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Case Report

An intricate case of fulminant necrotising infection of perineum - from destruction to restoration: a case report

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ABSTRACT

Necrotising fasciitis (NF) is a well-known fulminant and disabling soft tissue infection. it can affect any age group, gender and healthy individuals. The toxicity and sepsis that it is capable of inciting is immense and caries high mortality across various authorities. Delay in presentation or identification may lead to increased morbidity manifold. This is one such case with large scale surgical destruction and requiring advanced means of restoration which makes it an interesting read for surgical fraternity.

Keywords: Necrotising soft tissue infection, Perineum, Graciloplasty, Diversion colostomy

INTRODUCTION

Necrotising fasciitis of the perineum are highly lethal infections that require early surgical management with extensive debridement of necrotic tissue.[1] Data from United States reveals that it carries a mortality of approximately 25%. And morbidity is high as well, with many patients suffering from physiologic derangements such as multisystem organ failure during their hospitalization.[2] Necrotizing fasciitis (NF) was first described by Jones et al, a confederate army surgeon, in 1871.[3]

Since then, this enigmatic topic has been studied and discussed for last 200 odd years, across the borders, nationalities and institutes all over the world. The disease like this is a curse on mankind, as the flesh-eating microorganisms can potentially affect anyone across the ages in both genders.[5-8] Though there are multiple risk factors which make one more susceptible to this sickness, however there is no impunity to the healthy ones. When there is involvement of the perineum and scrotum it is referred to as Fournier's gangrene. It was first described by the French dermatologist and venereologist Fournier et al.[4] Authors present one such case of Fournier's gangrene which warranted immense surgical debridement and later resulted in anal incontinence. The surgical team performed multiple surgical strategies in the management of this case including a neo anal sphincter reconstruction which makes it unique and interesting read.

CASE REPORT

67 years old male patient was a case of diabetes (poorly controlled), hypertension (HTN) and admitted with features of NF starting from his gluteal region for last 7 days. He had moribund general condition with uncontrolled blood sugars. His lab parameters Hb–8 gm% TLC–32000 cm^2. S. urea/creat–78/1.9 mg/dl, HBA1C-9%, S. alb–1.7 mg/dl.

He was taken up for an emergency debridement, initially as a sepsis control measure. His infection was getting extensive and spreading, despite surgical debridement and supportive care. What commenced with localization to left gluteal region, extended to left thigh, scrotum, peri anal region and right gluteal region and soon he landed up in septic shock requiring inotropic support. His wound

cultures grew polymicrobial organisms, and was being administered antibiotics based on sensitivity patterns. As a result of repeated debridement's, the wound was quite large in the perineum and peri-anal region (Figure 1a, b). The surgical team had to improvise their approach and made an end sigmoid colostomy in his left iliac fossa to divert the fecal material from his anal region to prevent frequent soiling.

In the inter operative period, he was subjected to the negative pressure wound therapy (NPWT) system to encourage the granulation and hasten the healing process. After 4 weeks of struggle, the surgical team could apply split skin graft over his raw wounds (Figure 1c, d).

It was for the nutritional, physiological and hemodynamic optimization, that his wounds healed and he could be discharged with the functional colostomy. It was soon realized that due to extensive surgical debridement's had left him incontinent and clinically the sphincter muscles were palpable neither in resting or squeeze.

A life saved from a deadly infection was appearing no less that a reward, but for the incontinence. However, with passage of time, patient suffered a poor quality of life and social outcast with his stoma bag and reverted back after a year with low morale but high hopes. The challenge was taken up by our team. His anal manometry studies were suboptimal. The family was counselled about the preparation, further procedures and possible outcomes. The daunting task of pre op rehab was begun with detailed advice on exercise of pelvic floor and hip, and sphincter exercises to tone up the residual musculature.

