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SHORT REPORT

Infective Abdominal Aortic Aneurysm due to Haemophilus Influenza Identified via the Polymerase Chain Reaction

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Abstract Infective abdominal aortic aneurysms due to Haemophilus influenza are rarely reported. We report a case in a 65 year old female presenting with abdominal pain, weight loss, pyrexia and elevated inflammatory markers. The patient was found to have an abdominal aortic aneurysm clinically and on CT scanning. At surgery, an inflammatory aneurysm was successfully repaired using an autogenous vein panel-graft. Tissue samples were analysed using the polymerase chain reaction, identifying H. influenza as the causative organism. H. influenza is a scarcely reported cause of infective aortic aneurysms. The mechanism of infection is unknown. Reference is made to existing reports of such infection.

Introduction

Infective or 'mycotic' processes are an uncommon cause of abdominal aortic aneurysms. Multiple organisms have been implicated, although Salmonella and Staphylococcal species predominate. Haemophilus influenza is a rare and scarcely reported pathogen involved in such aneurysms. We report a case of an infective abdominal aortic aneurysm in a 65 year old female due to H. influenza. The causative organism was identified post-operatively using the polymerase chain reaction.

Report

A 65 year old female attended with an 8 week history of central abdominal pain and weight loss of 6 kilograms. The patient was a smoker and had a history of treated hypertension and a non-myelomatous monoclonal gammopathy. The symptoms preceded a recent dental extraction. Examination demonstrated a tender expansile supra-umbilical mass. The presence of an abdominal aortic aneurysm prior to this episode is unknown. The patient was

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pyrexial, with an ESR of 119 mm/hr, neutrophil count of 11.6×10^9/l and albumin of 23 g/l. A contrast CT of the abdomen demonstrated a 45 mm abdominal aortic aneurysm at the level of the renal arteries with surrounding inflammatory appearances (Fig. 1). No iliac artery involvement was noted. Intravenous antibiotic treatment was commenced using vancomycin and ciprofloxacin to cover staphylococcal and salmonella species.

The patient underwent open repair of the aneurysm through a subcostal incision with medial visceral rotation of left kidney, left colon and spleen. Following sling control of the descending thoracic aorta at the level of the crura and the abdominal aorta infra-renally, aortic cross-clamps were applied at infra-coeliac and infra-renal (supra-superior mesenteric artery) levels. Proximally the aorta was transected obliquely below the coeliac trunk with the superior mesenteric artery and right renal artery preserved on a pedicle demonstrating an aortic false aneurysm of probable infective origin. Balloon occlusion of the right renal artery was achieved with a 5 Ch Fogarty catheter. Selective visceral clamping or perfusion was not used. Distally the aorta was divided approximately 3 cm distal to the left renal artery. The aneurysm and surrounding inflammatory tissue were debrided. The aorta was reconstituted using a panel graft fashioned from autogenous superficial femoral vein with re-implantation of the left renal artery. SMA and right renal artery perfusion was restored after 26 minutes and that of the left kidney after 60 minutes. During dissection, the pleura were opened bilaterally and so prior to closure bilateral pleural drains were inserted in addition to a left retro-renal drain. Blood loss was estimated at 900 mls. Red-cell salvage was not employed owing to a potentially infective operative field and the patient received a total 3 unit red-cell transfusion. The patient was extubated uneventfully 16 hours post-operatively and suffered no significant complications. Renal function was preserved.

Histologically, the resected specimen confirmed patchy active inflammatory foci with interspersed atheromatous debris and necrotic matter. Histochemical staining did not show a specific causative agent. Additionally, blood cultures taken prior to commencing antibiotic therapy and cultures of segments of the aneurysmal sac were negative. To identify the causative agent and tailor post-operative antibiotic therapy, sac material was analysed using the polymerase chain reaction technique (PCR). This demonstrated Haemophilus influenza as the probable culprit organism. Capsule-based serotyping was not possible as the technique amplifies ribosomal DNA. The antibiotic therapy was then rationalized to oral ciprofloxacin only. After an uncomplicated recovery, the patient was discharged well on post-operative day 13 to complete a 28 day course of antibiotics. Clinical review, inflammatory markers and repeat CT imaging 28 days post-operatively revealed no evidence of persisting infection.

