Necrotising soft-tissue infection at the inguinal region caused by a strangulated hernia: a case report

Inguinal hernia is usually repaired to avoid common complications such as incarceration and strangulation. Necrotising soft-tissue infection due to hernia perforation is a rare but life-threatening complication requiring emergency surgery

strangulated femoral hernia; necrotising soft tissue infection; hyperbaric oxygen

Inguinal hernia affects about 5% of adult men, and it is generally agreed that hernias should be electively repaired to avoid complications.[1-3] However, 5–15% of patients remain undiagnosed or are reluctant to undergo surgical correction, and as a result emergency procedures are required to correct complications.[3] The most frequent complications include:

- Incarceration and strangulation of the intestines with or without intestinal obstruction; incarceration is when the hernia is caught in the muscle tear or defect, and strangulation is injury to the blood circulation of the intestine caused by the incarceration
- Perforation of the intestine and sepsis.[2]

Necrotising soft-tissue infection is a rare but rapidly progressing infection of soft tissues, and carries a high mortality. It occurs post-injury or following surgery, particularly in patients with peritonitis or perineal sepsis.[4-7] While it has been rarely reported as a complication of hernia, it is a possible result of elective or emergency inguinal, femoral or obturator hernia repair.[4] We encountered this complication in a patient with untreated inguinal hernia that manifested as an inguinal mass and gangrene of the skin.

Case report

A 58-year-old male was admitted to our emergency clinic with a seven-day history of swelling, pain, and colour change in the inguinal region, lack of appetite, nausea and vomiting. On examination the following were noted:

- An infected, foul-smelling lesion measuring about 10 x 10cm in the inguinal region (Fig 1)
- The patient was exhausted, weak and dehydrated
- Mild abdominal distention and general pain
- There was no flatus
- The patient had not passed stools for two days
- A hypoactive intestine on auscultation
- Blood pressure was 90/60mmHg
- Pulse was 88 beats per minute (bpm).

Laboratory findings and diagnostic tests were:

- Leucocyte count: 7.2 x 10^3/µl (normal range: 4.5–10.5 x 10^3/µl)
- Haemoglobin: 12.9g/dl (11.0–18.0g/dl)
- Haematocrit: 37% (35–60%)
- Platelet count: 241,000 x 10^3/µl (150–450 x 10^3/µl)
- Sodium: 126mmol/l (135–145mmol/l)
- Potassium: 3.1mmol/l (3.5–5.5mmol/l)
- Chloride: 88mmol/l (98–110mmol/l)
- Calcium: 7.8mg/dl (8.08–10.40mg/dl)
- Total protein: 4.2g/dl (6.4–8.3g/dl)
- Albumin: 2.3g/dl (3.5–5.0g/dl)
- Plain X-rays of the abdomen/abdominal radiogram showed slim intestine-type air-liquid levels
- Abdominal computed tomography of the right inguinal region showed a hernial defect, with an intestinal segment at the distal site and ileus at the proximal site.

A nasogastric tube was passed, and parenteral fluid replacement was started to correct the patient's electrolyte deficit.

In theatre, after the first extensive excision of the infected region, it was determined that the intestinal segment at the nearby location was perforated locally and spread out to the skin (Fig 2). A laparotomy was then undertaken, with the median incision below the umbilicus. This revealed that the intestines were swollen and dilated and there was free fluid in the abdominal cavity. No intestinal perforation was noted.

We determined that the intestines located 150cm proximal to the ileocecal valve had passed through the femoral canal, become strangulated and perforated. We pulled the strangulated segment through the abdominal cavity, and extended it to the femoral canal. We then performed intestinal resection and enteroenteral anastomosis and sutured the femoral canal with 3/0 polypropylene (Prolene, Ethicon, USA) suture material. Since there was infection in the right inguinal region spreading to the fascia, extensive debridement was performed. The lesion was left open and wet gauze dressing applied (as is

