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Role of X-rays in diagnosing advanced Necrotizing Fasciitis

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Patient: 42-year-old male
Section: Musculoskeletal system
Area of Interest: Radiology, Trauma and Orthopaedics
Imaging Technique: X-ray

Case Summary

This is a 42-year-old patient who was brought in by ambulance to ED with diabetic ketoacidosis and ulcer on left foot. His friends were visiting and noticed that he has been a bit drowsy and has pain/ulceration on left foot. They called the ambulance and patient was transferred to the hospital right away in early hours of the morning. He had a background of type 2 diabetes mellitus and hypertension. He was on oral medications only and not on insulin.

When seen in ED, patient was alert and oriented; he gave a full history and mentioned he started noticing a wound on the planter aspect of his left foot few days ago. Although he was not sure how long, this ulcer has been there for exactly because it was on the sole of his foot and he does not inspect that area regularly. From this information, we assumed that the ulcer on the planter aspect of left foot was not acute. On examination of the dorsum of foot, we noticed some peeling off skin and blistering on the dorsal aspect, necrotic-pigmented tissue with surrounding cellulitis, foul smelling bloody discharge and severe tenderness. The peripheries were still well perfused & warm, distal pulses were vaguely felt and capillary refill time was less than 2 seconds. Sensations were intact and he was able to move his toes to some extent but range of movement was restricted due to pain.

Right away, there was concern of Necrotizing Fasciitis because of the clinical picture and history of immunosuppression (T2DM). Other differential diagnosis was infected wound with a collection and cellulitis. We proceeded with calculating the LRINEC score (Laboratory risk indicator for necrotizing fasciitis score). LRINEC score has a sensitivity of 80% and specificity of 67% [1]. Our patient had a score of 6. Patient with a LRINEC score of 6 or over should be carefully evaluated for the presence of necrotising fasciitis [2]. The recommendations from a LRINEC score of 6 were:

'Consider urgent MRI, frozen section biopsy or finger test (manual probing of area in question under local anaesthesia). If positive, emergent operative debridement. If negative, IV antibiotics, close observation, serial labs'.

Unfortunately, it was early hours of the morning and in our hospital, we cannot get the MRI done right away during those hours, and it was the case for frozen section biopsy. This meant for confirmation of diagnosis and treatment we would have to proceed without MRI and biopsy. Fortunately, an urgent x-ray of the foot was suggested and done. X-ray of the foot demonstrated extensive entrapment of air in the soft tissue. Even though on palpation of skin clear crepitus was not demonstrated, the x-rays very clearly identified trapped air suggesting anaerobic growth. Broad-spectrum antibiotics were started in the meantime to provide cover. LRINEC score and clinical picture combined with these crucial x-ray findings prompted the T&O team to take the patient to theatre urgently for operative debridement, even though MRI and Biopsy were not done.

Left foot x-rays were later reported by the radiology team that day as:
'Air in soft tissue noted throughout the forefoot and extending towards the base of the fifth metatarsal on the lateral aspect.

No plain film evidence of bone destruction or periosteal reaction to suggest bony involvement'

Figure 1

Figure 2

The patient was managed under medical team for DKA and T&O for Necrotising Fasciitis. Trans metatarsal amputation was done (Figure 1 and 2) to control infection and patient was referred to plastic surgery team free flap coverage after a CT angiogram of lower limbs was done to check viability of vasculature:

'Angiogram visualised abdominal aorta, right and left common iliac, both common femoral, superficial femoral and popliteal arteries as normal. Anterior and posterior tibial arteries were also seen normally with no abrupt cut-off'.

Histopathology findings from the sample taken intra op mentioned: 'This is skin and subcutaneous tissue showing mainly deep necrotizing inflammation with secondary abscess formation and confluent zones of tissue necrosis. There is acute osteomyelitis and septic venous thrombi are seen. The appearances are in keeping with the clinical diagnosis of necrotizing fasciitis'.

Microbiology report from culture and sensitivity showed growth of: 1) Mixed anaerobic bacteria, 2) Streptococcus Lancefield group B, 3) Staphylococcus aureus, 4) Streptococcus oralis, 5) Granulicatella adiacens. Antibiotics were adjusted according to the culture and sensitivity, and patient was placed on IV meropenem and clindamycin. In the following week, his CRP came down to from 301 to 19.

Discussion

Necrotising fasciitis is a life threatening, rapidly spreading, inflammatory infection of the deep fascia. Delay in diagnosis and surgical management is associated with increased mortality [3]. The infection can rapidly destroy the skin and soft tissue beneath it, this is the reason it is sometimes referred to as ‘flesh-eating disease’. It carries a morbidity and mortality rate of about 70%. Early diagnosis combined with emergent surgical debridement, appropriate broad-spectrum empiric antibiotic treatment, and a multidisciplinary team approach is essential for a successful outcome.

This case demonstrates how x-ray findings in advanced Necrotising fasciitis can help with the timely diagnosis when MRI or biopsy cannot be arranged urgently. Although, compared to plain radiography, Ultrasound CT and MRI provide higher sensitivity and specificity for diagnosis of necrotising Fasciitis [4]. However, x-rays are a low coast and readily available modality, and should be done in patients where Necrotising Fasciitis is suspected and where an urgent MRI/frozen section biopsy are not available readily, as suggested by this case. A delay in debridement due to MRI or Biopsy in this case would have led to further spread of infection proximally, and patient would require more aggressive amputation [5]. Whereas in this case urgent x-rays confirmed the diagnosis early and led to only trans metatarsal amputation and also proved lifesaving.

References

1. Chin-Ho Wong, Lay-Wai Khin, Kien-Seng Heng, et al. The LRINEC score: a tool for distinguishing necrotizing fasciitis from other soft tissue infections. Crit Care Med. 2004; 32: 1535-1541.
2. Holland M. Application of the Laboratory Risk Indicator in Necrotising Fasciitis (LRINEC) score to patients in a tropical tertiary referral center. Anaesth Intensive Care. 2009; 37: 588-5892.
3. Fernando SM, Tran A, Cheng W, et al. Necrotizing Soft Tissue Infection: Diagnostic Accuracy of Physical Examination, Imaging, and LRINEC Score: A Systematic Review and Meta-Analysis. Ann Surg. 2019; 269: 58-65.
4. Tso DK, Singh AK. Necrotizing fasciitis of the lower extremity: imaging pearls and pitfalls. The British Journal of Radiology. 2018; 91: 1088.
5. Chun T Liao, Yi-Kung Lee, Yung-Cheng Su, et al. Validation of the laboratory risk indicator for necrotizing fasciitis (LRINEC) score for early diagnosis of necrotizing fasciitis. Tzu Chi Medical Journal. 2012; 24: 73-76.