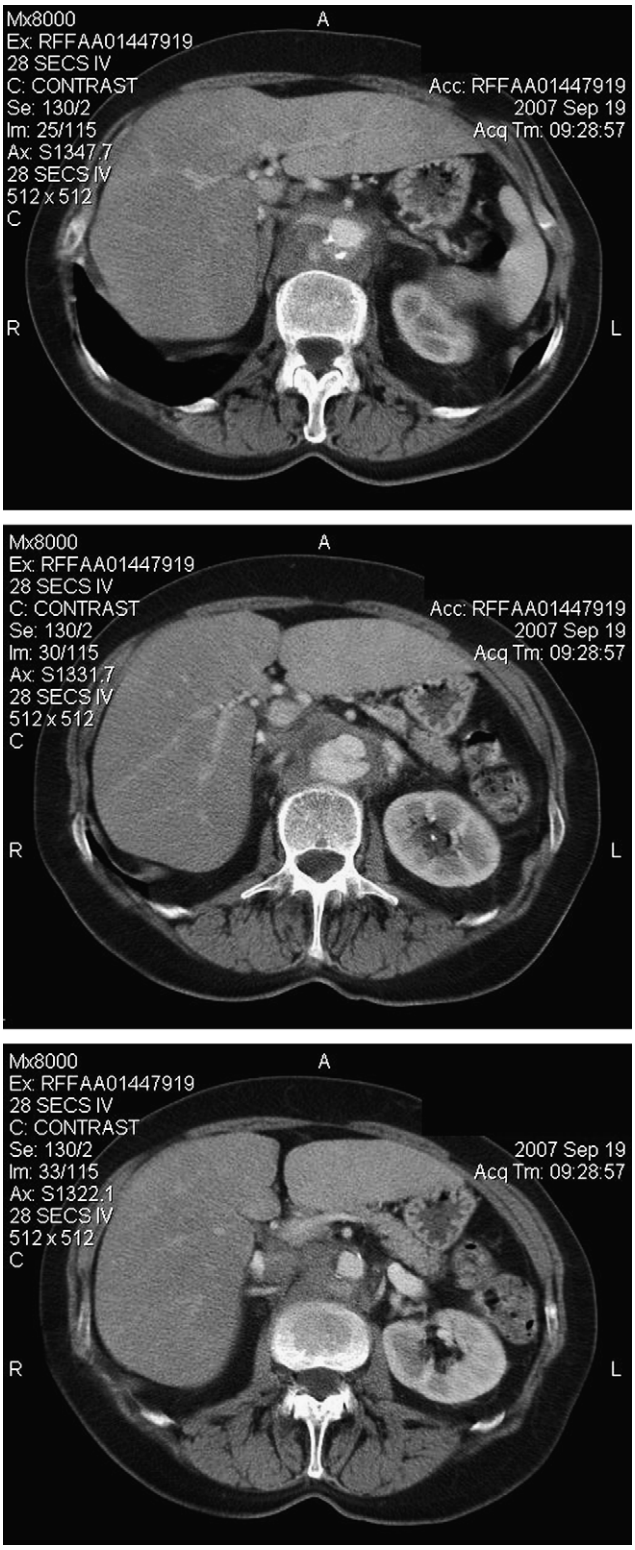

Figure 1 CT appearances of infective abdominal aortic aneurysm due to H. influenza.

Discussion

Infective agents are an uncommon cause of abdominal aortic aneurysms and most reports comprise case-series of limited numbers. Salmonella and Staphylococcal species account for the majority of cases, although Streptococcal, Bacteroides and Clostridia species have also been implicated.[1] There is a declining rate due to syphilitic infection. H. influenza is a rarely reported causative agent, with

a limited number of isolated case reports.[2–5] H. influenza is a gram-negative bacillus and may be capsulated or non-capsulated. Capsulation confers increased virulence — such strains, particularly serotype b, are an important cause of invasive infection in children. Adult infection is less common and aortitis and subsequent aneurysm formation extremely rare. The mechanism of infection is not known — an atheromatous lesion may act as a nidus permitting seeding secondary to a bacteraemia with subsequent aortitis and aneurysm formation although this is unproven. PCR may be used to isolate the organism in the event of negative conventional cultures. The technique amplifies the ribosomal DNA of bacterial species precluding specific serotyping. PCR produces a qualitative assessment organisms present in the sampled material and in this respect can not prove that the organism is responsible for the infective process. However, in the absence of additional confounding microbiological evidence, this positive PCR result was used to apply more focussed post-operative antimicrobial therapy.

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