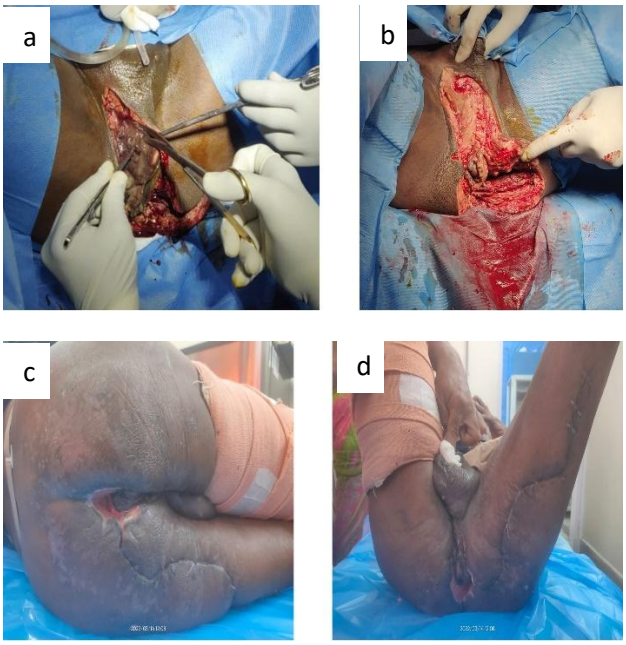

Figure 1: (a and b) Large surgical wound due to repeated debridements; (c and d) wound after SSG cover.

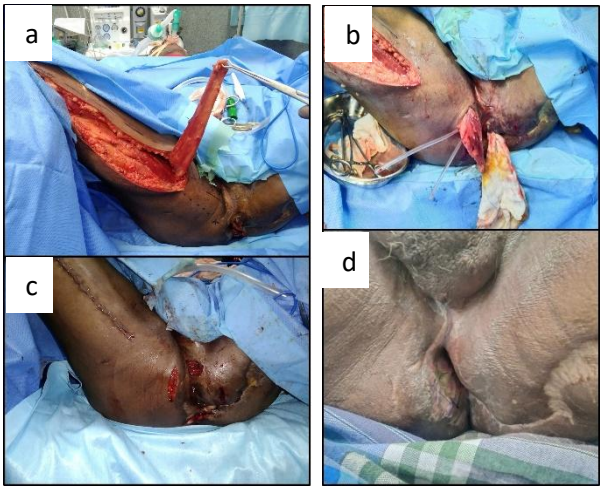

Figure 2 (a-d): Gracilis being dissected off right thigh. The muscle is drawn into the recipient site. The neo sphincter fashioned all around through multiple cuts around anal verge. After 4 weeks once the flap was set.

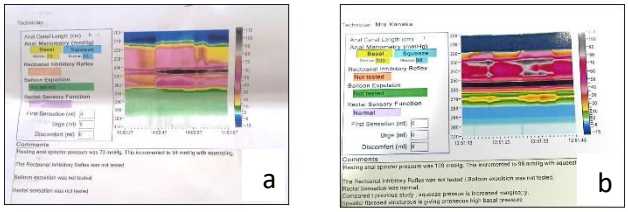

Figure 3 (a and b): Anal manometry studies done before surgery and post sphincteroplasty showing objective evidence of improved pressures.

After 6 months of preparations the manometry showed slight improvement and a phased-gracilis flap neoanal reconstruction was done. Surgical technique involved unilateral gracilis flap harvested distally from rt thigh and fashioned as a wraparound external anal canal and fixed (Figure 2a,b,c). Once the flap settled and was healthy, manometry confirmed as a normal study (Figure 3a,b). If that was not enough, he had developed a parastomal hernia in his end colostomy and after 4 weeks of graciloplasty, stoma was reversed and hernia repaired. His wounds healed well and required initial training to pass the stool by maneuvering his right leg. After 1 year of follow up he is stable and happy with his new normal continence and lives his life with pride.

