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CASE REPORT

Necrotizing Fascitis- A Tale of Two Cases

Sarandeep Singh Puri , Suparna Dubey, Monal Trisal, Jyoti Mishra, Gurleen Gill , Shubhangi Gupta

Abstract

Necrotizing fasciitis (NF) is a rare dangerous life threatening disorder which is caused by a bacterial infection. This fulminant infection causes widespread necrosis of the skin, subcutaneous tissue, and superficial fascia and necrotizing soft tissue infection along fascial planes with or without overlying cellulitis. We report two cases of necrotising fascitis in young patients; one 8 months old female infant and the other 21 years old male. Both the cases were diagnosed on Histopathology.

Key Words

Necrotizing Fasciitis, Soft Tissue Infection

Introduction

Necrotizing fasciitis (NF) is a rare dangerous life threatening disorder which is caused by a bacterial infection. This fulminant infection causes widespread necrosis of the skin, subcutaneous tissue, and superficial fascia and necrotizing soft tissue infection spreading along fascial planes with or without overlying.[1] The diagnosis of necrotizing fasciitis is critical and timely diagnosis curbs rapidly spreading infection. The survival of the patient directly depends upon how fast the treatment has been started. There are several risk factors which influence the morbidity and mortality in patients who develop necrotizing soft tissue infections.

We report two cases of Necrotising Fascitis in young patients; one 8 months old female infant and the other 21 years old male. Both the cases were diagnosed on Histopathology.

Case No-1

A 8 month old female child presented with wound over the Left Leg Calf Region Lateral side with surrounding erythema since 2 days. The patient came to Surgery Department. The preoperative findings revealed necrotic tissue present over thigh and calf. (*Fig 1a,1b*) The Department of Pathology received Specimen of Excised Tissue from Thigh and Calf. The Gross examination of the specimen showed a single skin covered tissue piece measuring 5*3*2cm. An ulcerated area over the skin measuring 1 cm in diameter was noted.Microscopic sections of the case examined showed epidermis lined by keratinized stratified squamous epithelial lining with sub epidermal bullae formation. (Figure 2a) The dermis and underlining subcutaneous tissue showed mild chronic inflammatory infiltrate, edema with Gas Inclusions.(*Fig 2b*) Gram Staining showed presence of Gram Positive Cocci.(*Fig 2c*) And a final diagnosis of Necrotizing Fascitis was made on the basis of Histopathology.

Case No-2

A 21-year-old male presented with swelling over right thigh and fever since 4 days. The patient gave history of Local trauma. The provisional diagnosis of Cellulitis Right Leg was made clinically.(*Fig 3a,b*)

Subsequently Pathology department received specimen labelled as excised tissue from right thigh. The Gross examination revealed skin covered irregular tissue piece measuring 13*5*2 cm. Overlying skin appeared grey black.Microscopic examination showed subepidermal blisters, gas inclusions (*Fig 3c*) between muscle fibers with inflammatory infiltrate consisting of neutrophils, lymphocytes, histiocytes and plasma cells. Blood vessels

Department of Pathology, School of Medical Sciences and Research , Sharda University, Plot No. 32-34, Knowledge Park III, Greater Noida, Uttar Pradesh 201306.

Correspondence to: Dr. Monal Trisal, Assistant Professor, Department of Pathology, School of Medical Sciences and Research , Sharda University.

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Fig 1a,b. Clinical Picture of the 8 Months Old Baby with Extensive Necrotic Tissue Present Over Thigh and Calf.

Fig 3a,b- Clinical Images of 21 year old Male Showing Extensive Necrosis & Skin Defect Clinically Cistaken for changes of Cellulitis.

