CASE REPORT

Retroperitoneal abscess: an extra-abdominal manifestation

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SUMMARY

Retroperitoneal abscesses are unusual occurrences with occult and insidious presentations. There is often a lack of abdominal signs, leading to delays in drainage and high mortality rates. We report a case of thigh emphysema in an 88-year-old patient with diabetes. Prior to admission the patient reported a vague 4-week history of left thigh pain and an inability to fully weight bear. She presented to our emergency department with sepsis and acute kidney impairment. An X-ray of her left femur revealed widespread gas between muscular planes. A retroperitoneal abscess involving the left renal fossa, psoas, iliacus and upper thigh muscles was revealed on an urgent CT scan. The patient was transferred to intensive care unit (ICU) and underwent an emergency drainage. Despite ICU the patient died 2 days after admission.

BACKGROUND

Retroperitoneal abscesses are conditions which have insidious developments, with symptoms occurring towards the latter phases of the illness. Interestingly they may present with a lack of abdominal signs, and in many cases become apparent once there is an extra-abdominal manifestation. Patients may report referred pain to the lower limb, painful swellings in the groin, or there may be evidence of subcutaneous emphysema on clinical examination. A clinician should always suspect an intra-abdominal pathology in any unwell patient who has presented with the mentioned extra-abdominal features.

CASE PRESENTATION

An 88-year-old woman presented to our emergency department with a fall and a 3-day history of loose motions. Sepsis and acute renal impairment were identified during investigations. There was a 4-week history of left thigh pain and an inability to weight bear. She was seen for this symptom by her family practitioner, however no diagnosis was established. Her history was significant for insulin-dependent diabetes, stage IV chronic kidney disease, a left nephrectomy due to severe pyelonephritis and a subtotal colectomy for colorectal cancer.

In the history there was no nausea or vomiting, blood in the stool or abdominal pain. From the end of the bed the patient appeared confused. On physical examination her left thigh was red, swollen and tissue crepitation was noted, without necrotic bullae. There was no evidence of abdominal signs elicited from examination. She was afebrile and the vital signs were within normal parameters. The blood results on admission revealed a leucocytosis

Figure 1 X-ray of the left femur: extensive gas distribution throughout the soft tissues extending from above the left hip joint and distally below the knee.

of $21.2 \times 10^9/L$, a glomerular filtration rate of 7.5 ml/min/1.73m², and a urea and creatinine of 45.1 mmol/L and 475 µmol/L, respectively.

On admission an X-ray (figure 1) of her left femur revealed extensive gas distribution throughout the soft tissues of the thigh. Subsequent to this finding an urgent CT was ordered, which demonstrated a large biloculated collection in the left renal fossa containing a large amount of air (figure 2). Extensive gas distribution along the left psoas and iliacus muscle was noted with distal extension into the muscles of the upper left thigh (figure 3). No other intra-abdominal pathologies were identified.

The patient was admitted directly to our intensive care unit. A drain was surgically placed into the retroperitoneum, and the pus was sent for microscopy, culture and sensitivity. The swabs revealed *Coliform* bacteria (general species).

During her postoperative period she developed multiple organ failure and underwent rapid deterioration. Ventilatory and inotropic support was required in addition to veno-venous haemofiltration. Her condition failed to improve, and after discussions with her family members the decision was made to withdraw all active treatment on the second postoperative day.

INVESTIGATIONS

Initial investigations/treatment included the following:

- ▶ Imaging—X-ray of the left femur and CT (figures 1–3);
- ▶ Admission to intensive therapy unit—invasive arterial blood pressure monitoring and oxygen therapy intravenous access: intravenous fluids and intravenous antibiotics;
- ▶ Routine blood tests;
- ▶ Nil by mouth in preparation for theatre the following day.

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Figure 2 Abdominal CT scan (transverse)—biloculated collection in the left renal fossa.

A drain was surgically placed into the retroperitoneal space and cultures of the pus were sent for microbiological assessment.

She remained intubated postoperatively and received biphasic positive airway pressure ventilation. On postoperative day 1 inotropic support was given and continuous veno-venous haemofiltration instated.

DIFFERENTIAL DIAGNOSIS

In addition to a retroperitoneal abscess, the differential diagnosis for any patient presenting with subcutaneous gas in the thigh

Figure 3 Coronal CT scan—communication of collection in the left renal fossa with the left psoas muscle along with distal spread along the left iliacus and iliopsoas tendon. There is extension of gas into the left thigh along the intermuscular and intramuscular planes.

region includes necrotising fasciitis, gas gangrene and gastrointestinal perforation.¹

OUTCOME AND FOLLOW-UP

Unfortunately the patient's clinical status did not improve. The decision was made for all active treatment to be withdrawn on postoperative day 2 after a discussion with her family members.

DISCUSSION

Retroperitoneal abscesses are insidious, occult illnesses which are marked by diagnostic delays and inadequate drainage. An appreciation of the condition and its associations should improve awareness, leading to earlier drainage and thus a reduction in patient mortality.

