Eikenella corrodens retroperitoneal necrotising fasciitis post-endoscopic retrograde cholangio-pancreatography

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Endoscopic retrograde cholangio-pancreatography (ERCP) is a common procedure for the removal of gallstones lodged in the biliary tract. Guidewires are often employed to reduce the risk of post-ERCP pancreatitis.1

This is the first reported case of a patient who developed retroperitoneal necrotising fasciitis as a result of a retained guidewire after ERCP. Fractured guidewires are a previously described rare complication of this common intervention.2 It appears the guidewire was retained post-procedure and perforated the duodenum. The dominant organism isolated was an oral organism with well-documented ability to form biofilm. It was most likely introduced from the mouth during the passage of scope.

Case

A 49-year-old man presented with a two-day history of abdominal pain and spreading cellulitis of the abdomen as well as the appearance of bruising down his right leg. Communication was limited as he did not speak any English and had only recently come to New Zealand. Notes retrieved from the GP indicated that he had first presented with severe right hip pain and no fever a week prior. The history that could be elucidated was that he had undergone an endoscopic procedure for gallstones five months ago in Malaysia. He had no other medical conditions.

Admission blood tests showed that he appeared to be acidotic with respiratory compensation. He was afebrile with a temperature of 36.1 degrees Celsius. He had mildly raised white cell count (12,800/uL), normal neutrophil count (5,200/uL), elevated CRP (17mg/dL) as well as acute impairment of his renal function (creatinine at 1.40mg/dL). Blood cultures taken at the time demonstrated no growth on culture after five days. The patient was started on intravenous cefuroxime and metronidazole as per hospital protocol for abdominal infections.

A CT scan showed a metallic foreign body 20cm in length extending from the common hepatic duct, through the common bile duct and perforating the duodenum and into the retroperitoneum (Figure 1). There was extensive fluid and gaseous collections retroperitoneally around the duodenum and in the right pararenal space (greater on the right that the left); within the layers of the abdominal wall between internal and external oblique muscles; in the right iliac fossa overlying the iliacus muscle; further extension into the pelvis to surround the bladder; and the right anterior thigh (Figure 2).

Surgical findings were that there was contamination within the abdomen with infected fluid. Pus was present between the various layers of the abdominal wall with associated separation and destruction of the layers. There was also dissection of the fascia lower down into the groin region. All these areas looked grossly infected. On the right anterior thigh there was an area of bluish pigmentation consistent with ischaemia. After the abdomen had been explored an ellipse of tissue was taken from the anterior thigh and all the tissue from skin, subcutaneous fat and muscle
Figure 1: A-C, serial coronal sections demonstrating trajectory of guidewire (indicated by arrows) originating from the common hepatic duct confluence, through the inferior duodenal wall at D2/D3, and into the right iliac fossa.

Figure 2: Coronal section demonstrating free air and fluid in the abdominal wall, pelvis and anterior right thigh.
was necrotic. There was a foul smelling discharge. Samples were sent for culture and microscopy.

After thorough exploration and assessment, it was deemed that this was not a survivable event. The decision was made to not proceed any further. The foreign body was not visualised and was therefore likely lodged retroperitoneally—removal would not have caused any improvement so was not pursued. The infection was so widespread that debridement was not feasible. His abdomen was closed and a dressing was applied to the anterior thigh. He was referred through to ICU for palliative management. Over the next 24 hours he continued to deteriorate and died during the following day. Subsequent microscopy of specimens confirmed a mixture of gram positive and negative bacteria, aerobic and anaerobic flora; Eikenella corrodens was isolated.

Discussion

The risk of serious complication following ERCP is less than 2% and includes pancreatitis; bleeding; cholecystitis; cholangitis; sepsis; perforation; myocardial infarction; death. Basket trapping has also been reported. Although rare, reports of fractured and retained guidewires have previously been described occurring due to excessive manipulation, extracorporeal shock wave lithotripsy, sphincterotomy formation and during formation of a pancreaticoduodenostomy tract. Wires usually remain in the hepatic ducts, duodenal wall or pancreatic duct. In most cases, patients are asymptomatic and have no long-term complications. Removal of retained wires has been previously achieved using balloon catheters, wire guided forceps and basket, or surgically via a Whipple’s procedure. One case of wire migration has been recently described where a patient presented with right leg and back pain two weeks after ERCP. A 26cm wire was seen on CT in the retroperitoneum along the right iliopsoas muscle extending into the vastus intermedius to penetrate the common and deep femoral veins. Extensive infection was not seen. In this case, the wire was removed by interventional radiology through a transjugular approach.

Eikenella corrodens is a gram-negative bacillus with biofilm capability, which colonises the oral cavity and is commonly associated with periodontal infections. It has also been implicated in infections of the skin, chest, abdomen, blood, heart, central nervous system, thyroid gland, extremities and bone. Eikenella corrodens has also been identified as a causative agent in another case of necrotising fasciitis, reported to have occurred after elective inguinal hernia repair. Despite the wide variety of sites of infection, infection usually originates from the oral cavity. Many E. corrodens infections of the hand are associated with bite marks. Previous case reports have demonstrated that it is typically resistant to cefuroxime and metronidazole as well as clindamycin. The majority of infections involving E. corrodens also tend to be polymicrobial, with the most common concurrent isolate being streptococci. In a previous review of 43 patients infected by E. corrodens, malignancy was the most common underlying condition.

Necrotising fasciitis is a soft tissue infection characterised by necrosis of the fascia and subcutaneous tissue. Management involves prompt resuscitation, initiation of antibiotics and aggressive debridement. Retroperitoneal necrotising fasciitis has been described secondary to appendicitis, pancreatitis, pelvic infection; diverticulitis; malignancy of the colon and post-partum. There has been one other case described post-ERCP. Diagnosis is difficult due to absence of clinical signs in the early state. Even in the absence of comorbidity, successful treatment is difficult due to the anatomical extent of disease and the difficulty in effectively debriding the retroperitoneum, as evident in the present case. Surgical intervention is required in most cases.

We conclude that a fractured guidewire was retained during the patient’s previous endoscopic procedure and subsequently migrated into the retroperitoneum. The organism was most likely introduced during passage of the endoscope through the oral cavity and entered the retroperitoneum through the duodenal perforation. The retained wire likely facilitated the direct inoculation of this oral pathogen into the retroperitoneum by providing a surface which allowed biofilm formation. Subsequent super-infection by gut organisms.
would have led to this clinically worsening condition. It is likely the infection spread initially from the retroperitoneum, through the layers of the abdominal wall, then into the soft tissues of the thighs. Biofilms are also known for their role in antibiotic tolerance.\(^7\) Biofilm capable bacteria are able to evade the immune response, enabling spread of infection. The mechanisms by which biofilms are able to attenuate host immunity inhibiting macrophage activity;\(^18\) inducing a fibrotic response;\(^19\) down-regulation of virulence factors; and physical protection of bacteria from the host immune response, allowing unimpeded spread of infection.\(^17\) This is the likely reason that he was afebrile with only mildly elevated inflammatory markers and white cells despite the extensive infection. Biofilms are also known for their role in antibiotic tolerance.\(^7\)

Despite efforts, we were not able to contact the foreign institution at which the original procedure was completed and so do not know if retention of this foreign body was recognised. This case highlights the aggressive nature and difficulty in treatment of device-related infection and the contribution to this by the ability of biofilm capability. This potentially fatal complication needs to be brought to the attention of gastroenterologists performing ERCP and confirms the importance of removing this device post-procedure.

**Competing interests:**
Nil.

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