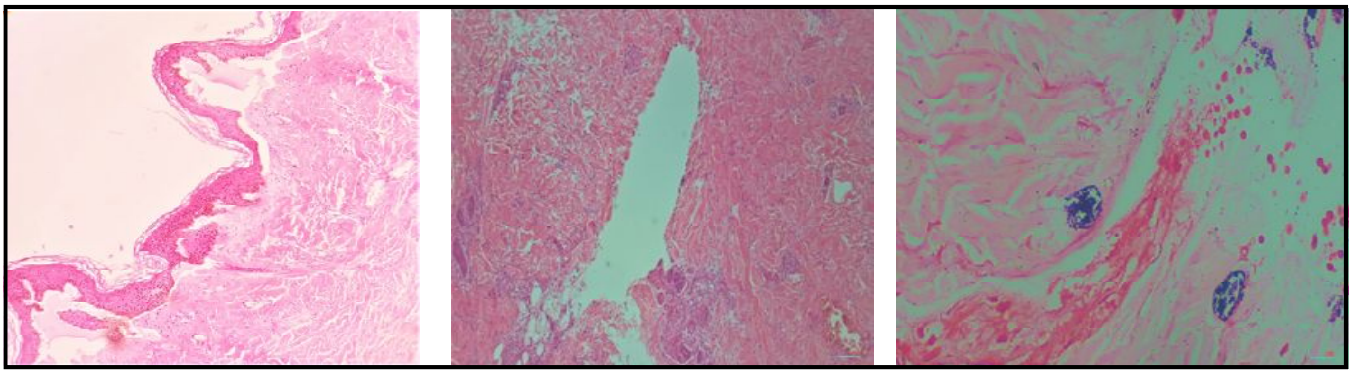

Fig2a- Photomicrograph Showing Epidermis Lined by Keratinized Stratified Squamous Epithelial lining with Sub Epidermal Bullae Formation. (H&E, 100x) Fig 2b-Photomicrograph Show Infected Tissue with Gas Inclusions Between the Muscle Fibers. (H&E, 400x) Fig 2c- Gram Staining Showed Presence of Gram Positive Cocci.(Gram stain,400x)

showed congestion and septic thrombi. Gram Stain was non contributory. A final diagnosis of Necrotizing Fascitis was made and clinical and microbiological correlation was advised.

Discussion

Necrotizing fasciitis (NF) is a rare dangerous life-threatening disorder which is caused by a bacterial infection. Early clinical suspicion of necrotizing fasciitis is crucial because patient survival is inversely related to the time interval between onset of infection and initiation of appropriate treatment. This fulminant infection causes widespread necrosis of the skin, subcutaneous tissue, and superficial fascia and necrotizing soft tissue infection spreading along fascial planes.[2]

The first English description for necrotizing soft-tissue infection was by British surgeon Leonard Gillespie and British physicians Gilbert Blaine and Thomas Trotter in the 18th century. At that time, necrotizing soft-tissue infection was known as Phagedaenic ulcer which means biting or chewing which gradually make a hole or destroying it.

It has had numerous appellations, including hospital gangrene, phagedena gangrenosum, progressive bacterial

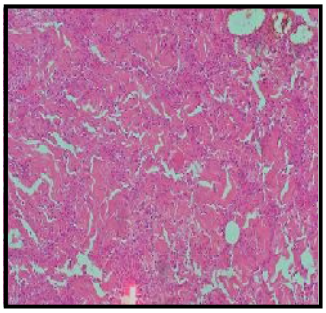

Fig 3c- Photomicrograph Shows Muscle Fibers with Gas Inclusions and Inflammatory Infiltrate. (H&E,400x)

synergistic gangrene, and Fournier's gangrene. The currently used term, NF, was first championed by Ben Wilson in 1952 as the most descriptive of this infectious process.[3] Necrotizing fasciitis can occur anywhere in the body. But it is most commonly seen in lower limb, upper limb, abdominal wall and genitals. Inoculation of organisms into the disrupted mucosa, skin by trauma, burns, or other modes of injury result in development of local infection followed by necrotizing fasciitis.[4]

Immunocompromised, advanced age, peripheral vascular disease, and obesity are some predisposing factors. The

survival of the patient directly depends upon predisposing factors and how fast the treatment has been started. NF must be distinguished from cellulitis, which lacks necrosis, and an abscess, which is a localized purulence as compared to the diffuse necrosis seen in NF.[5]

As per study by Ajitha *et al* [6] majority ie 48.3% of the patients in the study were in the age group 41-60 years and mortality rate was more among age group >60 years ie 26.4% with significant p value of 0.00013. The number of cases, severity and complications were significantly higher with the advancing age.Trauma (39.1%) was the most common etiological factor followed by spontaneous blebs (28.3%) occurrence seen especially in case of Fournier's gangrene with p value 0.0001. It signifies the association of NF with low socio economic status and who are more prone to trauma. NF can be divided into two distinct groups based upon the causative organisms. Type I is a polymicrobial infection caused by non-Group-A Streptococci (including Groups B, C, and G), aerobic organisms (including Enterobacter, E. coli, Klebsiella, and Pseudomonas), and anaerobic organisms (including Bacteroides and Clostridium). This type is most often found in patients who are immunocompromised.Type II infections are usually caused by Streptococcus pyogenes alone or with Staphylococci.

