Disseminated Mycobacterium chimaera infection involving the aortic vascular graft due to a healthcare-associated source presenting early after index surgery with haemopthysis

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Background

A prolonged outbreak of healthcare-associated (HA) infections related to heart surgery with *Mycobacterium chimaera* (*M.chimaera*) has been reported in 4 European hospitals. Contaminated heater-cooler units used during cardiac surgery were identified as source of infection. Two adult cases involving aortic grafts have been reported, both died due to uncontrolled infection. Here we present another case of *M.chimaera* aortic vascular graft infection. Unlike previous cases, this patient presented early at 6 months after index surgery with haemopthysis being the initial complaint and from a not previously affected hospital.

Methods

A 71 year-old immunocompetent white male presented with intermittent haemopthysis, dry cough, mild shortness of breath and fever 7 months after implantation of an aortic vascular graft for Type A aortic dissection. Pertinent past medical history included chronic renal insufficiency and a slowly progressing neuroendocrine tumor with hepatic metastases. Laboratory findings on presentation: see Table 1. Computertomography (CT) scans showed bilateral pilmonary infiltrates. (Fig 1) Bacterial and mycobacterial stains of sputum and bronchoalveolar fluid (BAF) were negative as were bacterial cultures. There was no response to sufficient courses of antibiotics. Mycobacterial respiratory cultures grew *M.chimaera* (sputum day 24, BAF day 28), suggesting the diagnosis of *M.chimaera* pneumonitis. During the course the patient continued to have recurrent haemopthysis and developed a *Nervus laryngeus recurrens* paresis, likely secondary to progressive endoleaks of the aortic graft and a periprosthetic fluid collection as shown on consecutive CT scans. (Fig 2) Endovascular prolongation and overstenting of the thoracal vascular graft was performed. The periprosthetic fluid collection (PFC) grew *M.chimaera* as did mycobacterial blood cultures (MBC) obtained prior to treatment initiation. (Fig 3, Fig 4) Combination therapy with Clarithromycin (2x0,5g), Rifabutin (1x0,3g), Ethambutol (1x1,6g), Levofloxacin (1x0,75g) and Amikacin (1x1g) was initiated. Amikacin was stopped on day 14. Subsequent mycobacterial blood cultures obtained 2 and 4 months after treatment initiation were negative. The patient passed away due to the underlying malignancy 5 months after the start of antimycobacterial treatment. There was no clinical evidence of uncontrolled infection as evidenced by sterile blood cultures one month prior to death.

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Date	T (°C)	Lc /µl	Ly /µl	Tc /µl	CRP mg/dl	eGFR ml/min	Antibiotic therapy	Microbiology	Event
Dec. 2014									Index surgery
25.07.2015	38,3	12,5	1,04	264		29		3/3 Sputum: AFB Stain neg, culture: *M.chimaera*	Haemopthysis CT Thorax (Fig 1)
19.08.2015	38,8	9,7	1,8	225	35			BAF: AFB Stain neg, BAF culture: *M.chimaera*, MBC: sterile	Haemopthysis CT Thorax (Fig 2)
09.09.2015	afeb	6,5	0,53	218	68	28	Clarithromycin, Ethambutol, Rifabutin, Levofloxacin, Amikacin	BAF: AFB Stain neg, BAF culture: *M.chimaera*, MBC: *M.chimaera*	Endovascular implantation of thoracal aortic stent
11.09.2015	afeb	6,5		126		25	x	PFC: *M.chimaera*, MBC: sterile	CT-guided drainage of PFC, Ophthalmological exam: no emboli, no chorioiditis
23.09.2015	afeb	12,3		90		20	Amikacin STOP		nephrotoxicity
10.11.2015	afeb	5,89		78		16	x	MBC: sterile	
08.01.2016	afeb					30	x	MBC: sterile	
17.02.2016		12,6		112		28	x		death

Table 1: Clinical course, diagnostic results and treatment of *M.chimaera* infection. AFB (acid fast bacilli).

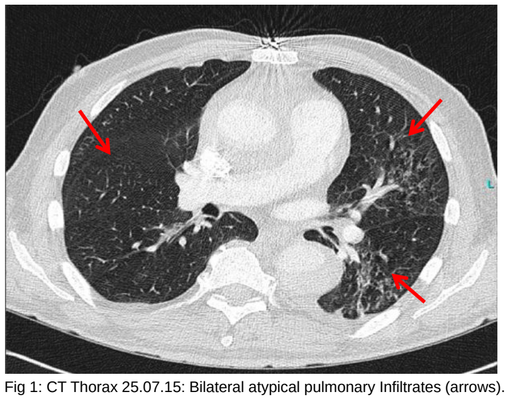


Fig 1: CT Thorax 25.07.15: Bilateral atypical pulmonary Infiltrates (arrows).

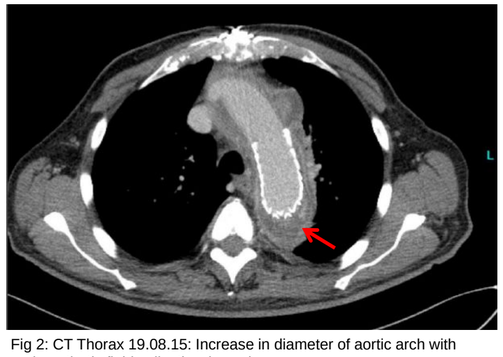
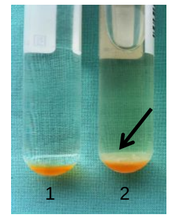


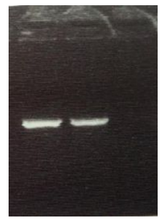
Fig 2: CT Thorax 19.08.15: Increase in diameter of aortic arch with periprosthetic fluid collection (arrow).

Fig 3:



Tube 1: control,
Tube 2: inoculated with periprosthetic fluid, growth of *M.chimaera* (arrow).

Fig 4:



Gel electrophoresis 16S Mycobacteria rDNA PCR
1: patient probe (1:10)
2: positive control
3: negative control

Results

To our knowledge we report the third case of presumed HA-*M.chimaera* aortic vascular graft infection (PUBMED search). Infection became apparent early at 7 months after index surgery, compared to the previously reported duration of 17 and 21 months. Though our patient showed pronounced lymphopenia and CRP elevation on presentation, there was no anaemia, thrombocytopenia, elevated transaminases, splenomegaly or eye pathology as seen in the prior 2 cases, probably related to early presentation. Like in our case, pneumonitis was diagnosed in one prior case and blood cultures were reported positive in one case. While fever was present in all previous cases, shortness of breath was reported in one patient. Our case is the first where haemopthysis and *Nervus laryngeus recurrens* paresis were present, likely secondary to endoleaks caused by *M.chimaera* graft infection.

Conclusions

HA-*M.chimaera* aortic vascular graft infection may become symptomatic early after index surgery. Haemopthysis and pneumonitis can be the presenting symptoms, calling for a high index of suspicion in patients with the appropriate history. Prompt initiation of treatment may improve survival

Disclosures none

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