Necrotizing fasciitis: a case of hip disarticulation in a postnatal intravenous drug abuser

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Summary: An interesting case of necrotizing fasciitis of the leg following emergency caesarian section in a known intravenous drug user. Postnatal day two she developed pain and swelling in the left leg. In view of her previous history, deep vein thrombosis (DVT) was the initial diagnosis. But, due to clinically worsening symptoms and no response to anticoagulation, further investigations were done which showed necrotizing fasciitis. Due to disease progression, a hip disarticulation was performed and the patient went on to full recovery.

Keywords: pregnancy, necrotizing fasciitis, drug abuse, disarticulation

CASE REPORT

A 28-year-old woman, gravida 4 para 3, known intravenous (i.v.) drug user was attending a routine hospital antenatal clinic appointment at 32 weeks to assess fetal growth and review her substance use. She appeared stable and compliant with her methadone, although still injecting a small amount of heroin on occasions. This was confirmed on urine drug screening. A fetal ultrasound scan showed reduced growth and reduced liquor volume. No fetal movement was observed on scan. Subsequent cardiotocograph monitoring was pathological, with reduced variability and unprovoked variable decelerations. Delivery was advised and caesarean section was recommended as she had three previous caesarean sections. A caesarean section was performed without immediate complication. A small male baby, birth weight 1.52 kg, with Apgar scores of 9 at one minute and 10 at five minutes was delivered and transferred to neonatal intensive care unit. All cultures done on the baby were negative and he did not receive any antibiotics. The patient's past medical history included a left leg deep venous thrombosis (DVT) in 2007 and a lung abscess in 2007, both considered to be secondary to her i.v. drug use.

Postnatal day two the patient developed left thigh pain. In view of her previous medical history, the working diagnosis was DVT and low-molecular weight heparin 70 mg b.i.d. was started. On the following day, a venous lower limb Doppler showed no evidence of DVT and the patient became pyrexial at 38.1°. Blood cultures were requested on day three, but due to poor venous access were not done until day five. She also developed erythema and swelling with a 9 cm discrepancy in thigh circumference between left and right. Flucloxacillin was commenced orally.

The white cell count was normal and, on postnatal day four, the patient became apyrexial. In view of this, the clinical

findings and her past history, the working diagnosis of DVT remained and low-molecular weight heparin 70 mg b.i.d. continued.

Following a second negative Doppler on day six and worsening clinical symptoms of increasing pain, redness, swelling and further temperature spikes, a radiological opinion was sought and a computed tomography scan was performed on day

Figure 1 Computed tomographic images showing multiple air and fluid pockets

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eight. This showed multiple air and fluid collections, extending throughout the thigh, down to the knee and into the calf (Figures 1A and 1B). A diagnosis of necrotizing fasciitis was made, i.v. benzyl penicillin, gentamicin and metronidazole were given and a surgical review was requested. On day 10, all investigations including urea, electrolytes, coagulation profile, liver function tests and creatine kinase remained normal. The following day, an orthopaedic review was sought and the patient was taken to the theatre for fasciotomy and debridement of necrotic tissue and admitted to intensive care. Despite repeated debridements, in view of muscle necrosis extending to the inguinal ligament and extensive muscle necrosis of the thigh, a hip disarticulation was performed. The patient required ventilation for four days and received a 4 U blood transfusion.

Cultures from the wound sample grew *Staphylococcus aureus*, beta-haemolytic streptococcus group C, anaerobic Streptococcus and Bacteroides species and appropriate antibiotics were continued. Repeated wound inspections under anaesthetic did not show any further spread.

The patient was discharged from intensive care on day 18 and discharged from hospital mobilizing in a wheelchair on day 50. She is currently progressing well, prosthesis has been fitted and her house has been appropriately modified. Her baby has had an uncomplicated course and maternal urine drug screens have been negative.

DISCUSSION

Necrotizing fasciitis is a rare infection of the deeper layers of skin and subcutaneous tissues, easily spreading across the fascial plane within the subcutaneous tissue.¹ Many types of bacteria can cause necrotizing fasciitis, e.g. group A streptococcus, *Clostridium perfringens*, *Bacteroides fragilis*, of which group A streptococcus (also known as *Streptococcus pyogenes*) is the most common cause.² Organisms spread from the subcutaneous tissue along the superficial and deep fascial planes, presumably facilitated by bacterial enzymes and toxins. This deep infection causes vascular occlusion, ischaemia and tissue necrosis. Superficial nerves are damaged, producing the characteristic localized anaesthesia. Septicaemia ensues with systemic toxicity.^{2,3}

Mortality rates have been noted as high as 73%. Certain conditions can predispose patients to necrotizing fasciitis, such as diabetes mellitus, immunosuppressive medications, i.v. drug abuse and AIDS.^{4,5} The portal of entry for bacteria causing necrotizing fasciitis is varied. Any condition in which the integrity of the integument is compromised can permit the entrance of bacteria and the subsequent development of necrotizing fasciitis. In this case, the patient had recently been using the groin as an injection site and the CT scan showed evidence of fibrosis in the veins around the groin due to repeated injections.

In this case, the likely pathology was deep i.v. injection into the fibrotic vein, combined with blood stasis, allowing bacteria to colonise and multiply with subsequent spread into the deep

Table 1 Differentiating features of necrotizing fasciitis and deep vein thrombosis

Signs and symptoms	Necrotizing fasciitis	Deep vein thrombosis
Erythema/redness	++	+
Swelling of the limb	++	+
Pain	++	+
Skin discolouration	++	+
Fever/systemic reaction	+	—
Tissue necrosis	+	—
Putrid discharge	+	—
++, more significant; +, present; —, absent		

fascial planes. This is further evidenced by the bacteria isolated, being skin and gut commensals, that are commonly found in the groin region.

In pregnancy, necrotizing fasciitis can develop following caesarean sections, episiotomies and tubal ligations. Most commonly, necrotizing fasciitis develops in the abdominal wall, extremities (arms and legs) and perineum. In women, the infection typically begins in the vulva and then spreads to the perineum, buttocks and abdominal wall. It is more common in obese and diabetic women. The infectious organism may invade the affected area in a number of ways, directly through the skin, spreading from surrounding structures such as the bladder or rectum or as a complication of catheters or drains placed through the skin.

The key learning point from this case is that although thromboembolic disease is a leading cause of maternal mortality, especially in i.v. drug users, it is important to consider other differential diagnoses including superficial and deep tissue infections.⁶ In the case of necrotizing fasciitis, spread is rapid and regular. Thorough clinical examination and monitoring of vital signs are mandatory. Early involvement of a multidisciplinary team, including radiologist, microbiologist and surgeons, would aid in appropriate investigations and early diagnosis (Table 1).

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