Brief report

Coronary stent bacterial infection with multiple organ septic emboli

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Abstract

We describe an 80-year-old patient who developed \textit{Staphylococcus aureus} septicemia several days after the implantation of a double stent in the proximal and mid-left anterior descending artery. The infection was complicated by multiple abscesses in the lungs and liver, as well as by bilateral bacterial endophthalmitis requiring right vitrectomy. Long-term antibiotic treatment was successful. Rarity notwithstanding, heightened awareness of this potential complication of a common cardiac procedure is important since diagnosis and immediate therapy are mandatory.

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1. Introduction

Coronary artery stents are inserted today in about 70–80\% of all percutaneous transluminal coronary angioplasties (PTCA). Infection is a potential complication since a stent is a foreign body for the coronary system. Despite millions of stenting procedures, however, there are few reports of infected stents. We describe such a case.

2. Case report

An 80-year-old man with a history of atherosclerosis, myocardial infarction, and congestive heart failure was admitted for evaluation of chest pain. The physical examination and the laboratory profile were unremarkable. An electrocardiogram showed a complete left bundle branch block. The patient was diagnosed as having unstable angina and underwent coronary angiography revealing 85\% stenosis in the proximal segment of the left anterior descending artery (LAD) and 90\% stenosis in the middle LAD. Both LAD stenoses were dilated, and two stents (Jostent heparin-coated 3/16 mm, “Jomed”, Rangendingen, Germany) were successfully inserted. The immediate result and the post-procedural course were satisfactory and uneventful. The patient was discharged the following day.

One week later, he was readmitted with a 2-day history of fever (39.8°C) and chills. Physical examination and chest X-ray were normal, and the ECG pattern was unchanged. The erythrocyte sedimentation rate was 100 mm/1 h, C-reactive protein (CRP) 266 mg/l (normal range 0–5 mg/l), hemoglobin 11.0 g/dl, and lactic dehydrogenase (LDH) 445 u/l (normal <240 u/l). The remaining routine laboratory tests were normal. Three different blood cultures grew \textit{Staphylococcus aureus}, and intravenous (I.V.) cloxacillin 3 g×4/day was initiated. An extensive investigation, including physical examination, chest, abdominal, and pelvic computed tomography (CT), and ultrasound (US), as well as a radionuclide bone scanning examination, failed to detect any primary site as the possible source of the infection. Transesophageal echocardiography (TEE) was not consistent with the diagnosis of infective endocarditis, but imaging studies detected multiple abscesses in the lungs and liver.
One week after admission, the patient complained of impaired vision and an ophthalmologic examination revealed a severe bilateral bacterial endophthalmitis requiring emergent right vitrectomy.

Having essentially ruled out other sources for the S. aureus infection, we suspected a stent infection. Cardiac-gated CT angiography of the heart showed a small, soft tissue density collection adjacent to the distal end of the LAD stent, consistent with the clinical diagnosis of coronary stent infection (Fig. 1). The patient was offered surgical removal of the stent and coronary artery bypass grafting (CABG), but refused.

After 1 week of I.V. cloxacillin, the patient became afebrile, and a week later, his general condition was excellent. He was asymptomatic and had an improved laboratory profile and negative blood cultures. I.V. cloxacillin was continued for a total of 6 weeks and the patient had a full clinical and laboratory recovery.

3. Discussion

After more than 20 years of coronary angioplasty [1] and more than a decade of stent insertion [2] to prevent vessel closure and late restenosis, this combination has become a routine procedure. Since a stent is a foreign body, it would not be unreasonable to anticipate potential infections. Surprisingly, a literature search revealed only six such case reports [3,4].

Some authors have proposed that the low infection rate of coronary artery stents may be a result of the inflammatory nature of atherosclerosis, which may provide a protective effect. Baddour et al. [5] suggested that endothelialization of the stent struts may be important in preventing infection. In a retrospective analysis, only 7 of 210 patients with coronary stents had bacteremia and none had evidence of coronary artery stent infection [6]. Factors that were associated with bacteremia included arterial sheaths left in up to 2 days and local complications at the site of arterial puncture (persistent oozing, hematoma, pseudoaneurysm formation).

From the six case reports, including ours, it appears that a stent infection may develop a few days to a few weeks following insertion of the device. The clinical picture may resemble a systemic bacterial infection or it may be more specific with localized symptoms, such as chest pain or dyspnea, resulting from stent infection and coronary restenosis. A causative agent was identified in all seven patients: S. aureus in five and Pseudomonas aeruginosa in two. Cardiac imaging, including TEE, CT, and MRI, as well as coronary angiography may help in the diagnosis, along with the exclusion of other systemic infections.

A stent infection can be localized to the coronary artery and the surrounding tissue, as had been described in the six previously reported patients, but it may also be more diffuse, as in our patient. His case shows that metastatic multiple abscesses comprise a potentially devastating complication of this bacterial infection. The emergent right vitrectomy saved our patient’s vision, emphasizing the importance of prompt diagnosis and treatment.

An optimal therapeutic approach has not yet been established. Four patients were treated with a combined surgical and medical approach, and only two survived. The other three patients were treated conservatively with I.V. antibiotics and two, including ours, survived. The small number of affected patients and our limited experience preclude drawing definitive conclusions regarding prognosis: it is conceivable that this is a potentially lethal bacterial infection, even if it is localized.

Based on the cases reported, we recommend that, after blood cultures and until the causative agent is identified, treatment with anti-S. aureus and anti-P. aeruginosa antibiotics be initiated in any case of suspected coronary stent infection.

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References


