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Short communication

Case report

First *Robinsoniella peoriensis* aortic cross homograft mycotic pseudoaneurysm: A case report and review of the literature

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ABSTRACT

Mycotic aortic aneurysm is a rare and challenging complication of aortic homografts caused by an infection and is associated with high morbidity and mortality.
We report the first case of an aortic cross homograft mycotic pseudoaneurysm caused by *Robinsoniella peoriensis* in a 70-year-old man. Our patient underwent surgery for a recurrence of aortic cross mycotic pseudoaneurysm at the level of the aortic homograft he had had 7 years before. A clot-removal of the pseudoaneurysm was surgically carried out and the homograft was completely removed. Anaerobic culture from tissue samples yielded pure growth of a spore-forming Gram-positive rod, identified later as *Robinsoniella peoriensis* by 16S rRNA gene sequencing. The patient was then discharged with oral clindamycin according to the *in vitro* susceptibility testing.
Identification of *R. peoriensis* might be challenging in clinical laboratories with no access to molecular methods.

1. Case presentation

A 70-year-old man was admitted in the cardiovascular surgery unit for the surgical management of an aortic cross mycotic pseudoaneurysm highlighted during an assessment for a low-grade fever (37,5–37,8 °C) persistent for 14 days. Twenty-two days before hospitalization, an outpatient transesophageal echocardiography revealed an aneurysmal dilatation of the aortic cross with a periaortic infiltration. A fluorodeoxyglucose-F18 positron emission tomography combined with a computed tomography (FDG-PET/CT) showed an intense focal FDG uptake (SUVmax: 8.2) into the aortic cross pseudoaneurysm wall and multiple mediastinal adenopathy around the pseudoaneurysm (SUVmax 7.9) (Figure 1). There were no aorto-esophageal nor aorto-bronchial fistulization. Upon admission, the clinical examination was without peculiarity. Laboratory investigations revealed a normal leukocyte count (5800 cells/mm^3) and a moderate elevated C-reactive protein (CRP) at 12 mg/L (normal value < 5 mg/L). Three pairs of blood cultures (including aerobic and anaerobic conditions) were taken and remained sterile after five days of incubation. Seven years before this admission, the patient suffered from an aortic cross pseudoaneurysm with no history of positive microbiological cultures and he underwent a aneurysmectomy with the replacement of the aortic arch by a homograft.

The actual surgical intervention consisted of the complete excision of the homograft, debridement of the infected tissues, clot-removal of the pseudoaneurysm and an in-situ reconstruction with a new cryopreserved homograft. Tissues from the clot and the excised homograft were sent for further bacteriological investigations. The patient was given empirically intravenous ceftazidime (2g every 8h) and vancomycin (15 mg/kg every 12h) just after the surgery. The tissue and pus Gram-staining revealed the presence of polymorphonuclears and Gram-positive coccobacillus. Three days after the surgery, the culture obtained from the clot and the removed homograft evidenced pure growth of bacteria only on the anaerobic agar media. All the identifications using Matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF-MS, Microflex Bruker Daltonics, Germany) failed with a direct method, and after extraction according to manufacturer recommendations (IVD MALDI Biotyper V2.3 software). Identification was carried out 19 days later by 16S rRNA gene sequencing using SQ1-S (5′-AgAgTTTgATCCTggCTCAg-3′), SQ1-AS (5′-AAggAGGTgATCCARCCgCA-3′), SQ2-AS (5'-gggTTgCgCTCgTTG-3′) and SQ3-AS 5′-TCTACgCATTTCACCgCTAC-3 primers.

(96GA3730 XL, Applied Biosystem, USA). The results revealed the presence of *Robinsoniella peoriensis* with 100% of identity. On day 9, antimicrobial susceptibility testing was performed from positive cultures (without any identification) by E-test strip method revealed the following results: a minimum inhibitory concentration (MIC) for amoxicillin-clavulanic acid, clindamycin, meropenem and metronidazole of 0,5 mg/L, 2 mg/L, 0.125 mg/L and 0.125 mg/L respectively. The antibiotherapy was then switched to ceftriaxone (2g every 24h) and metronidazole (500 mg every 8h) according to these results. Noteworthy blood cultures taken before the surgery remained sterile.

On day 15, the patient felt better and the inflammatory markers improved. He was therefore discharged on oral clindamycin

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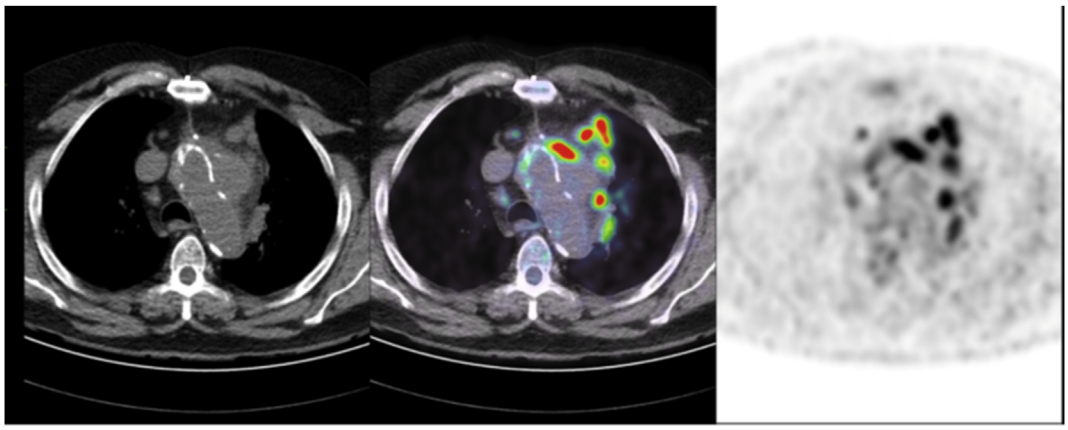

