



Research Paper

Necrotizing fasciitis of the head and neck: Surgical follow up of 2 cases with the use of LRINEC score

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ABSTRACT

Necrotizing fasciitis of the head and neck is a rare, rapidly progressive infection involving the skin, subcutaneous tissue and fascia. We report two cases that presented at the otolaryngology department at our institute in 2016. Both patients presented with a history of diabetes and according to the LRINEC score they both showed a moderate risk of having the disease. LRINEC is a valuable tool in both diagnosing the case and can be used to follow up the case, as the first case showed a decrease in score during her stay in the hospital, the second case showed an increase in score. We advocate the importance of early detection, eradicating the source of infection followed by frequent, meticulous wound dressing and strict blood sugar control to obtain better outcomes in managing necrotizing fasciitis of the head and neck.

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1. Introduction

Necrotizing fasciitis is a rare, life threatening single or polymicrobial infection to the deep layers of the skin and subcutaneous tissues which easily spreads across the fascial plane. The disease has a potentially fatal outcome and usually occurs within all ages most commonly around 40 years of age. It has been recognized for centuries with various names, but the current name 'necrotizing fasciitis' was first used by Wilson in 1952 [1].

According to a retrospective review of patients treated for NF in 3 tertiary hospitals in Canada, head and neck manifestations were (5%) and common sites of infection included the lower extremities (28%), upper extremities (27%), perineum (21%), trunk (18%) [2]. This disease rarely involves the head and neck region, and when it does it is usually spread from infection of the teeth or pharynx [3].

The incidence of NF in adults has been reported to be 0.40 cases per 100,000 populations [4]. According to the center for disease control there is an estimated 9000–11500 cases of necrotizing fasciitis occurring each year in the United States.

LRINEC, also known as lab risk indicator for necrotizing fasciitis, was developed to distinguish necrotizing fasciitis from severe cellulitis or abscess [5]. The parameters included are presented in

(Table 1) and according to the points presented the approximate risk of having necrotizing fasciitis is provided in (Table 2).

Risk factors for necrotizing fasciitis include poorly controlled diabetes, alcoholism, obesity, immune suppression, and chronic illness.

Diagnosis of necrotizing fasciitis can be difficult and requires a high degree of clinical suspicion. In many cases of necrotizing fasciitis, antecedent trauma or surgery can be identified. The hallmark of the disease is pain out of proportion of the findings and tenderness over involved skin and underlying muscle.

Misdiagnosis and delayed treatment can result in severe systemic toxicity, carotid artery erosion, jugular vein thrombophlebitis, aspiration pneumonia, meningitis and mediastinitis. The mortality rate is 15%–40%. The foundation for successful treatment of this life-threatening condition consists of early diagnosis and aggressive surgical intervention combined with supportive therapy such as appropriate antibiotics, airway maintenance and adjunctive hyperbaric oxygen therapy. Computed tomography (CT) is a very useful tool for early diagnosis because it detects gas bubbles which can be difficult to see on plain radiographs.

We reported two cases of necrotizing fasciitis, which extensively involved the head and neck region with different sources of infection and outcomes relating to the lab results according to LRINEC score.

The work has been reported in line with the PROCESS criteria [9], and SCARE criteria [10].

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Table 1
LRINEC score parameters.

Criteria	Value	Points
CRP (mg/L)	<150	0
	≥150	+4
WBC per mm ³	<15	0
	15–25	+1
	>25	+2
Hemoglobin (g/dL)	>13.5	0
	11–13.5	+1
Sodium	<11	+2
	≥135	0
Creatinine	<135	+2
	≤1.6 mg/dL/141 mmol/L	0
Glucose	>1.6 mg/dL/141 mmol/L	+2
	≤180 mg/dL/10 mmol/L	0
	>180 mg/dL/10 mmol/L	+1

Table 2
LRINEC score interpretation.

