CASE REPORT

Aeration of the abdominal wall for treatment of necrotising fasciitis

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Accepted 23 July 2014

SUMMARY

A patient diagnosed with extensive abdominal wall necrotising fasciitis from a perianal abscess was managed with a novel aeration technique using adapted 36-French tubes. A total of 14 drains were placed in the plane of the transversalis fascia after surgical debridement. The drains were left open to allow drainage of liquefactive contents and aeration of the abdominal wall tissues. An extended course of intravenous antibiotics were administered and the patient was ventilated in the intensive therapy unit. The patient was reoperated after 2 weeks, at which time the drains were removed. The patient made a full recovery, and was discharged with follow-up.

BACKGROUND

The efficacy of hyper-baric oxygen therapy for the treatment of necrotising fasciitis is well reported. Many hospitals do not have provision, nor the expertise to manage a ventilated patient in a hyper-baric setting and treatment in this manner is often unfeasible. The aeration technique described is a simple way of delivery oxygen to the affected tissues whilst allowing drainage of the liquefactive contents.

CASE PRESENTATION

A 34-year-old man presented to the surgical assessment unit with an 8-day history of perianal pain and swelling. Examination revealed a distended and mildly tender abdomen.

After drainage of the perianal abscess, the patient developed severe lower abdominal pain which radiated down his right thigh, and spiked a temperature of 39.8°C.

INVESTIGATIONS

Full blood count showed a white cell count of 8.4 and haemoglobin concentration of 126 g/L. Liver enzymes and bilirubin were raised (alkaline phosphatase 228, alanine aminotransferase 110, bilirubin 22, amylase 17). Clotting function was grossly abnormal (international normalised ratio 1.4, partial thromboplastin time 16.9, activated partial thromboplastin time APTT 49.3 APTTr 1.6, fibrinogen >12.0, D-dimer >2.19). C reactive protein measured 563. Blood cultures were negative.

Abscess culture was positive for *Escherichia coli* (resistant to amoxicillin, coamoxiclav and gentamicin, and sensitive to ciprofloxacin and Tazocin) and anaerobes (sensitive to metronidazole).

Abdominal radiographs showed free air in the abdominal wall soft tissues. A CT scan revealed multiple pockets of loculated gas in the ischio-rectal fossa, which tracked along the abdominal wall in the extraperitoneal space (below the muscle layer) up to the level of the diaphragm, and was in communication with the perianal abscess.

DIFFERENTIAL DIAGNOSIS

Only necrotising fasciitis fits the clinical pictures in this case, with free air in the abdominal soft tissues.

TREATMENT

The patient was taken to theatre for urgent surgical assessment and debridement. Nine abdominal incisions were made. One incision was made along each subcostal border, near (but not reaching) the midline, one longitudinal incision in each flank, one incision bordering the flank and iliac fossa on each side of the abdomen, one low in each iliac fossa (parallel to the inguinal ligament) and a single horizontal incision in suprapubically. The tissues were easily separated with blunt dissection, and fat tissue was widely liquefied. Necrotic subcutaneous tissues were excised, and the wounds were irrigated with copious amount of normal saline. An aeration system was designed using a total of 14 36 Fr tubes with multiples holes cut throughout their length which were placed in the plane of the transversalis fascia.

Drain 1 and 2 entered via the subcostal incision, and exited the superior iliac fossa incision. Drain 3 entered the subcostal incision and exited the flank, with drain 4 entering the flank and exiting the superior iliac fossa. These drains entered and exited the abdomen ipsilaterally. Drain 5 entered via the superior iliac fossa incision, crossed contralaterally and emerged from the low iliac fossa incision site. Each of these drains had a counterpart placed on the contralateral side of the abdomen. Four drains were placed via the suprapubic incision with their ends left in the pelvis.

In total, eight drains were placed entering the fascial plane and emerging ipsilaterally, two were placed emerging contralaterally, and four were left with ends left in the pelvis. These were covered with sterile gauzes and the patient was transferred to intensive therapy unit for ventilation.

Figure 1 is a diagrammatic representation of the abdominal incisions made, and drains placed.

A combination of intravenous antibiotics were administered based on culture sensitivities, which included Tazocin, ciprofloxacin and metronidazole.

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To cite: Koris J, Arshad A, Dennison A. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-206078

Figure 1 Diagrammatic representation of abdominal incisions and drain placements.

The patient was extubated on postoperative day 3, and made a good postoperative recovery. The patient returned to theatre after 2 weeks for removal of the drains, and was discharged home with an extended course of oral antibiotics.

OUTCOME AND FOLLOW-UP

The patient made a good recovery and was discharged 6 weeks later.

DISCUSSION

Necrotising fasciitis is a rare soft-tissue infection, with a high mortality rate (76% in some series).¹ Usually caused by toxin-

producing bacteria, the condition is often associated with widespread fascial necrosis. Bacteria may be introduced by disruption of the overlying skin, haematogenous spread, or local spread. Early diagnosis and surgery improves prognosis. The management includes antibiotics, surgical debridement.² Several studies suggest that aeration of the tissues with hyperbaric oxygen therapy improves outcome,³ although many hospitals do not have provisions for this.

The simple aeration technique described here provides aeration and drainage of the affected tissues. A similar technique was described in a single case report for the treatment of thoracic wall necrotising fasciitis⁴ with similar success.

Learning points

- ▶ Necrotising fasciitis is a life-threatening infection of soft tissues.
- ▶ Early surgical management is essential for survival.
- ▶ Treatment with hyperbaric oxygen therapy improves outcome, but not all hospitals have provision for such treatment.
- ▶ Simple prolonged aeration of the tissues with the technique described has demonstrated a successful outcome, and may be used when hyperbaric oxygen therapy is unavailable.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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