Fig. 1. Coronal and axial view of fused FDG-PET/CT showing increased FDG uptake at the level of the thoracic aortic cross pseudoaneurysm wall (SUVmax : 8.2) and multiple mediastinal adenopathies (SUVmax : 7.9).

treatment (600 mg every 8h).

On day 44, he was seen at the outpatient consultation: he was in an asymptomatic state, with normal WBC value and normal CRP.

2. Discussion

Mycotic aortic aneurysm is a term first used by Osler in 1885 to describe infected mushroom-shaped aneurysm associated initially with endocarditis. Nowadays, it is used for all infected aneurysm of the aorta and is not restricted to fungal microorganisms. It is a rare disease representing 0.7–2.6% of all aortic aneurysm. The mean age of presentation is 65 years and men are more often concerned than woman (ratio 3:1) [1]. They are mainly located in the abdominal space, aortic thoracic aneurysm remaining rare. When localized in the aortic arch, they are invariably fatal if not treated [2].

The preferred surgical technique is actually the debridement of the infected tissues and the in-situ replacement using a prosthetic graft or a homograft [3]. Cryopreserved homografts have the advantage to be resistant to most microorganisms and to allow a better antibiotic diffusion into their wall [4].

With the arrival of these surgical methods, aortic prosthetic vascular graft infections (PVGI) have become progressively a big concern with an infection rate of 1–6% of patients who benefited from an aortic prosthetic graft and a mortality rate of 75% [3].

The most common causative agents of thoracic PVGI are Gram-positive cocci, especially *Staphylococcus aureus* and coagulase-negative Staphylococci, whose prevalence can reach 75% in this setting [5,6]. Anaerobe PVGI are rare and they are mainly encountered in the abdominal space, often involved in polymicrobial infections. The most common anaerobes identified are *Bacteroides fragilis* [7] and *Clostridium* spp. The latter has also been described in aortitis associated with colon cancer [8]. *Peptostreptococcus* and *Fusobacterium* are even less frequently reported [9].

In the literature, only few cases of thoracic PVGI are reported. In the retrospective study of Erb and all 8.3% of 24 thoracic PVGI were caused by anaerobes (without specifying the type of anaerobes) whereas *Propionibacterium acnes*, an aerotolerant anaerobe of the skin, was noted in 20.8% of the cases [5].

In opposite to PVGI, little is known about aortic homograft infections, which seem to be really rare. Vardanian and all [10] reported one case of pseudoaneurysm with reinfection in an abdominal aortic homograft. To our knowledge, there has been no anaerobe infection of a thoracic homograft reported to date.

Robinsoniella peoriensis is an anaerobic Gram-positive, spore-forming, ovoid to short bacillus found as single or in pairs, which was classified as a novel species in 2009 [11]. Most *R. peoriensis* strains have been isolated from environmental sources and pig feces. As *R. peoriensis* was isolated from swine manure, it is possible that it could also colonize the gastrointestinal tracts of other

Table 1
Cases reported of *R. peoriensis* infections.

Patient	Sex	Age	Year	Country	Underlying disease	Specimen	Identification of the microorganism	Acquisition	Reference
Case 1	F	79	2009	Sweden	Not reported	Deep heel wound	Not reported	Not reported	[11]
Case 2	M	42	2010	China	Pancreatic cancer	Blood	16S rRNA gene sequencing	HA	[12]
Case 3	M	50	2010	Spain	Alcoholic liver Cirrhosis	Deep muscle Hematoma	16S rRNA gene sequencing	CA	[15]
Case 4	F	79	2011	USA	Cerebrovascular accident	Blood	16S rRNA gene sequencing	HA	[13]
Case 5	F	68	2011	USA	Open pelvic and femur fracture	Surgical wound debridement	16S rRNA gene sequencing	CA	[13]
Case 6	F	61	2011	USA	Left colectomy due to diverticulitis	Abdominal fluid collection	16S rRNA gene sequencing	HA	[13]
Case 7	M	45	2011	USA	Tibial and fibular fracture, internal fixation	Surgical wound drainage	16S rRNA gene sequencing	CA	[13]
Case 8	M	76	2012	Korea	Aspiration pneumonia	Blood	16S rRNA (post-mortem)	HA	[16]
Case 9	F	45	2012	France	Orthopedic thoracolumbar scoliosis device infection	Surgical wound drainage	16S rRNA sequencing	HA	[17]
Case 10	F	74	2015	Germany	Periprosthetic hip infection	Surgical wound drainage	16S rRNA	HA	[18]
Case 11	M	70	2016	Belgium	Mycotic pseudoaneurysm of an aortic arch homograft	Surgical periprosthetic tissue samples	16S rRNA gene sequencing	CA	Present report

CA: community acquired, HA: hospital acquired.