FATAL NECROTIZING FASCLITIS: A CASE REPORT

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Abstract

Necrotizing fasciitis is a severe life threatening soft tissue infection. The reported mortality varied from 20% to 76%. We describe the autopsy findings and the medico legal aspects of fatal necrotizing fasciitis with myositis in a 40 year old male. If neglected, the necrotizing fasciitis may lead to septic shock and death may occur due to multi organ failure. Such cases may be brought to Emergency Department as a case of sudden death or brought dead and frequently incur medico legal investigation. In some instances, the relatives may allege negligence on the part of doctor or deficiency in the services and may initiate civil or criminal action against the treating doctor.

Key words: necrotizing fasciitis, death, negligence, soft tissue infection, myositis

Introduction

Necrotizing fasciitis (NF) is a severe life - threatening soft tissue infection characterized by rapidly spreading inflammation and necrosis of the skin, subcutaneous tissue, and fascia. The reported mortality varied from 20% to 76% [1,2]. Necrotizing fasciitis usually affects the abdominal wall, perineum, & extremities and rarely affects head and neck region[3]. If the condition is neglected, NF may lead to septic shock and may lead to death due to multi organ failure. Such case may present itself to Emergency Department as a case of sudden death or brought dead and frequently require medico legal investigation. Similarly such cases may also be referred to forensic pathologist as an alleged case of negligence due to improper diagnosis or improper treatment by the clinician resulting is fatal outcome. In this case we discribe the autopsy findings of fatal NF and discuss the medico legal aspects of this condition.

Case report

A 40 year old male presented to the emergency department with pain, progressive swelling and bullous skin lesions on the right thigh. He had noticed pain and swelling in right groin two days ago, but neglected and did not bothered to take any treatment. The patient was a riksha-puller with no previous history of any major illness. He did not recall having sustained any injury on that part. He was smoker, tobacco chewer and alcoholic since 15 years.

On physical examination, the patient was febrile, toxic and lethargic. His blood pressure was 80/60 mmHg and pulse was 120/ min. Local examination revealed erythema and bullous skin lesions over upper part of right thigh. His condition deteriorated and he died while undergoing treatment within thirty minutes of starting the treatment. The body was referred to Forensic Medicine department for medico legal autopsy.

On external examination the deceased was moderately built and nourished, body weighed 55 Kg and length was 160 cm. The right lower abdomen, thigh and scrotum showed skin discoloration with multiple purple to blackish colored bullae, some of them ruptured showing denuded skin with signs of inflammation (fig 1). The tissue planes were easily dissected with blunt dissection. There was necrosis of the underlying skin, subcutaneous tissue, fascia and muscle. Microscopic examination revealed necrosis, edema and inflammatory infiltrate in subcutaneous tissue with inflammatory infiltrate and thrombosis in the blood vessels with epidermal detachment and dermal inflammation. There was myositis with focal myonecrosis (fig 2). On internal examination, lungs showed patchy consolidation and myocardium was

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flabby. Abdominal cavity contained 200 ml reddish colored fluid with focal gastrointestinal hemorrhage. Liver showed fatty changes and other organs were congested.

Discussion

The skin and soft tissues can be affected by number of infections ranging from mild pyoderma to life-threatening necrotizing fasciitis. The first report of necrotizing fasciitis in the United States occurred in 1871 by Joseph Jones, a Confederate Army surgeon, who called it hospital gangrene. The term currently in use, necrotizing fasciitis, was first utilized by Wilson in 1952 [4]. NF usually follows minor trauma such as a burn, laceration, scratch, insect bite, or needle prick and is usually caused by -hemolytic streptococci or a polymicrobial infection of both anaerobic and aerobic flora or may occur as part of gas gangrene caused by *Clostridium perfringens* [2, 5]. Similarly NF may also manifest as a part of streptococcal toxic shock syndrome (TSS).

Traditionally, the term NF denotes necrosis of the fascia and subcutaneous tissue with relative sparing of the underlying muscle [4]. The present case showed myositis and myonecrosis along with NF. Myositis and myonecrosis is not uncommon and in about 50% of cases, the condition may occur concomitantly with NF[6]. Similarly if the original penetrating injury exposes the muscle or the facial envelope surrounding a muscle is entirely involved by the necrotizing process then also myositis and myonecrosis may be developed [2]. Initially the skin is intact, but secondary gangrene follows, possibly due to thromboses in underlying vessels [7]. The precise mechanism resulting in necrosis is not known. Some investigators believe it is caused by bacterial enzymes, including hyaluronidase and lipases, which degrade fascia and fat, respectively.

An immunocompromised state such as diabetes mellitus, HIV, alcohol or intravenous drug abuse, malignancy, chronic liver disease, and postsurgical situations are the greatest risk factor for NF [1,2].

