Mitral stenosis produced by infective endocarditis involving a previously anatomically normal valve

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ABSTRACT

Described herein is a 63-year-old man who developed methicillin-sensitive *Staphylococcus aureus* endocarditis on a previously anatomically normal mitral valve. The resulting vegetations were so large that severe mitral stenosis resulted. The development of valve stenosis due exclusively to infective endocarditis is extremely rare.

KEYWORDS Cerebral emboli; infective endocarditis; mitral stenosis; mitral valve replacement

Infective endocarditis (IE) most commonly attacks a previously anatomically normal valve or one previously mildly deformed (e.g., bicuspid aortic valve, mitral valve prolapse) but one functioning normally or causing only mild regurgitation.^{1–3} In this scenario, the superimposed IE usually causes some regurgitation or worsens that already present. IE superimposed on a previously stenotic valve is uncommon. The vegetations of IE may cause no dysfunction or, if they do, the result is usually pure regurgitation.² IE by itself causing valvular stenosis is rare.^{4–8} Such was the case, however, in the patient described herein.

CASE DESCRIPTION

A 63-year-old man was known to have systemic hypertension, diabetes mellitus, chronic obstructive pulmonary disease, abdominal aortic aneurysm (3.5 cm), and obesity (body mass index 33 kg/m²). At the age of 54 years, chest pain prompted percutaneous coronary intervention, which was repeated in 2017. In early September 2018, he underwent left leg femoral artery angioplasty. Several days later, he noticed a lump in the left groin, the insertion site for his peripheral arterial procedure, followed shortly by fever, nausea, vomiting, and hypotension prompting admission to Baylor University Medical Center. Culture of the groin “lump” grew methicillin-sensitive *Staphylococcus aureus*, and he was treated with nafcillin. There was no precordial murmur. The

lungs were clear to auscultation. Echocardiogram 2 days after hospitalization disclosed a mass in the mitral orifice attached to the mitral leaflets, causing an estimated 8 mm Hg mean transvalvular gradient (*Figure 1*). Repeat echocardiogram 20 days later showed the mitral mass had increased in size, and the estimated mean transmitted gradient had increased to 14 mm Hg (*Figure 1*).

Mitral valve replacement was performed 2 days after the last echocardiogram. The large intramitral mass was excised as well as debris in the mitral annular area (ring abscess) (*Figure 2*). Because of ring abscess just caudal to the aortic valve, its three cusps, each devoid of vegetation, were also excised. His postoperative course was uneventful, and he was asymptomatic when contacted a year after the cardiac valve operation.

DISCUSSION

The first report describing valvular stenosis produced by a large vegetation appeared in 1967.⁴ Subsequently, several additional cases of valvular stenosis produced by IE on previously nonstenotic cardiac valves have been reported.^{5–8} As in all prior reports, the cause of the mitral stenosis in our patient was due entirely to the large vegetation obstructing mitral inflow into the left ventricle.

Relatively little data is available on the relation of vegetation size to outcome. Leitman and colleagues⁹ described 50

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Figure 1. Four-chamber views from (a) initial study and (b) 1 month later. Mitral annular calcium (arrows) is present on the initial study, with no evidence of endocarditis. A large vegetation (large arrow) is seen 1 month later. (c) Continuous wave Doppler of mitral inflow showing a mean gradient of 6 mm Hg on initial study, (d) which increased to 14 mm Hg due to obstruction from the large vegetation.

patients with IE involving native mitral valves and 34 involving native aortic valves. Although the reasons are not entirely clear, vegetations ≥ 1 cm, type of causative microorganism (specifically *Staphylococcus* sp.), and age >60 years appeared to worsen prognosis (increased need for operation and increased mortality).

Relatively little information also is available on the relation of vegetation size to antibiotic(s) used to treat the IE. Rohmann and colleagues¹⁰ studied 183 patients with IE by transesophageal echocardiogram and found vegetations on the native mitral valve alone in 89, on the aortic valve alone in 134, and on both valves in 40. The patients were followed from 2 to 186 weeks (mean 76). The initial vegetation size (8.4 ± 1.3 mm) fell with antibiotic therapy (to 7.8 ± 1.4 mm) in the group in whom an organism was isolated. Late follow-up (30 weeks) showed considerable further loss of vegetation size or total loss of the vegetation. The authors found that different antibiotics had different effects on vegetation size: vancomycin-associated treatment was related to a 45% reduction, penicillin-resistant drugs to a 15% increase, and cephalosporin to a 40% increase in vegetation size. None of

the patients described by Leitman et al or by Rohmann et al appeared to have developed valvular stenosis.

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Figure 2. Photographs of the entire operatively excised mitral valve (top) and close-up of the vegetation obstructing the mitral orifice. Scattered microorganisms, foci of polymorphonuclear and mononuclear cells, large collections of fibrin, and a few small calcific fragments were present histologically in the large vegetation.

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