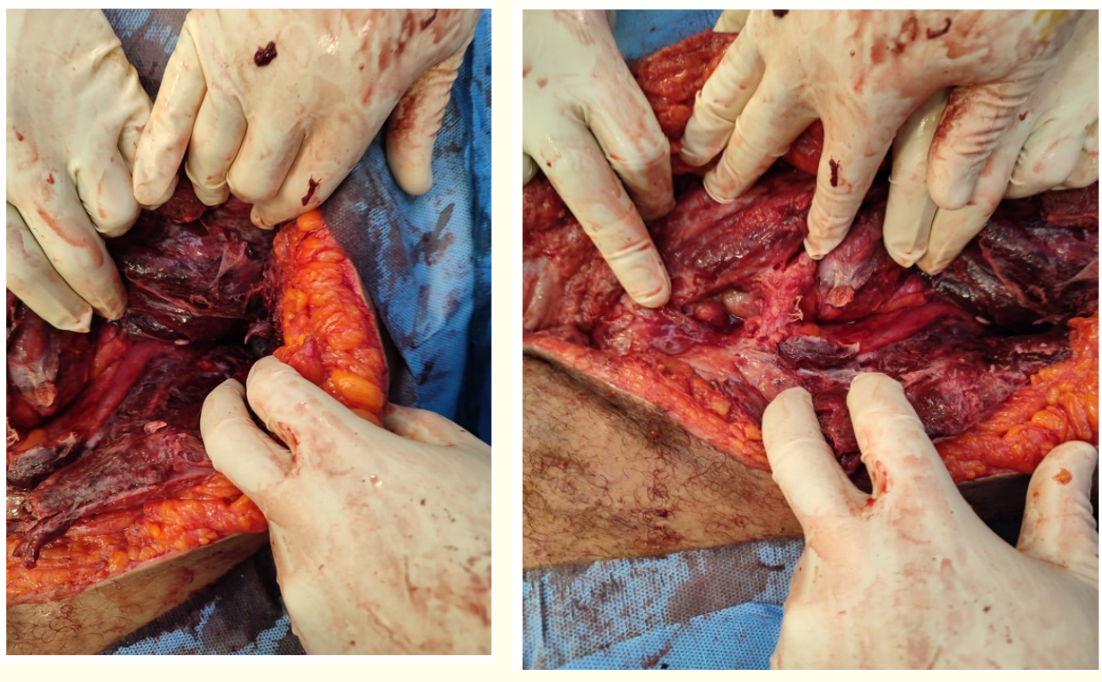

Figure 6A and 6B: *Necrosectomy and debridement for retroperitoneal extensive necrosis.*

Five days later, a repeat debridement was undertaken as it was observed that the left testis was nonviable, patient still had persisting pyrexia with purulent discharge (Figure 7). A left orchidectomy was done (Figure 8) and debridement extended extraperitoneally via the left inguinal incision to the left retroperitoneal (perinephric) space. Culture reported growth of *Escherichia coli* sensitive to meropenem and *Klebsiella pneumonia* resistant to all tested antibiotics. He was managed with meropenem, vancomycin and metronidazole and pain control was initially with pethidine and later paracetamol. A plan for nutritional rehabilitation was instituted. Wound dressings were done by the surgical team twice daily, he was encouraged to ambulate and Sitz baths were later commenced. Wound closure was done after 56 days on admission following which he was discharged home (Figure 9).

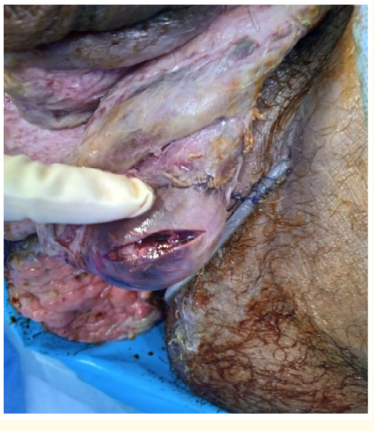

Figure 7: *Non-viable left testis with purulent discharge.*

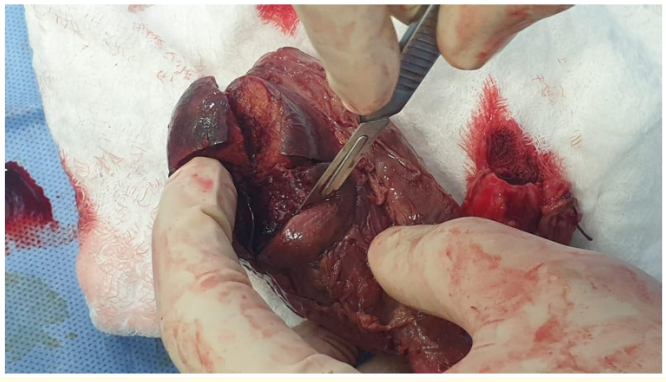

Figure 8: *A left orchidectomy for left necrotic testis.*

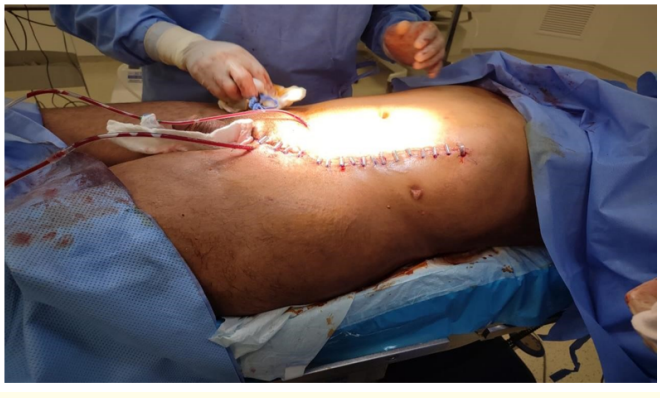

Figure 9: *Wound closure after 56 Days.*

Patient was followed in surgical clinic where surgical clips were removed and did well in the follow up for approximately one year.

