ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

An elderly patient on haemodialysis with necrotising soft tissue infection of left upper limb

Aditya K Agrawal, Chong SiJack, Tay Shian Chao

Manuscript Info

Manuscript History:

Received: 15 August 2015
Final Accepted: 19 September 2015
Published Online: October 2015

Key words:

haemodialysis; arteriovenous fistula; necrotising soft tissue infection

Corresponding Author

Aditya K Agrawal

Abstract

Necrotising fasciitis is one of the non traumatic orthopaedic/surgical emergencies where a multi-disciplinary team comprising of the surgeons, internal medicine physicians and the anaesthetists/ intensivists should be involved immediately to optimise the patient care in the perioperative period. We present a case of multifocal, non-contiguous pyomyositis in an elderly lady with multiple co-morbidities. The patient was treated with radical excisional debridement and was discharged well after 2 weeks of admission. This case is a diagnostic dilemma because patient was in septic shock with abscess over brachiocephalic fistula and severe tenderness in the distal half of forearm, which was not in continuity with the extent of abscess. Trauma does not appear to be an important association with pyomyositis, which is one of the rare variants of necrotising soft tissue infection. Also, as far as we can determine, this is potentially first case of suppurative pyomyositis arising from septic emboli seeding from an infective and partially thrombosed AVF.

INTRODUCTION

Necrotising soft tissue infection is a suppurative infectious disease of the skeletal muscle and overlying fascia especially common in patients of the tropical countries. We present a case of multifocal, non-contiguous pyomyositis in an elderly lady with multiple co-morbidities including diabetes, end-stage renal failure (ESRF) with infected arteriovenous (AV) dialysis fistula and pseudo aneurysm [1].

Case Report:

A 63 year old lady with End Stage Renal Failure (ESRF) presented with pain and swelling in her left upper limb on 10/10/13, with Body Temperature of 37.5°c, Pulse 115/min, Blood Pressure of 94/46 mmHg, Respiratory rate 28/min. and an obvious pointing abscess over the AVF in her arm [fig1].

The AVF had bruit and it had swollen with surrounding induration suggestive of partial thrombosis for 5 days prior to admission. On presentation to the hospital, she was found dehydrated and with poor cognition (Glasgow Coma scale of 8) requiring inotropic support in emergency ward.

Figure 1 : Left upper limb of the patient at the time admission

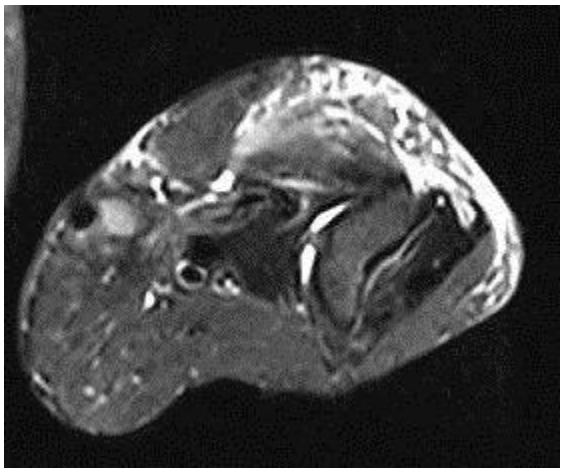

Figure 2 : Axial MRI T2 image with radio enhancing lesions in muscle belly and the overlying fascia

Her Total count was 30.4 x 10^9/L, CRP >380mg/L, uric acid 316 Umol/L. LRINEC (Laboratory Risk indicator for necrotising fasciitis) score was 12/13 [2].Initially, it was thought that the infection was simply in AVF and the physicians were asked to look for other sources of infection. The patient was reviewed again within 2 hours by orthopaedic team in intermediate care unit and it was found that she had intense tenderness over the dorsum of left wrist, extensor surface of left forearm extending proximally to the elbow joint. No history was suggestive of trauma. There was no evidence of skin blistering, erythema or fluctuance. The team then felt it like a gouty or inflammatory arthritis of the wrist with extensor tenosynovitis of the left forearm and some kind of vascular seeding from an infective AVF. Urgent MRI of left arm, forearm, wrist and hand was ordered to exclude deep seated infection and surgical collection in the hand, wrist and forearm.

MRI showed extensive subcutaneous soft tissue oedema mainly at the dorsal aspect of the wrist extending to the hand consistent with cellulitis, oedema of the small muscles of the hand suggestive of necrotising fasciitis, large effusions in extensor pollicis longus and extensor indicis tendon sheaths, moderate effusions in extensor carpi radialis longus/brevis and extensor digitorum tendon sheaths suggestive of tenosynovitis. There were degenerative changes in the radio carpal, intercarpal and 1st CMC joints with no significant joint effusion.

Intraoperatively, we found suppurative pyomyositis involving the extensor compartment muscles ECRL, ECRB, EIP(Extensor Indicis Propius), EDC(Extensor Digitorum Communis), EPL(Extensor Pollicis Longus), APL(Abductor Pollicis Longus), EPB(Extensor Pollicis Brevis), PIA(Posterior Interosseous Artery), PIN(Posterior Interosseous Nerve) in a non-contiguous fashion suggestive of vascular seeding from infective AVF with intact intervening fascial planes.[Fig.3].

Figure 3 : Unhealthy extensor compartment muscles with collection of pus pockets

The AV fistula was then debrided and Negative Pressure Wound Therapy (NPWT) was applied to all the wounds over the left upper limb.