H. Coskun, MD, Staff General Surgeon; **U. Demir**, MD, Staff General Surgeon; **O. Bostanci**, MD, Staff General Surgeon; **M. Mihmanli**, MD, Professor, Chief Surgeon; all at Department of General Surgery, Sisli Etfal Teaching and Research Hospital, Istanbul, Turkey. Email: halilcoskun@hotmail.com

Fig 1.View of the mass lesion and gangrene of the skin at the inguinal region

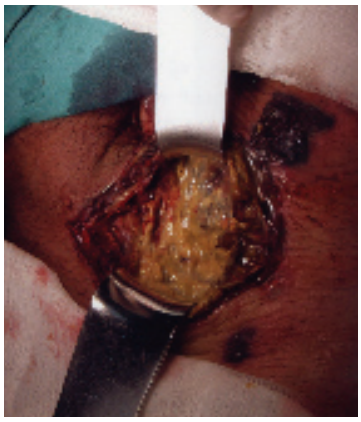

Fig 2.View of the faecaloid and purulent material spreading under the soft tissues

Fig 3.View of the inguinal area after hyperbaric oxygen treatment

routine practice for open wounds in our clinic).

On the second postoperative day, the infection and necrosis had spread to the skin and subcutaneous tissue around the wound, and to the scrotum. In theatre, necrotic skin and subcutaneous tissue around the wound and scrotum were extensively excised. As the right testis was infected, a right orchiectomy was performed. Again, the wound was left open and covered with wet gauze dressing. Culture of the excised infected material isolated *Escherichia coli* and Enterococcus-type bacteria, so meropenem 500mg three times daily (Meronem, AstraZeneca, UK) was given intravenously.

The parenteral fluid and electrolyte treatment brought the protein and electrolytes to normal levels, and on the fourth postoperative day oral feeding was started.

On the sixth postoperative day the patient began a seven-day course of hyperbaric oxygen therapy to promote healing by addressing the deficiency in the supply of nutrition and oxygen to the wound[8] (Fig 3). He breathed 25mm oxygen at 2.5atm (atmospheric pressure) for two hours, followed by air for five minutes to protect against oxygen toxicity.

On the tenth postoperative day a split-thickness skin graft was applied to the defective right inguinal region. The patient was discharged from hospital 10 days later with no complications. As complete healing was achieved, no futher dressings were needed. No pathology was observed at follow-up three months after surgery (Fig 4).

Discussion

Femoral hernias constitute 2.3% of all hernia types.[9] In clinical practice 20–40% of these present as emergencies with strangulation or incarceration.[3,10] Late hospitalisation is generally considered an important factor in determining resection and subsequent morbidity and mortality. In most cases delay in admission is due to patients' reluctance to undergo surgery, but physicians' mistakes are responsible for about 12–33% of late presentations.[3,11]

Successful management of soft-tissue infection depends on early recognition and prompt treatment — primarily surgery. When antibiotics are indicated, broad-spectrum antibiotics are initially selected.[12]

Preoperatively, fluid resuscitation, correction of systemic acidosis and electrolyte abnormalities, and cardiopulmonary and nutritional support are of prime importance, although surgery remains the most important aspect of treatment.[6] The initial surgical debridement should be aggressive. Further debridement is performed 24–28 hours later; its extent depends on the surgical findings and the evolving clinical syndrome.[12] Broad-spectrum antibiotics should be administered subsequent to intraoperative culture results.[5,7]

Hyperbaric oxygen therapy has been recommended as an adjunctive therapy[12] as it may be beneficial when the supply of nutrition and oxygen to the healing tissue are compromised by local injury.[8] Other researchershave contended that its benefits are unproven and that it should probably be avoided.[5-7] Here, the necrotising soft-tissue infection regressed after administration of the therapy.

Early diagnosis and surgery are important to avoid complications of inguinal hernia. Unfortunately, perforation, sepsis and gangrene of the soft tissues are some of the complications observed.

Extensive and repeated debridement, wet wound dressings, hyperbaric oxygen treatment and free skin-flap reconstruction could be useful for the treatment of this life-threatening situation. ■

Fig 4.View of right inguinal area three months after the skin-flap reconstruction operation

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