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A study of surgical outcome in necrotising Fasciitis of deep cervical fascia

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Abstract

Four Patients in 5th and 6th decade who are highly diabetic suffering from necrotising fasciitis (NF) has been described in this study. Most general symptoms were that they presented with h/o difficulty in breathing and difficulty in swallowing since 2-3 weeks.

Very limited studies are there in the field as these are considered to be very rare. This study is one such effort to study the surgical outcome.

Keywords: Necrotising fasciitis, deep cervical fascia

Abbreviations: NF - Necrotising fasciitis, GRBS – Glucose random blood sugar, CRP – C-reactive protein
TC - total count, LRINEC – Laboratory risk indicator for necrotising fasciitis score

Introduction

Necrotising fasciitis rare but life threatening and high mortality,
Rate incidence: 1-5/100000

It is invading deep fascia, so early recognition is crucial.

Early surgery like letting out the pus and immediate debridement helps to save the mortality and reduce morbidity too.

Here we would like to bring to the notice that it is on the rarest site i.e cervical region as compared to limbs and perineum, scrotum or GI tract. Another point to enlighten in this, is that patient had NF of unusual, atypical presentation as far as site of clinical signs are concerned.

It has been recognized for centuries with various names, but the current name 'necrotizing fasciitis' was first used by Wilson in 1952 [1, 2]. Necrotizing fasciitis commonly affects the abdominal wall, perineum and extremities [2]. This disease rarely involves the head and neck region; and if it occurs, it is usually due to the spread of infection from the teeth or pharynx [3]. The incidence of necrotizing fasciitis is 0.40 cases per 100,000 people [4]. Diabetes mellitus is known to be one of the comorbidities in the progression of the disease. Necrotizing fasciitis of the head and neck has a particularly high mortality rate due to the proximity of many vital anatomical structures. Known complications of cervical necrotizing fasciitis include airway compromise, arterial and venous occlusion and the extension of infection into the mediastinal and pleural spaces [5]. Dysphagia and odynophagia are also common symptoms [6].

The most frequent source of infection for necrotizing fasciitis involving the head and neck region are the teeth or pharynx. Periapical infection of the second or third molar is the usual culprit for cervicofacial infection. This is because the roots of these molars extend below the insertion of the mylohyoid muscle, which is connected to the submandibular space [7].

Aims and Objectives: To study the surgical outcome in Necrotising fasciitis of deep cervical fascia.

Materials and Methods: The study was done in the Department of Anatomy, Srinivas Institute of Medical Sciences, Mangalore.

Four patients who landed in the Department of Surgery were identified. After careful examination they were put on broad spectrum antibiotics preferential to streptococcus/staphylococci aureus, inspite of that he was not showing any improvement in signs and symptoms. The treatment that was given is the same for all four and in the results would be discussed. The outcomes will be reported.

Inclusion Criteria: All 4 patients

Exclusion Criteria: There was a fifth patient who was not included because he was chemotherapy.

Results



Fig 1: At different levels of management

Treatment - after 24 hours of antibiotic treatment. Patients were taken for pus drainage and debridement of deep fascia - collie's fascia and the fascia invading neurovascular bundle ie. carotid sheath, pre-tracheal fascia, invading fascia debridement was done - through longitudinal approach on the anterior border of right sternocleidomastoid along its whole length and at suprasternal notch level, crossing the midline and encroaching

on the left region underneath the left sternocleidomastoid and over the left infraclavicular region & retrosternally- debridement done till the aortic arch pulsation felt. Drain kept underneath both sides of sternocleidomastoid muscle.

Stage wise debridement done on 2 alternate days. On the 3rd day debridement with vacuum assisted drain was kept. On day 11, the drainage of pus was very minimal, vacuum assisted drain

was removed. Patients were afebrile during the time period. TC came down to 10000 cells/cum of blood.

Repeated pus culture - no growth seen

No staphylococci, streptococci, MRSA

Meropenem was given for first 5 days

Aminoglycoside for 5 days

Later on he was put on antibiotics and Augmentin orally for 14 days.

At the end of the treatment

Patient 1 Wound healed by secondary intension

Patient 2 Wound healed by secondary intension

Patient 3 Septicemia and multi organ failure

Patient 4 Septicemia and multi organ failure

Discussion

NF is an infectious disease. Incidence- 1/100000 population.

Spreading in deep fascial plane.

Common organism –

Type 1: Staphylococci, streptococci, enterococcal,

Enterobacteriaceae, bacteriodes.

Type 2: Group A streptococci

Type 3: Vibrio species, methicillin resistance, staphylococcus aureus/MRSA.

10% caused by group A streptococci - widely known as bacterium - even been termed 'flesh eating bacterium'

One aspect to consider are bacterial virulence factors such as M-protein by which the bacteria are believed to evade the immune system, another factor not well analysed in interbacterial communications in case type-1 NF and multiple species.

Risk factors

For Type 1 NF

Diabetes, immunosuppressive therapy, chronic infective disease, advanced age.

For type 2 NF - risk factors specifically described but even identified in young and healthy individuals.

Any kind of skin lesions ranging from insect bite, extensive injuries, abrasions serve as portal of entry for bacteria. Once it gains access into blood circulation the infection starts on muscle injury. Vimentin - cell surface associated protein - to which streptococci has ability to bind in the early stages of infection, the infection spreads in the deep fascia plane hence the overlying skin appears normal.

Only more advanced cases patients quickly develop blisters, bullae, skin necrosis, skin induration, fluctuation, haemorrhagic bullae, skin crepitation's.

Systemic signs - hypotension, respiratory distress

Diagnostic option

For early detection, immediate treatment and early complete cure is the aim after treatment which is however delayed because early symptoms are non specific hence difficult to diagnose or detect. There is no laboratory parameter specific for NF. So called laboratory risk indicator for necrotising fasciitis score has been proposed to categorise the average risk of NF. Even normal LRINEC score - also been shown when pt. had NF. In our case of cervical NF, LRINEC score at admission was 10.

Creatinine - 1.6 mg/dL

GRBS - 320 mg/dL which is highly indicative of NF

Stage wise debridement removes all necrotic materials. Here in our cases, 2 staged debridement of necrotising tissue with VAC system with proper coverage of antibiotic and sugar management lead into early complete cure.

Alternative treatment by intravenous immunoglobulin's in case of limb hyperbaric oxygen been explained.

Conclusion

1. Whenever patient present with very sick systemic infection like toxic shock, attention should be given to painful skin lesion.
2. Pt experiences severe pain but cannot be explained by the extent of injury because bacterial infection spreads along deep planes where signs are concealed.
3. Vital to keep in mind the NF when there is suspicion and act immediately since it is a dreaded disease with mortality and morbidity.
4. Even though LRINEC score is negative, still NF cannot be ruled out.
5. Treatment of NF with multidisciplinary approach.

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CRP - 120 mg/L.

Total white cell count- > 15

Hb - 12.1 gm/dL

Serum sodium - 132mmol/L