CASE REPORT

Necrotising fasciitis of the thigh

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SUMMARY

Necrotising fasciitis (NF) is an extremely virulent form of infectious fasciitis. It affects skin, subcutaneous fat and superficial and deep muscular fascia by rapidly progressive necrosis. Expedient diagnosis and radical debridement is necessary to prevent the onset of sepsis, multisystem organ failure and possible death. Perforated rectal cancer resulting in NF can spread to the perineum and genitals known as Fournier gangrene. This case describes an unusual case of NF of the right thigh as first presentation highly suggestive for rectal cancer.

BACKGROUND

In patients who present with necrotising fasciitis (NF) of the thigh and have a history of weight loss with rectal bleeding, a malignancy should be suspected. Although NF is a clinical diagnosis, CT scan can guide surgical management by evaluating the extent of the disease.

CASE PRESENTATION

A 66-year-old man, with a history of myocardial infarction, alcohol and tobacco abuse, presented to the emergency department of Ziekenhuisgroep Twente Almelo with general weakness. The patient used β -blockers, calcium antagonists and salicylic acid. He lost 20 kg of body weight. He had recurrent rectal bleeding and complained of nocturnal sweating since a few months.

Physical examination revealed erythematous, warm and painful skin of the right buttock. He was febrile with a body temperature of 38°C, had a pulse rate of 140 bpm and a blood pressure of 136/76 mm Hg. Palpation of the abdomen showed no tenderness. Digital rectal examination (DRE) was not possible because of pain.

Laboratory findings were as follows: haemoglobin 5 mmol/L (8.5–11 mmol/L), white blood cell count 9.6×10^9 L ($4\text{--}10 \times 10^9$ L), C reactive protein 245 mg/L (<10 mg/L). Liver and renal function was within normal limits. The patient was admitted to the surgical ward with the diagnosis of erysipelas of the right buttock and treated with intravenous antibiotics (augmentin 1 g/day and gentamicine 400 mg/day intravenous) and analgesics. A colonoscopy and an abdominal CT scan was planned for the next day on suspicion of a concomitant colonic malignancy.

On the second day postadmission the erythema progressed to the back of the right knee. No blisters or crepitations were found during examination. The right buttock showed pitting oedema and the right upper and lower leg was swollen. DRE was again not possible because of pain.

Shortly after the patient became haemodynamically unstable and was transferred to the intensive care unit (ICU). After resuscitation an urgent CT scan from the abdomen to the feet was performed. This revealed diffuse massive gas in the pelvic area around the rectum extending in the right gluteal muscles and the posterior compartment of the lower right leg. The rectum wall was thickened with pathological enlarged mesorectal and para-aortic lymph nodes, suggesting a rectal carcinoma with lymph node metastases (figure 1).

Because of the extensive gas formation within the soft tissue NF was suspected and the patient was immediately operated. The posterior compartment of the right upper leg was opened extending from the buttock until the back of the knee. Dishwasher like foul-smelling fluid leaked out of the wound (figure 2). The fasciae were greyish and could easily be peeled off the muscles and were sent for culture and pathological examination. Extensive debridement was carried out. The adductor and extensor muscles were viable and left in place. During DRE a hard stenotic mass was palpated. Pelvic exploration with diverting colostomy was not performed immediately because of the haemodynamic instability and would be carried out in a second operation.

DIFFERENTIAL DIAGNOSIS

- Impetigo
- Erysipelas
- Cellulitis

NF OUTCOME AND FOLLOW-UP

After surgery the patient remained ventilated and received cardiopulmonary support with high doses of norepinephrine at the ICU. Pathological examination of the fascia showed marked necrosis and inflammation with histiocytes, neutrophilic granulocytes and lymphocytes (figure 3). Gram stain showed large numbers of Gram-positive cocci.

Blood culture examination showed growth of *Escherichia coli*. Culture of the fascia and fluid grew *E coli*, Group G haemolytic *Streptococcus* and *Candida albicans*. Antibiotics were switched to piperacillin/tazobactam and metronidazole. Despite all efforts the patient developed multiorgan failure and died 2 days postoperatively. Histological confirmation would have been carried out if oncological treatment would have followed. The first goal in treating this patient was to resolve the fasciitis by debridement.