Intravenous empirical antibiotic treatment consisted of Augmentin on day1, Meropenam and Vancomycin for 4 days and Linezolid then on as per tissue cultures. Haemodialysis was performed via opposite site indwelling vascath every day. The patient's overall condition improved as well as her left upper limb wounds were closed within 1 week. The patient remained on ventilator and inotropes for first 2 days. She was subsequently discharged well home after 2 weeks of hospitalization and is doing well in her subsequent clinical follow-ups.

Discussion:

1. Classical findings of erythema or fluctuance were not present in distal forearm in this patient. Positive clinical findings due to deep seated nature of infection were noted as pain with passive extension at the left wrist joint.
2. Necrotising fasciitis is common in elderly patients, who are malnourished, having many co morbid conditions like diabetes, chronic renal failure and thereby less immune to highly pathogenic bacteria like staphylococci, streptococci.
3. The suppurative pyomyositis is a rare variant of necrotising fasciitis with aggressive infection of the soft tissues. The pathological hallmark of the condition is the non-contiguous areas of pustules over the muscles. The necrosis may also involve skin, subcutaneous tissues and the underlying muscles through haematogenous spread. The commonest organism implicated is *Staphylococcus aureus* [4].
4. Necrotising soft tissue infections can occur in any region of the body. It may be related to previous skin ulcers and in rare instances trivial trauma like abrasions from a fall or unnoticed needle stick injury, especially in the elderly population. Pain in the affected region is often accompanied by oedema and cellulitis. Deep seated tenderness over the muscle and the joint may be the early manifestations leading to purplish pigmentation and blisters over the skin which occur when full blown infection has already set in.
5. Infected AVF was a red herring in the above mentioned case diverting the doctor's attention from more severe problem in distal forearm. The differential diagnosis included compartment syndrome, inflammatory arthritis of the wrist and elbow joints. So, unfamiliarity with the disease and atypical manifestation often result in a delay in diagnosis. Ultrasound, computed tomography and magnetic resonance imaging (MRI) are thereby useful in establishing a correct diagnosis [5, 6], as illustrated in Fig.2.
6. CRP, total count and LRINEC score can be high in these patients, which was present in this case too.
7. LRINEC (Laboratory risk indicator for necrotising fasciitis) score

Variable (units)	Score points
C-Reactive Protein (CRP) (mg/L)	
< 150	0
>150	4
White blood cell count (per mm^3)	
<15	0
15-25	1
>25	2
Haemoglobin (g/dl)	
>13.5	0
11-13.5	1
<11	2
Sodium (mmol/L)	
=135	0
<135	2

Creatinine =141 μmol/L (1.6 mg/dl) >141 μmol/L (1.6 mg/dl)	 0 2
Glucose =10 mmol/L (180 mg/dl) >10 mmol/L (180 mg/dl)	 0 1

8. In 2004, Chin-Ho Wong *et al* described patients based on LRINEC score as low risk (<5 points); intermediate risk (6-7 points); and high risk (=8 points).Internal validation revealed that at a cut off of =6 had a PPV of 92% and a NPV of 96%. Scores =8 strongly suggestive of NSTI (PPV 93.4%).
9. The muscles involved in the abovementioned patient are in distribution of posterior interosseous artery (PIA). PIA is only present in the proximal half of the forearm. In the distal part, the dorsal branch of the anterior interosseous artery forms a vascular arcade, which gives off branches to the dorsal carpal arch, the ulnar head and the ulnar artery. This arcade anastomoses with the posterior interosseous artery in the middle of the forearm by means of a choke anastomosis by the recurrent branch of the anterior interosseous artery [7].The question why only muscles in the posterior interosseous arterial distribution were affected in this patient is still controversial.
10. Finally, despite adequate treatment and resolution of their upper limb infections, up to one third of these patients die of unrelated causes within 5 years and a quarter within a year [8] .

References:

1.Deborah J.V, A.R.N Rao, J.R Johnson, A.G.R Sheil; A patient on haemodialysis with necrotising fasciitis of the left arm; *Nephrol Dial Transplant* (1998) 13:781-783.

2. Chin-Ho Wong, Lay-Wai Khin, Kien-Seng Heng, Kok-Chai Tan, Cheng-Ooi Low: The LRINEC (Laboratory Risk Indicator for Necrotizing Fasciitis) score: A tool for distinguishing necrotizing fasciitis from other soft tissue infections: *Crit Care Med* 2004, Vol 32, No.7, 1535-1541

3. Germaine G Xu, Andrew Yam, Lam C T, Fok C Y, Tay S C. Epidemiology and Management of Surgical upper limb infections in patients with end stage renal failure; *Annals Academy of Medicine* 2010;39;670-74

4. Christin L, Sarosi GA. Pyomyositis in North America: case reports and review. *Clin Infect Dis* 1992; 15: 668-77**.**

5. Trusen A, Beissert M, Schultz G, et al. Ultrasound and MRI features of pyomyositis in children. *Eur Radiol* 2003; 13:1050-5.

6. Gordon BA, Martinez S, Collins AJ. Pyomyositis: characteristics at CT and MR imaging. *Radiology clinics*1995; 197:279-86.

7.Hubmer MG, Fasching T, Haas F, Koch H, Schwarzl F, Weiglein A, Scharnagl E :The posterior interosseous artery in the distal part of the forearm. Is the term "recurrent branch of the anterior interosseous artery" justified; *Journal of Plastic Surgery*: Oct 2004; 57(7):638-44

8. Phoon ES, Sebastin SJ, Tay SC: Primary pyomyositis (Bacterial myositis) of the pronator quadratus: *J Hand Surg Eur* Vol 34:549, 2009 549-51.