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## MANAGEMENT OF NECROTIZING FASCIITIS WITH DEBRIDEMENT : A CASE STUDY

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### ABSTRACT

Necrotising fasciitis (NF) is a severe, devastating soft tissue infection characterised by rapidly progressing tissue necrosis. The infection may start along the fascial plane and cause symptoms including erythematous, painful and oedematous skin lesions, which often rapidly deteriorate to haemorrhagic blisters, anaesthesia, and gangrenous necrosis over several days. We describe a clinical case with Necrotizing Fasciitis. A 48 years old man, who presented with NF on the Right gluteal region.

**KEYWORDS:** *Necrotizing Fasciitis, Debridement.*



## Introduction

Necrotizing fasciitis is a subset of aggressive skin and soft tissue infections, that cause necrosis of the muscle fascia and subcutaneous tissues. The infection typically travels along the fascial plane, which has a poor blood supply. Initially, the overlying tissues are unaffected, potentially delaying diagnosis and surgical intervention. The infectious process can rapidly spread, causing infection of the fascia and perifascial planes as well as secondary infection of the overlying and underlying skin, soft tissue, and muscle. This activity reviews the evaluation, treatment, and prognosis of necrotizing fasciitis and highlights the role of an interprofessional team in evaluating and improving care for patients with this condition.

The indication for debridement is the removal of devitalized tissue such as necrotic tissue, slough, bioburden, biofilm, and apoptotic cells. Debridement is recognized as a major component of wound management to prepare the wound bed for reepithelization. Devitalized tissue, in general, and necrotic tissue, in particular, serve as the source of nutrients for bacteria. Devitalized tissue also acts as a physical barrier for reepithelization, preventing applied topical compounds to make direct contact with the wound bed to provide their beneficial properties. Necrotic tissue also prevents angiogenesis, granulation tissue formation, epidermal resurfacing, and normal extracellular matrix (ECM) formation. Finally, the presence of necrotic tissue may prevent the clinician from making an accurate assessment of

the extent and severity of the wound, even masking possible underlying infections.

## NECROTISING FASCIITIS

Necrotizing skin infections were first described by Jones in 1871, although at the time the term *hospital gangrene* was used.<sup>1</sup> The term *necrotizing fasciitis* was coined by Wilson in the 1950s to describe necrosis of the fascia and subcutaneous tissue with relative sparing of the underlying muscle.<sup>2</sup> Necrotizing fasciitis is characterized by rapid destruction of tissue, systemic toxicity, and, if not treated aggressively, gross morbidity and mortality. Early diagnosis and aggressive surgical treatment reduce risk; however, it is often difficult to diagnose NF, and sometimes patients are treated for simple cellulitis until they rapidly deteriorate.<sup>3</sup> Antibiotic therapy is mandatory, and early surgical exploration and debridement is critical to ensuring a good outcome.

It is spreading inflammation of the skin, deep fascia and soft tissues with extensive destruction, toxemia commonly due to *Streptococcus pyogenes* infection, but often due to mixed infections like anaerobes, coliforms, Gram-negative organisms. It is common in old age, smoking, diabetics, immunosuppressed, malnourished, obesity, steroid therapy and HIV patients. Trauma is a common precipitating factor/ cause 80%. It can occur in limbs, lower abdomen, groin, perineum. There is acute inflammatory response, oedema, extensive necrosis and cutaneous microvasculature thrombosis. Muscle is

usually not involved in necrotizing fasciitis.<sup>4</sup>

Types:-

Type I-It is due to mixed infection:-

Microbiologically, NF has been classified as either type 1 (polymicrobial) or type 2 (monomicrobial).<sup>5</sup> Polymicrobial infections are more common, with cultures yielding a mixture of aerobic and anaerobic organisms.<sup>6</sup> These infections typically occur in the perineum and trunk. The isolates reflect normal skin commensalism found adjacent to the site of infection. In NF of the perineum, anaerobic bacteria are isolated. The etiologic isolates consist of Gram-positive organisms, such as *Staphylococcus aureus*, *S pyogenes*, and enterococci; Gram-negative aerobes, such as *Escherichia coli* and *Pseudomonas* species; and anaerobic organisms, such as *Bacteroides* or *Clostridium* species.<sup>7,8</sup>

Type II:-

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. As *S pyogenes* and *S aureus* are the usual pathogens.<sup>9</sup>

#### **PATHOLOGY:-**

Most cases commence with trauma to the skin surface (eg, from a penetrative injury

or even acupuncture needles, as was the case with our patient), with seeding of

bacteria. Infection starts in the deep tissue planes, and the epidermis might not be

initially affected. The clinical disease is expressed when infective organisms spread

through the tissue along the deep fascia. Bacteria rapidly multiply within viable tissue,

although fibrous attachments between subcutaneous tissues and fasciae limit spread

to areas like the hands, feet, and scalp. Lack of fibrous attachments in the trunk and

limbs, however, can lead to widespread infection and tissue destruction. Infection

also spreads to venous and lymphatic channels, leading to edema. The spread of

bacteria results in thrombosis of blood vessels in dermal papilla, resulting in

ischemia and gangrene of subcutaneous fat and dermis.<sup>10</sup> If the fascia is breached,

infection of the muscle leading to myositis occurs. Gas-producing organisms such

as *Clostridium* species can give rise to subcutaneous gas, from which stems the

descriptive term *gas gangrene*. In addition, infections with toxin-producing bacteria

(*S aureus* and *S pyogenes*) can lead to a toxic shock-like syndrome. Therefore,

seemingly limited infection can result in septic shock and multiorgan failure.

