Spontaneous bilateral necrotizing fasciitis of the forearm: A case report

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E Kiriakopolous, MH Brown, JA Starr, PJ Choptiany, B Mederski. Spontaneous bilateral necrotizing fasciitis of the forearm: A case report. Can J Plast Surg 1997;5(4):246-248. Necrotizing soft tissue infections are seen with relative frequency. A case of spontaneous, bilateral necrotizing fasciitis of the forearms in an otherwise healthy 17-year-old male is reported. It is thought to be the only reported case of spontaneous bilateral necrotizing fasciitis.

Key Words: *Necrotizing fasciitis, Soft tissue infection*

Fasciite nécrosante bilatérale spontanée à l'avant-bras : rapport de cas

RÉSUMÉ : Les infections nécrosantes des tissus mous s'observent avec une fréquence relative. Nous signalons ici un cas de fasciite nécrosante bilatérale spontanée des avant-bras chez un jeune homme de 17 ans par ailleurs en bonne santé. Il s'agirait du seul cas signalé de fasciite nécrosante bilatérale spontanée.

Necrotizing fasciitis is a severe and potentially life-threatening soft tissue infection that is characterized by rapidly progressive necrosis of subcutaneous tissues and fascia. We report a 17-year-old male who presented to the emergency department with bilateral necrotizing fasciitis of the forearms. To our knowledge, such a presentation has not been previously reported.

The patient presented to the emergency department with progressive symptoms of fever, chills and increasing numbness, erythema and pain of the right forearm. These symptoms began in the morning when the patient left for school. Over the next several hours, the tenderness in his arm increased and he began to feel worse. He complained of severe light-headedness and was taken to the emergency department. There was no history of significant previous medical illness, and specifically no history of diabetes. There was no history of recent trauma or intravenous drug use.

Examination revealed a tense erythema of the right forearm extending distally over the volar aspect of the wrist and

Figure 1) Clinical photograph of right forearm demonstrating erythema and swelling

proximally to just above the elbow (Figure 1). There were no nodes to palpate in the axilla. Range of motion of the right wrist and fingers was minimal, and the patient demonstrated acute carpal tunnel syndrome with numbness in the distribution of the median nerve. The patient appeared flushed and unwell. His blood pressure was 110/60 mmHg, pulse was

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Figure 2) Radiograph of right forearm demonstrating gas within the soft tissues

Figure 3) Clinical photograph of left forearm demonstrating erythema and swelling

100 beats/min and regular, temperature was 39.7°C and white blood cell count was $16 \times 10^9/L$. X-ray examination revealed gas in the soft tissues of the right forearm (Figure 2).

A diagnosis of right-sided necrotizing fasciitis was made and arrangements were made to take the patient to the operating room. At this time, the patient complained of discomfort in the left forearm.

Examination revealed that, in the previous hour, redness and swelling had begun in the region of the left antecubital fossa (Figure 3). Range of motion in the elbow became quite limited and streaking was present proximally in the left arm. No axillary nodes were palpable. The clinical picture on the left arm was strikingly similar to that on the right, and a diagnosis of bilateral necrotizing fasciitis was made. Blood cultures were drawn, and the patient was started on high dose intravenous penicillin and clindamycin. In conjunction with consultation from an infectious disease specialist, an infusion of high dose intravenous immunoglobulin (1 g/kg) was initiated because of the possibility that the infection was the result of group A streptococcus.

The patient was taken to the operating room, and a lazy S incision was made from the right antecubital fossa to the wrist and extended distally to allow for carpal tunnel release. Dissection through the skin and subcutaneous adipose layers

Figure 4) Intraoperative photograph of right forearm demonstrating necrosis of fat, fascia and proximal muscle

Figure 5) Intraoperative photograph of left antecubital fossa demonstrating necrotic fat and underlying fascia.

was completed through to the level of the fascia. The majority of subcutaneous tissue was grossly necrotic. There was marked necrosis of the fascia and underlying muscle that demonstrated evidence of patchy necrosis (Figure 4). Carpal tunnel release was completed, and the median nerve appeared normal despite being surrounded by necrotic connective tissue. A Guyon's canal release was performed, and the right ulnar artery and nerve appeared intact. The necrotic muscle and fascia were debrided and the wounds thoroughly irrigated.

Exploration of the left upper extremity was then undertaken with a lazy S incision made over the antecubital fossa where the tissue was quite tense. Again, there was significant necrosis within the fat, and the underlying fascia was grossly necrotic. No evidence of muscle necrosis was seen on the left arm (Figure 5).

Tissue cultures and swabs were sent to the laboratory for analysis. The wounds were dressed with povidone-iodine soaked gauze, dry gauze and plaster slabs. The patient continued on intravenous therapy with penicillin, clindamycin and immunoglobulin.

Subsequently, the patient underwent four further surgical procedures to debride and irrigate the wounds and to apply sterile dressings. Fourteen days after the initial surgery the

patient underwent definitive wound closure using a combination of direct closure and skin grafts. The patient underwent postsurgical physiotherapy and has regained full function in both upper extremities. Blood cultures taken before initiation of antibiotics, and tissue cultures taken during the initial operation but after the first doses of antibiotic were given, were negative for microorganisms.

DISCUSSION

In its earliest descriptions, necrotizing fasciitis was thought to be caused by beta-hemolytic streptococcus. However, it is now thought to be more frequently due to a polymicrobial infection with aerobes and anaerobes (1). The accepted treatment protocol for necrotizing fasciitis consists of a combined medical and surgical approach (2).

Early diagnosis and treatment is critical. In a retrospective analysis of 29 cases, Lille et al (3), reported a 6% mortality rate in patients who are diagnosed and operated on within 24 h versus a 25% mortality in those who receive treatment after this 24 h window. Delayed operation was more common in patients who had absence of findings on radiological examination and a negative fine-needle aspirate on admission to hospital (3). Imaging modalities including computed tomography and magnetic resonance imaging are evolving and becoming more routine for diagnosing soft tissue infections,

but clinical assessment remains the hallmark of early diagnosis (4,5).

This case is unique in its report of a bilateral presentation of necrotizing fasciitis. The patient did not demonstrate any underlying medical disorder that would predispose him to this condition, and there was no history of a traumatic insult. It remains unclear why this previously healthy 17-year-old high school student developed bilateral upper extremity life-threatening infections. Early diagnosis using clinical, radiological and laboratory data, and treatment with broad-spectrum antibiotics and immunoglobulin in combination with early definitive surgical management allowed for a good outcome.

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