At autopsy, NF has to be differentiated from variety of skin and soft-tissue infections. The common superficial infections do not extend beyond the skin (epidermis and dermis), and include erysipelas, impetigo, folliculitis, ecthyma, furunculosis, and carbunculosis. Cellulitis is a deeper skin infection than erysipelas characterized by erythema and swelling with intact blood supply. The viable tissue is associated with an acute inflammatory response with small vessel engorgement, stasis, endothelial leakage with interstitial edema, and polymorphonuclear leukocyte infiltration [8]. Myonecrosis refers to a condition resulting in rapid necrosis of muscle, with delayed involvement of overlying skin and soft tissues. NF is characterized by tissue edema, crepitus, ecchymosis, non hemorrhagic and hemorrhagic bullous skin changes, rapidly progressive erythema, dermal gangrene and necrosis of subcutaneous tissue. The histopathologic features of necrotizing fasciitis are necrosis of the superficial fascia with blood vessel thrombosis and suppuration. Other consistent features include, severe subcutaneous fat necrosis; severe inflammation of the dermis and subcutaneous fat; vasculitis, often with endarteritis and local hemorrhage [4,6].

Role of forensic microbiology is obvious for two purposes; firstly for identification of causative organism and secondly to give feedback to the clinician. The microbiological samples are collected soon after death, otherwise widespread contamination by organisms from dead body may occur [9]. It is established practice in countries with cold to temperate environment. But considering Indian setup, the practice is limited by environmental conditions, the postmortem interval and the rapidly progressing autolytic process with widespread bacterial contamination. Therefore, forensic microbiology examination remains restricted investigation in this part of world.

In clinical practice, it becomes difficult to diagnose this condition in early period resulting in improper treatment and fatal outcome. In such cases, the opinion furnished by forensic pathologist has tremendous bearing on the malpractice suits. In NF, progression to septic shock can occur within hours and death results due to multi organ failure [5]. The key for successful management of NF is early diagnosis combined with aggressive treatment. The distinction

between surgical and medical infections in superficial tissue depends on the recognition of dead tissue in surgical infections. The important aspect of the initial approach to a surgical infection is the recognition that operative intervention is required [8].The omission of surgical operation under such situations may worsen the prognosis. Similarly the help of diagnostic modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) should be taken to assist the diagnosis and management plan. Failure to utilize these diagnostic modalities may delay the diagnosis , appropriate treatment and may increase the chances of morbidity or mortality. The relatives may allege negligence on the part of doctor or deficiency in the services and may initiate civil or criminal action.

Fig 1) Showing necrotizing fasciitis of thigh, lower abdomen and scrotum

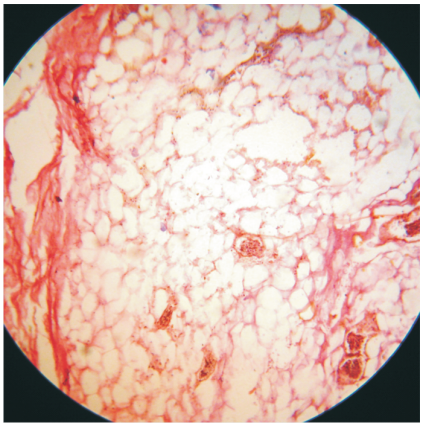

Fig 2) Microphotograph showing epidermal detachment, necrosis of collagenous and subcutaneous tissue with sparse collection of acute inflammatory cells with inflammatory infiltrate and thrombosis in blood vessels (H & E, X 40)

Therefore, the clinician should be more careful while managing such patients and should utilize appropriate investigation to arrive at diagnosis. The role of forensic pathologist is also equally important as they have to diagnose the condition unequivocally and furnish the cause of death.

References

1. Park S-Y, Park SY, Moon S-Y, Son JS, Lee MS. Fatal necrotizing fasciitis due to *Streptococcus pneumonia*: A case report. J Korean Med Sci 2011;26:131-4
2. Cho YS, Yang HT, Yim H, Park JM, Kim D, Hur J et al. Necrotizing fasciitis following a small burn. J Korean Surg Soc 2010;79:71-4
3. Bono G, Argo A, Zerbo S, Triolo V, Procaccianti P. Cervical necrotizing fasciitis and descending necrotizing mediastinitis in a patient affected by neglected peritonsillar abscess: A case of medical negligence. J Forensic Leg Med 2008;15:391-4
4. Green RJ, Dafoe DC, Raffin TA. Necrotizing fasciitis. Chest 1996;110:219-29
5. Frick S, Cerny A. Necrotizing fasciitis due to *Streptococcus pneumonia* after intramuscular injection of non-steroidal anti-inflammatory drugs: Report of 2 cases and review. Clin Infect Disc 2001;33:740-4
6. Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J (eds). In: Harrison's Principles of Internal Medicine. 17th ed 2008. McGrath Hill
7. Donaldson PMW, Naylor B, Lowe JW, Gouldesbrough DR. Rapidly fatal necrotizing fasciitis caused by *Streptococcus pyogenes*. J Clin Pathol 1993;46:617-20
8. Dellinger E P. Surgical infections and choice of antibiotics. In: Townsend CM Jr. (ed) Sabiston textbook of surgery, 11th ed 2001. W. B. Saunders Company. 176-8
9. Saukko P, Knight B. The forensic autopsy. In: Knight's Forensic Pathology, 3rd ed 2004. Arnold, London. 1 – 51