Risk	%	Score
Low	<50	Less than or equal 5
Moderate	50–75	6–7
High	>75	More than or equal 8

2. Case reports

2.1. Case study 1

A 50 years old Indian female with poorly controlled diabetes presented to the Otolaryngology emergency department on 19/3/2016, with chief complaints of progressively increasing swelling in the left side of the neck for 3–4 days, low grade fever, generalized weakness, and severe pain out of proportion of the findings.

The patient had no history of neck trauma, with a positive history of neck swelling.

The patient had no drug history as she was not controlling her diabetes, family history or previous medical history.

On admission the patient was conscious, oriented to person place and time. Her vitals were, heart rate 118 beats per minutes, blood pressure 170/80, temperature 40 and her respiratory rate 18.

While reviewing her systemic examination it was unremarkable.

Regarding the local examination of the neck, the size was Approximately 7 × 5 cm with diffuse margins with mild crepitus (Fig. 1). A diffuse swelling involving left aspect of neck in left anterior triangle and part of posterior triangle as well crossing the midline and occupying a part of right anterior triangle.

Her labs were, CBC: WBC 18.1 with neutrophilic predominance, Hg 10.9, normal platelets, CRP 287, Glucose- 51.4, sodium 137, creatinine 46.

Our differential diagnoses for this patient were necrotizing fasciitis, tuberculosis, deep neck space infection or abscess.

The patient was shifted for an urgent CT scan and it showed features highly suggestive of necrotizing fasciitis for clinical correlation (Fig. 2). A LRINEC score was obtained for the patient and it showed a score of 7 out of 15 giving a moderate risk of having necrotizing fasciitis.

The patient was immediately shifted to the operation theatre for surgical intervention and debridement to be done by our otolaryngology team. During surgery it was found that there is severe tissue necrosis with gas formation and foul pus formation (Fig. 3). The patient was then intubated after the surgery to protect the airways and the wound was debrided daily in the ICU.

Histopathology report of necrotic tissue showed presence of acute suppurative inflammation with bacterial colonies, Klebsiella



Fig. 1. Picture of case 1 patients mass pre op.

pneumonia, but stains of fungi and acid fast bacilli were negative.

She was started on triple antibiotic therapy according to her microbiology report, metronidazole, tazocin, and meropenem with good tolerability.

Patient improved over the period of one month in the hospital and was discharged in good general condition with a LRINEC score of 2 out of 15 after one month. The patient was advised for regular follow up with our team and medical team regarding the control of diabetes.

2.2. Case study 2

A 58 years old Egyptian male was found on 31/7/16 in his apartment on the floor after not attending duty for 4 days. On presentation the patient was found lying on the floor with a foul smell. On admission he was drowsy, maintaining saturation in room air and his vitals were heart rate 160 beats per minute, blood pressure 127/70, with a temperature of 37.8.

He had a 7 days' history of bilateral diffuse swelling in sub-mandibular region extending to neck. The swelling was erythematous, warm, tender, with crepitation in whole neck extending to anterior chest wall. The patient had history of bad oral hygiene with diffuse gingivitis and a lot of slough. The patient had no drug history, family history or previous medical history.

His labs on admission were CRP 394, WBC 18, Hb 141, Na 135, creatinine 73, glucose 20.84, giving a total score of 6 out of 15 with LRINEC showing a moderate risk of having necrotizing fasciitis.

The patient was admitted to the ICU with urgent CT scan and started on tavanic, metronidazol, and insulin sliding scale regarding his elevated blood sugar. The medications were tolerated well. CT scan showed retropharyngeal abscess with diffuse necrotizing fasciitis (Figs. 4–10) so the patient was taken to the operation theatre on the same day where aggressive debridement was done by our otolaryngology team (Fig. 11) and tracheostomy was inserted.

In the following day, post op day 1, the skin over the anterior neck and left side of the face was discolored and appeared black and necrosed. The necrosed area and muscles were debrided in the operation theatre and the wound was kept open, with continuation

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