Pseudomonas aeruginosa endocarditis of a bioprosthetic aortic valve associated with sigmoid adenocarcinoma in a Non-IVDU Patient

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ABSTRACT

Endocarditis with atypical organisms poses a diagnostic and therapeutic challenge to physicians despite medical and surgical advances. Pseudomonas aeruginosa endocarditis is rare, especially in the absence of intravenous drug use (IVDU). Here, we present a case of non-IVDU, prosthetic aortic valve P. aeruginosa endocarditis associated with sigmoid carcinoma.

A seventy five year old gentleman with a bioprosthetic aortic valve presented with pyrexia on and off for six months and a 6 month history of weight loss. Three sets of blood cultures grew Pseudomonas aeruginosa. A CT scan was done to find the source of the infection and showed a partially obstructive lesion of the sigmoid colon which was later biopsied and found to be moderately differentiated adenocarcinoma. A Trans-oesophageal echocardiogram (TOE) showed a large 2.7cm mobile mass attached to all three leaflets of the aortic valve. He was started on Augmentin initially and then changed to tazocin and ciprofloxacin. Gentamicin was added in later and the tazocin changed to meropenem.

He continued to spike. One month post admission he had a redo aortic valve replacement to a tertiary care center. Despite his redo surgery he continued to spike and continued to grow Pseudomonas aeruginosa from his blood cultures. He passed away three months post-admission after deteriorating further.

Key words: p. aeruginosa, endocarditis, prosthetic valve.
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20 cm, confirmed moderately differentiated adenocarcinoma.

A trans-thoracic echocardiogram twenty one days after admission showed mild concentric left ventricular hypertrophy, good biventricular systolic function, no significant regurgitation, and his biological aortic valve replacement appeared well seated.

He was transferred to a tertiary centre, three weeks after admission, where a 2D and 3D TOE showed that his bioprosthetic aortic prosthesis had severely thickened leaflets, with a large 2.7cm mobile mass attached to all three leaflets of the aortic valve, prolapsing from the left ventricular outflow tract into the aorta. There was no evidence of aortic regurgitation or abscess.

A redo aortic valve replacement (AVR) was carried out because of non-response to antibiotics, one week after admission to the tertiary care center without immediate complications. One blood culture immediately post-op grew Pseudomonas, however, further bottles did not show any growth. Biopsy of the valve confirmed P. aeruginosa. Post-operative he was treated with Colistin and ciprofloxacin and had progressive recovery, with resolution of sepsis.

He was transferred back to Darent Valley Hospital for intensive rehabilitation awaiting a colectomy one month after being transferred to the tertiary care center.

Four weeks post-reo AVR he started spiking. He developed Pseudomonas septicaemia confirmed on four separate blood cultures which were done at intervals of two days each. He deteriorated despite being started on IV Tobramycin, ciprofloxacin, metronidazole, rifampicin and Colisitin which were continued for three weeks. A CT confirmed he had a localised perforation secondary to sigmoid cancer. He passed away three months after presentation.

Pseudomonas endocarditis was first noted in 1899, as described by Reyes et al. Most cases (95%) are associated with IV drug use and tend to be right-sided lesions. Left-sided P. aeruginosa is rare with few literature evidence. Furthermore, in a prospective study of 702 IE cases, only 4 were Pseudomonas endocarditis.

Bioprosthetic valves are more commonly associated with endocarditis than mechanical valves. Of interest, all four of (4) cases of PVE had a history of instrumentation. In our patient, it is consistent with previous findings that he developed endocarditis post-procedure.

Pseudomonas endocarditis is commonly reported as a nosocomial infection, secondary to catheters, di-alysis or RTI in non-IVDU patients. However, in our case, the association was with sigmoid carcinoma. Endocarditis was first documented as a complication of colon carcinoma in 1951. This has sparked a growing interest between the association of Strep-tooccus gallolyticus and colon carcinoma. However the commonest association is between bowel cancer and S Bovis endocarditis. To the authors knowledge, this is the first reported case of Pseudomonas endocarditis associated with colon cancer. Diabetes is an independent predictor for the development of endocarditis, irrespective of valvular abnormalities. Diabetic endocarditis patients have a significantly higher mortality rate.

DISCUSSION

P. aeruginosa is an opportunistic gram-negative aerobic rod, which can affect both native and prosthetic, left and right-sided heart valves. Of relevance to our case, P. aeruginosa shows a preference for prosthetic valves.

Figure 1, TOE image showing aortic valve vegetation

The prognosis for Pseudomonas endocarditis is poor, with as high as 80% mortality rate. This is hypothesised to be partly due to resistance to beta-lactams and aminoglycosides. The growth of P. aeruginosa from blood cultures normally takes between 48 and 98 hours of incubation. Hence, the diagnosis of the causative organism for septicaemia if often delayed. Fluroquinolones may be potentially promising.
in the event of resistance.\textsuperscript{15}

Left-sided endocarditis also carries a poor prognosis due to the potential for rapid and serious complications, including congestive cardiac failure, ring and annular abscess, and embolic events.\textsuperscript{4,15} The availability of oxygen in left sided lesions is hypothesized to be one reason that left sided lesions respond more poorly than right lesion to treatment in Pseudomonas infective endocarditis.\textsuperscript{4} found that despite adequate medical or medical and surgical therapy, three of four non-IVDU Pseudomonas endocarditis patients passed away, all suffering from persistent or recurrent bacteraemia. The authors noted that persistent P. aeruginosa bacteraemia in patients with a history of instrumentation should rouse the suspicion of endocarditis. Indeed, a low clinical index of suspicion is required for investigation of endocarditis in patients with prosthetic valves, who present with repeated positive blood cultures.

**CONCLUSION**

Infective endocarditis due to atypical organisms such as P. aeruginosa poses a diagnostic challenge and a significant risk to the patient. Persistent bacteremia in a patient with a prosthetic valve, warrants further investigations. Of note, in this patient the presence of moderately differentiated adenocarcinoma, which was newly diagnosed during his hospital stay, suggested that this bowel cancer could be a possible source of the endocarditis. Further observational studies would need to be carried out for clarification of the latter.

**REFERENCES**