The retroperitoneum is a potential space with clearly defined boundaries between the peritoneum and transversalis fascia. It contains the kidneys, ureters, duodenum, pancreas and portions of the ascending and descending colon. The source of retroperitoneal infections is from such organs contained within, or from organs abutting the retroperitoneum. The most common source is from the kidney or renal tract.² Other causes include perforation secondary to neoplastic disease or diverticulitis, retrocaecal appendicitis, pancreatitis, biliary tract disease, peptic ulcer disease, inflammatory bowel disease and osteomyelitis of vertebral bodies.^{3–4} A retrospective review of 50 cases of retroperitoneal abscesses by Crepps *et al*⁵ revealed that the majority of patients had immunosuppressive conditions, such as diabetes, malignancy and chronic renal failure.

In our case report, the patient had a medical history of long-standing insulin-dependent diabetes and stage IV chronic renal disease. She also underwent a previous subtotal colectomy for colorectal cancer and a left nephrectomy due to severe pyelonephritis, 3–18 years prior to her illness. The CT scan revealed a large biloculated collection in the left renal fossa (figure 2), which may have acted as a dead space for potential bacterial growth. Of note, there was no evidence of malignant reoccurrence on the CT scan.

Elicited signs of peritonitis are possible if inflammatory processes are present within the intraperitoneal space. In contrast, the extraperitoneal region is relatively inaccessible to the hands of an examiner, and the tissues may demonstrate little inflammation to bacterial contamination. This leads to a lack of specific clinical signs when there is bacterial growth within the retroperitoneum. In one report of 22 cases of retroperitoneal abscesses less than half of the patients reported abdominal pain.⁶ This often leads to delay in diagnosis and a high mortality. In the retrospective review by Crepps *et al*⁵ it took an average of 12.7 days to establish a diagnosis. In suspected cases a thorough examination should be done to exclude tender masses in the abdomen, flank and more rarely in the thigh, groin or scrotum.

Our patient did not report any abdominal pain, and no abnormalities or signs of peritonitis were found during abdominal examination. The only abdominal symptom was a 3-day history of loose stools. In fact the main presenting symptom was a 4-week history of the left thigh pain. Most patients with retroperitoneal abscesses present non-specifically with malaise, fever, nausea and weight loss.⁷

Patients may present with extra-abdominal manifestations, for example referred pain to the hip or knee⁷ or painful inguinal swellings.⁸ In some cases these may be the only presenting symptoms. There have been various case reports describing abscesses in the retroperitoneum, which manifest distally in the thigh.^{9–14} The spread of retroperitoneal abscesses to the thigh owes itself to the anatomical configuration of the

retroperitoneum. The psoas muscle which courses through the retroperitoneum is enveloped by a strong endofascia, and injection studies have shown that the fascia confines collections within it.¹⁵ Indeed this may provide a pathway for extension of the process to the hip and thigh. In addition the compartment is closed superiorly by the diaphragm but is open inferiorly, allowing extension of abscesses to the pelvis and thigh.^{16 17} In one noteworthy case report the abscess extended to the hip joint resulting in osteomyelitis, which required a resection arthroplasty.¹⁰

As in our case the main manifestation was extra-abdominal, with extensive thigh emphysema, seen initially on the plain radiograph (figure 1). The CT scan showed air in the left psoas muscle with extension through the left iliacus and iliopsoas tendon, with gas present distally within the muscular planes of the left thigh (figure 3).

A CT scan with contrast provide imaging with the highest accuracy and efficiency.^{18–22} It provides information on the extent of involvement, and can assist in surgical planning. Abscesses can also be drained percutaneously, and there is some supporting evidence that this method is highly effective.^{23–25} In cases where there is severe sepsis surgery may be indicated over percutaneous drainage, as this is a more rapid method to remove the focus of infection.²⁶

On a literature review there are many cases of retroperitoneal abscesses associated with retrocaecal appendicitis.^{5–7 18 20 21 26} There are also quite a few case reports relating to intraperitoneal, retroperitoneal and psoas abscesses with presentations of thigh emphysema.^{9–14} Such case reports have similar courses, with insidious, atypical presentations.

In conclusion the formation of a retroperitoneal abscess, with involvement of the thigh, is a serious condition necessitating early diagnosis and prompt treatment. An emphasis must be made on the importance of suspecting occult infections in any unwell patient with conditions which may impair the host's immune response. Patients presenting with discomfort in the hip or thigh and painful groin swellings may indeed have a something more sinister intra-abdominally, despite a lack of obvious signs.

Learning points

- Retroperitoneal abscesses have insidious and unusual presentations, and if they are missed and treatment is delayed the condition is often fatal.
- CT scans are the modality of choice coupled with percutaneous or surgical drainage depending on the extent of involvement.
- Maintain a high index of clinical suspicion for occult intra-abdominal abscesses in any unwell patients with the aforementioned unusual extra-abdominal signs or symptoms.

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