Monomicrobial infections are less common than the polymicrobial variety. These typically occur in the limbs and afflict healthy patients with no implicative comorbidities. There is often a history of trauma, frequently trivial. Community-acquired methicillin-resistant S aureus (MRSA) has increasingly been described in NF. A recent retrospective review by of cases Miller et al from 2000 to 2006 in Los Angeles, California, showed MRSA isolated in one-third of cases. Ajitha *et al* [6] showed most common organism isolated being Staphylococcus aureus being 64.1% followed by Pseudomonas and E coli. According to study done by O'Loughlin *et al* [7] the most common organisms isolated included Streptococcus 65.1 %, and Staphylococcus 34.2%. Clinical scores like the laboratory risk indicator for NF (LRINEC) are available to help diagnose NF and differentiate it from other skin and soft tissue infections.[8] The extent of microbial involvement in these tissues may range from simple contamination

and self limited bacterial contamination to an unpredictable clinical course and finally to septicaemia, multiple organ failure and death.[9]

Broad spectrum antibiotics, aggressive surgical debridement and intensive care unit support are essential. [10] To summarise, the existing literature has shown that there is a spectrum of signs and symptoms which needs to be taken into account while suspecting a case of Necrotising Fascitis. Laboratory evidences alone are not sufficient to make a diagnosis. It is a clinical pathological diagnosis. It has been proved in the recent studies that there are specific path gnomic clinical signs which are imperative to be found in the patients. Thus clinicians and pathologists have to collaborate while rendering the diagnosis of Necrotising Fascitis. Timely diagnosis and management of the patient can reduce the mortality rate.

Conclusion

To conclude, necrotizing fasciitis is a lethal disease which is a worrisome cause of mortality. A large number of multi centric studies will help in creating a database which will further facilitate in streamlining the assessment and management protocol of this disease. Knowledge about clinical presentation as in our case will prompt a better patient care. The population at risk is the one which comes under the aging strata and any kind of delay in the timely surgical intervention can be devastating. Clinicians must practice increased vigilance when treating patients with erythema, pain, and fever in order not to miss this rare but life-threatening condition

References

1. Hasham S, Matteucci P, Stanley PRW, Hart NB. Necrotising fasciitis. BMJ 2005; 330(7495):830-3.
2. Loudon I. Necrotising fasciitis, hospital gangrene, and phagedena. The Lancet 1994; 344(8934):1416-9.
3. Headley AJ. Necrotizing Soft Tissue Infections: A Primary Care Review 2003; 68(2):6.
4. Sadasivan J, Maroju NK, Balasubramaniam A. Necrotizing Fasciitis. Indian J Plast Surg off Publ Assoc Plast Surg India 2013; 46(3):472-8.
5. Bullard Dunn, Kelli M., and David A. Rothenberger. "Colon, Rectum, and Anus. Schwartz's Principles of Surgery, 10e Eds. F. Charles Brunicardi, et al. McGraw Hill, 2015. https://accessmedicine.mhmedical.com/content.aspx?bookid=980&sectionid=59610871.
6. Ajitha MB, Archana CS, Avinash K. A study on necrotizing fasciitis with theetiological factors and microbiological aspects with its prevalence. Inte J Surgery Science 2020; 4(2): 167-71.
7. O'Loughlin RE, Roberson A, Cieslak PR, Lynfield R, Gershman K, Craig A, et al. The Epidemiology of Invasive Group A Streptococcal Infection and Potential Vaccine Implications: United States, 2000-2004. Clin Infect Dis 2007; 45(7):853-62.
8. Wong CH, Khin LW, Heng KS, Tan KC, Low CO. The LRINEC (laboratory risk indicator for necrotizing fasciitis) score: a tool for distinguishing necrotizing fasciitis from other soft tissue infections. Crit Care Med 2004;32(7):1535-41
9. Tsai Y-H, Hsu RW-W, Huang T-J, Hsu W-H, Huang K-C, Li Y-Y, et al. Necrotizing Soft-Tissue Infections and Sepsis Caused by Vibrio vulnificus Compared with Those Caused by Aeromonas Species. JBJS 2007; 89(3):631.
10. Tang S, Kwok TK, Ho PL, Tang WM, Chan TM, Lai KN. Necrotizing fasciitis in a renal transplant recipient treated with FK 506: the first reported case. Clin Nephrol 2001; 56(6):481-5.