DISCUSSION

Perforation of a rectal tumour with infection of the neighbouring spaces resulting in NF is a very rare

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Figure 1 (A) Coronal reconstruction of the CT with intravenous contrast showed marked wall thickening of the rectum. There was adjacent stranding of mesorectal fat suspected for local tumour extension. Free gas pockets in mesorectal fat (arrow) compatible with extraluminal gas by bowel perforation were detected. Additional finding showed a right-side hernia inguinalis (asterix) (B) and (C) gas in the soft tissue tracking from perianal fat into the deep fascia and superficial fascia surrounding muscle of the medial posterior compartment of the right thigh (arrowheads) (magnus gluteus magnus, magnus adductor longus and magnus, magnus semimembranosus, magnus semitendinosus). The medial posterior compartment showed also soft tissue swelling, oedema and inflammation. The scrotum or penis were not involved. No fluid collections or abscesses were detected. No lesions were seen in the liver (not shown here). Some enlarged lymph nodes were appreciated in mesenteric fat.

Figure 2 Longitudinal incision of the posterior thigh with leaking of dishwasher foul-smelling fluid and necrotic fasciae being peeled off the muscles. The dorsal aspect of the rectum could be reached through the wound.

presentation.¹ The presenting symptoms in general are changes in bowel habit, passage of blood or mucus in the stool, weakness and weight loss. Review of the English literature over the last 20 years shows 20 reports of NF as manifestation of rectal cancer.^{1–20} In 13 reports it presents as Fournier gangrene which is NF of the

Figure 3 (A) High-power photomicrograph shows necrosis of skeletal muscle and a mixed inflammatory infiltrate, which consists of lymphocytes, neutrophils, plasma cells, neutrophils and rare eosinophils. (B) Gram stain showing large numbers of Gram-positive cocci (blue dots).

perirectal, perineal or genital area.^{1 2 4–10 13 14 17 20 21} In one case the rectal cancer presented with NF of the abdominal wall.¹¹ Six reports involve NF of the thigh, similar to our case.^{3 12 15 16 18 19}

Eke *et al*²¹ described anorectal tumours as a cause of Fournier gangrene in about 2% of the cases.²¹ The reported death rate of NF varies between 3% and 80%.^{7 20} Mortality is related to the degree of sepsis and the general condition of the patient at the time of diagnosis.²² Higher death rates are also found in patients with diabetes, alcohol abuse and a colorectal source of infection, as in our patient.¹⁴

Perforated colorectal tumours represent an entry focus for bacterial translocation that might penetrate the subcutaneous soft tissues. This causes a synergistic bacterial infection involving both aerobic and anaerobic organisms, most commonly *E coli*, *Bacteroides fragilis*, *Enterococcus spp.* and mixed anaerobes.¹³

Infection arising from the rectum spreads along the Colles' fascia. If the Colles' fascia is interrupted, the infection can spread to the ischio-rectal fossa and subsequently to the buttocks and thighs. Fournier gangrene spreads anteriorly and involves the scrotum and penis. The anterior abdominal wall can also be involved^{11 22} because of thrombosis of vessels the subcutaneous fat and dermis can be gangrenous.⁷

Group G *Streptococcus* is a facultative anaerobic coccus that constitutes a part of the normal flora of human skin, respiratory tract and gastrointestinal tract.¹² Contamination of the soft tissue by Group G *Streptococcus*, as in our case, works synergistic with *E coli* to cause the fulminant NF and sepsis in our patient.

Treatment of NF is radical surgical debridement. Meleney introduced surgical debridement in 1924 and this is still the most successful treatment.²¹ The goal of the debridement is to remove all necrotic tissues, to stop the progressive infection and to reduce systemic toxicity.²¹ Debridement should be repeated when necessary. Antibiotics are only an adjunct to surgical debridement because thrombosis of the vessels prevents adequate penetration of antibiotics into the tissue.^{7 23} Some advise hyperbaric oxygen therapy when possible and available while others state it is not effective in non-clostridial infections.^{21 23} None of the reported patients discussed here received hyperbaric oxygen therapy treatment, although some authors took it in consideration.

In literature there is also no consensus among the use and timing of colostomy. Some authors say it is mandatory, others advocate their application depending on the circumstances.^{21 23} When a colostomy is inserted it is sometimes performed at the initial debridement or later. In one case there was an immediate definitive abdominoperineal resection and end colostomy was performed with good outcome.¹⁷ Colostomy promotes wound healing by protecting it from faecal spillage.

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Learning points

- Necrotising fasciitis (NF) of the thigh is a rare clinical presentation. In case of NF of the thigh and history of weight loss with rectal bleeding, a malignancy should be suspected. Although NF is a clinical diagnosis, CT scan can guide surgical management by evaluating the extent of the disease and detecting the underlying cause.^{9 22}
- High index of suspicion leading to early diagnosis and prompt surgical debridement are the cornerstones of treatment. Some advocate that all perianal cellulitis should be explored surgically.²³

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