Discussion

Necrotizing fasciitis (NF) is an uncommon surgical condition, mostly documented in literature as case reports or case series. Risk factors have been noted to include obesity, diabetes mellitus, immunosuppression, alcoholism, chronic renal failure among others. It has however also been reported with no identifiable risk factors but preceded by trauma whether surgical or non-surgical [1]. Presence of two or more comorbidities has also been noted to correlate poorly with outcome.

Various identifiable sources of infection in retroperitoneal necrotising fasciitis have been reported including chronic pyelonephritis, diverticulitis, peri-anal abscess, colonic cancer, perforation, urinary extravasation and post anal surgery [2-7].

Early diagnosis sometimes difficult since necrotizing fasciitis at early onset cannot be differentiated from cellulitis. Delay in diagnosis and of course early surgical management leads to increased mortality and morbidity.

The infection rapidly transits the muscle fascia. After several days the overlying skin, which appears unaffected initially, will transition to an erythematous, reddish-purple to bluish-grey hue. The texture of the skin will become indurated, swollen, shiny, and feel warm in temperature. At this stage, the skin is exquisitely tender to palpation and can also be painful out of proportion to presenting symptoms. Skin breakdown will begin in 3 to 5 days and is accompanied by bullae and cutaneous gangrene. Pain is reduced in the affected area secondary to thrombosed small vessels and destruction of the superficial nerves in the subcutaneous tissues. Advanced stages of the infection are characterized by systemic symptoms such as fever, tachycardia, and sepsis [8].

Tissue obtained from the operating room after debridement will usually show extensive superficial fascial necrosis.

Causative organisms vary widely according to infection site, underlying conditions, but also from one region of the world to the other. In two-thirds of the cases, the infection is polymicrobial (so-called type I infections), involving gram-positive cocci, *Enterobacteriaceae*, nonfermenting bacilli and anaerobic bacteria. Anaerobic, aerobic, and facultative anaerobic bacteria act synergistically and fuel a cycle of bacterial colonization and inflammatory tissue necrosis [9]. One third of NF are monomicrobial (type II infections), involving mainly group A *Streptococcus* (GAS) and *Staphylococcus aureus*.

A clinical diagnosis of retroperitoneal necrotizing fasciitis requires a high index of suspicion. Evaluation with CT scan may be helpful in these cases to diagnose, identify etiology and assess extent of the disease but should not unduly delay onset of therapy when suspected [2]. Findings at CT may include asymmetrical fascial thickening and enhancement, fat stranding, muscular edema, fluid collection, abscess formation and gas tracking [10]. The laboratory risk indicator for necrotizing infection (LRINEC) Score can be used to aid the diagnosis of NF.

The laboratory risk indicator for necrotizing infection (LRINEC) score [11].

	Score			
	0	**1**	**2**	**4**
C-reactive protein, mg/L	Less than 150			More than 150
Total white cell count (WBC), cells/mm	Less than 15	15 to 25	More than 25	
Hemoglobin, g/dl	More than 13.5	11-13.5	Less than 11	
Sodium, mmol/L	135 or greater		Less than 135	
Creatinine, mg/dL	1.6 or less		More than 1.6	
Glucose, mg/dL	180 or less	More than 180		

A score of six has a positive predictive value of 92% and a negative predictive value of 96%. A score of eight or greater represents a 75% risk of necrotizing infection [12]. Timely initial surgery after presentation to the hospital for NF decreases the mortality almost in half. This stresses the need for early surgical treatment of all NFs. The minimal "golden" time frame for operating patients is within 12 hours, while surgery within 6 h might be strongly preferred [13,14].

Early radical surgical debridement and dedicated repeat surgical explorations (average of 3.8) have been correlated with good surgical outcome [15]. Our patient required 4 surgical debridements including an orchiectomy with wound care following the surgeries being tedious as the patient required twice daily change of wound dressings which was tasking to the unit and inconveniencing to the patient. Negative pressure wound therapy (NPWT) would have aided in reducing frequency of dressings, controlling infection and speeding up wound healing [16].

Antibiotic therapy for NF patients includes a broad spectrum beta-lactam antibiotic (e.g. piperacillin-tazobactam) which is the mainstay of empirical therapy in addition to clindamycin in order to decrease toxin production mainly in proven or suspected group A *Strep-*

tococcus infections. The best duration of antibiotic treatment has not been well established and is generally comprised between 7 and 15 days [17].

Conclusion

Although necrotizing fasciitis (NF) is a rare condition, it is an aggressive challenging in diagnosis since it is difficult to be distinguished from cellulitis especially at early onset. Risk factors have been noted to include obesity, diabetes mellitus, immunosuppression, alcoholism, chronic renal failure among others. A predisposing factor can be trauma whether surgical or non-surgical. In literature review, we couldn't come across any case of necrotizing fasciitis in a healthy adult patient without predisposing factors such as trauma. Our case is the first case presented in literature as a case of necrotizing fasciitis in a healthy adult male patient without a predisposing factor such as trauma nor infections. Timely initial surgery after presentation to the hospital for NF decreases the mortality almost in half. In addition to timely surgery, antibiotic therapy is needed.

Antibiotic therapy for NF patients includes a broad spectrum beta-lactam antibiotic (e.g. piperacillin-tazobactam) which is the mainstay of empirical therapy in addition to clindamycin in order to decrease toxin production mainly in proven or suspected group A *Streptococcus* infections.

Consent

Written informed consent was obtained from the patient for both photographs and publication of this case.

Conflict of Interest

The author(s) reported no conflict of interest.

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