DISCUSSION

NF is a rapidly progressive infection marked by swift tissue necrosis and a pronounced immune response to microbial invasion. The infection may originate from external trauma to the skin or spread internally from sources such as a perforated bowel. The systemic release of inflammatory cytokines-namely TNF-α, IL-1, and IL-6-can precipitate septic shock, leading to multisystem organ failure and potentially fatal outcomes.[9] Perineal NF

often presents subtly, mimicking benign conditions like cellulitis or localized abscesses, with symptoms such as pain, erythema, swelling, and warmth. This resemblance can delay diagnosis and intervention. To assist in early identification, the laboratory risk indicator for necrotizing fasciitis (LRINEC) score was introduced in 2004. Despite its initial promise, a recent prospective validation study revealed a modest positive predictive value of 25%, although its negative predictive value remained high at 92%. These findings suggest that LRINEC should not be relied upon as a standalone diagnostic tool, and its role in clinical practice remains contentious.[10] Ultimately, the responsibility for diagnosis and management lies with surgical and critical care teams.

Imaging plays a pivotal role in diagnosis. Plain radiographs may reveal gas within fascial planes. CT offers a sensitivity of 80–90%, with findings such as asymmetric fascial thickening, fluid accumulation, and soft tissue gas.[11] Magnetic resonance imaging (MRI) may show hyperintense signals in the fascia on T2-weighted sequences; however, its specificity is limited due to difficulty differentiating infectious from noninfectious inflammation. Microbiological analysis of pus and tissue samples from NSTIs has identified a wide array of pathogens, with polymicrobial infections (Type 1 NSTI) being the most prevalent. Empirical broad-spectrum antibiotics should be initiated promptly, followed by targeted therapy based on culture results.[13]

Several comorbid conditions-including diabetes mellitus, immunosuppression, chronic kidney disease, malignancy, prior radiation therapy, hypoalbuminemia, and malnutrition-are recognized risk factors that significantly elevate mortality rates in NF patients.[14] In cases of perineal NF, fecal diversion is recommended to prevent wound contamination.[12] This can be performed either immediately following initial debridement or during subsequent procedures. Colostomy is generally preferred over ileostomy due to its lower physiological burden. Recent innovations such as fecal diversion catheters have shown utility, though they are ineffective in managing fecal incontinence. Reconstructive efforts post-debridement aims to restore tissue coverage. Strategies range from conventional saline dressings to advanced modalities like negative pressure wound therapy (NPWT) and hyperbaric oxygen therapy. These approaches facilitate the development of healthy granulation tissue, which serves as a foundation for split-thickness skin grafting (SSG). In cases involving extensive tissue loss, myocutaneous flaps remain a reliable reconstructive option.

The surgical procedures for addressing anal continence are manifold. Anal incontinence post debridement can be addressed by muscle transposition techniques like gluteoplasty which was made popular in early 20th century.[15] The gracilis flap has been well described in the surgical literature for use in perineal reconstruction and has provided technically favorable outcomes. More than 30 years after Pickrell et al. originally described this technique in 1952, multiple authors have reported satisfactory results in achieving continence. Graciloplasty appears superior to gluteoplasty, as it is technically easier, has more neurovascular consistency and less donor site morbidity.[16,17]

Few limitations were realized during the course of management due to non-availability and logistic issues. The wound care was primarily based on saline dressings, and no chemical de- sloughing agents like silver stream, EUSOL, diperoxochloric acid (WOXHEAL) were utilized. Hyper baric Oxygen therapy has a proven role in augmenting wound healing was however not available in our vicinity.[18] In place of formal end colostomy, a flexi seal or stool managing appliance could have been attempted initially. However, it is a temporary measure and posed a difficulty in applying NPWT over the large wound that required to close off the anal opening. The choice of neo sphincter reconstruction surgery was based on surgical team's preference.[19]

CONCLUSION

The challenge to manage cases of NF lies with the multidisciplinary team. The reason for the progression of the infection lies in the delay of the first operative debridement, inadequate primary debridement, hemodynamic instability and comorbidities. Despite limitations and faced with a fulminant perineal infection the authors aim to inspire the surgical fraternity for sharing the burden of treating this curse on mankind.

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