#### RISK FACTORS FOR NECROTIZING FASCITIS:-11

Diabetes

Chronic disease

Immunosuppressive drugs

Malnutrition

Age >60 years

Intravenous drugs misuse

Peripheral vascular disease

Renal failure

Underlying malignancy

Obesity

Clinical Features:-12

- Sudden swelling and pain in the part with oedema, discoloration, necrotic areas, ulceration. Foul smelled discharge.

- Features of toxemia with high-grade fever and chills, hypotension.
- Oliguria often with acute renal failure due to acute tubular necrosis.
- Jaundice.

- 80% are polymicrobial-streptococci, staphylococci, E. coli, Pseudomonas, Proteus, Clostridium
- Lower limb is the most common site-60% → Oedema beyond erythema, woody hard texture on palpation → Crepitus with subcutaneous emphysema, skin vesicles, dish water pus with grayish discharge are common

**Wound Debridement:** - Total excision of devitalised tissues until healthy, bleeding vascular, tidy wound is created. it is done at regular interval as staged procedures.

#### Case study

A 48years old male patient came to OPD with Necrotizing fasciitis on gluteal region of Right leg with history intramuscular injection diclofenac 75mg followed by hot water bag application. Patient came in OPD with necrotizing fasciitis, H/O burning sensation, redness, blister since 1.5month before followed by necrotizing fasciitis.

**Type of study-** Observational single case study without Control group.

**Study Centre** - Ayurved Rugnalaya & Sterling Multispeciality Hospital attached to College of Ayurved & Research center, Nigdi, Pune.

#### Study details

**Age-**48 yrs  
fish dealer

**Occupation-**

**Gender-** Male      **Religion-** Hindu

**Chief complaints-** necrotizing skin over right gluteal region, mild pain

**Brief history-**  
A patient was came for pyrexia with generalized weakness at general practitioner before 1-1/2 month at chinchwad, he was treated with injection diclofenac sodium 75mg intramuscular at

right gluteal region, then after 2-3 days at **Site-** C/O=redness, burning sensation, pain, blister formation, skin erosion followed by necrotizing fasciitis at gluteal region.

After that he was came to Ayurved rugnalaya and sterling multispeciality

hospital, nigdi, pradhikaran.

**On examination-** No other systemic disorder found.

**Family history-** Not Significant

**Local examinations:-** necrotizing fasciitis at right gluteal region.

**Site-** right gluteal region with post. aspect of right thigh.

**Size-** 30x15cm

**Tenderness-** mild tenderness

**Local Temp-** cold

**Skin above the wound -** necrosed

**Lab reports**

**Hb-** 11.6 gm/dl

**WBC-** 13600/cmm

**RBC-** 3.11 mil/cmm

**PLT-** 211000/cmm

**BT-** 2Min

**CT-** 7Min

**PT-** 15 sec

**INR-** 1.35 sec

**Sr Creat-** 1.2 mg/dl

**Urea-** 18

**BSL (R):** - 92mg/dl

**HBSAG:** - Negative

**HIV I, II:** - Negative

**HCV:** - Negative

## Material and Method

After Investigations patient shifted to OT, spinal anaesthesia given, scrubbing to right

gluteal region with post. Aspect of right thigh . Painting and draping done, debridement done till active bleeding and healthy tissue is seen. All necrotizing fascia with unhealthy tissue excised. NS wash given. After cleaning of debrided wound Pressure bandage applied and dressing done.

Patient received IV antibiotic Postoperatively anti-inflammatory and analgesics for 5 days. Then shifted on oral antibiotics.

Dressing opened on 3rd day, It is observed that soakage+++ ,severe pain with foul

smell++. Then cleaning with NS, remove slough with unhealthy tissue, gauze soaked in eusol kept on wound and dressing with pressure bandage.

## Management and Outcome -

Debridement of necrotizing fasciitis done, up to healthy vascular tissue is seen.

Cleaning and dressing done and pressure bandage applied on wound.

## Conclusion –

This case shows major necrotizing fasciitis can be treated with debridement, and

excision of unhealthy tissue with slough, it helps in granulation tissue formation and wound healing.





Before stage of necrotizing fasciitis





Necrotizing fasciitis







post operative debridement



Granulation tissue formation



Reepithelization



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