

## Coronary Stent Restenosis in a Patient with Sepsis Caused by *Pseudomonas Aeruginosa*. Case Report

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### ABSTRACT

Coronary artery disease is a major global health problem, leading to the accumulation of atheromatous plaque within the tunica intima of the coronary artery, limiting blood perfusion throughout the heart. To restore normal blood flow within the coronary artery, the coronary artery is expanded using a balloon-tipped catheter and a stent is placed. Drug-eluting coronary stents are the most effective option in percutaneous coronary intervention while reducing restenosis. However, the implantation of a stent can cause other complications such as infection and thrombosis. The case of a 51-year-old man is presented, who presents a picture of oppressive chest pain intensity 10/10, radiating to the neck and left scapula, an electrocardiogram with ST-segment depression in V3-V6 is performed, coronary angiography is performed with coronary artery disease of multiple vessels, stent restenosis of the circumflex and anterior descending artery, with chronic total occlusion of the right coronary artery, saccular aneurysm of the anterior descending artery. At 3 weeks he presented fever spikes and new very high-risk angina events due to dynamic electrocardiographic changes in the anterolateral face, for which blood cultures were taken, resulting positive for *Pseudomonas aeruginosa*. Complications such as stenosis phenomenon and stent thrombosis occur in approximately 2% of cases, while coronary stent infection occurs in less than 0.1% of cases.

**KEYWORDS:** stents, angioplasty, coronary artery disease, *pseudomonas aeruginosa*

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### INTRODUCTION

Coronary Artery Disease (CAD) is a major global health problem and causes approximately 126 million cases and 8.9 million deaths worldwide each year, being a chronic inflammatory disease of the coronary arteries, which leads to the accumulation of plaque within the tunica intima of the coronary artery, limiting blood perfusion throughout the heart. To restore normal blood flow within the coronary artery, the coronary artery is expanded using a balloon-tipped and a drug-eluting wire mesh stent is placed at the site of disease to prevent occlusion in a known process as restenosis. Drug-eluting coronary stents (DES) are the most effective option in

percutaneous coronary intervention while reducing restenosis. However, the implantation of a stent can cause other complications such as infection and thrombosis<sup>1,4</sup>.

Stent infection is as rare as access site infection but is associated with higher morbidity and mortality. With the increasing use of DES, there is a theoretical increased risk of infection, partly due to its immunomodulatory properties and delayed endothelialization<sup>2</sup>.

Stent infection can manifest in multiple ways, including arterial abscess, aneurysm, and pericarditis. The most common symptoms are fever, chills, and chest pain, with a variable time between placement and clinical presentation, reported from 2 days to the 4 months. The most implicated

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organism was *Staphylococcus aureus* (80%), followed by *Pseudomonas aeruginosa* (20%)<sup>2</sup>. Therefore, a case is reported in a patient with stent stenosis who developed a pseudomonal infection at the second level of care.

### CLINICAL PICTURE

A 51-year-old man with a history of systemic arterial hypertension, unstable angina a year before with angioplasty placing a stent in the left anterior descending and circumflex coronary artery, as well as residual lesion of the right coronary artery with total occlusion. His condition begins with oppressive chest pain of 8/10 intensity on the pain scale, which increases with physical activity, irradiating to the scapula and right arm, without predominance of time, accompanied by fever and diaphoresis, therefore who self-medicates isosorbide, referring to partial pain relief. Two days later, he presented a new picture of oppressive chest pain, intensity 10/10, radiating to the neck and left scapula, accompanied by nausea and vomiting, for which he went to the emergency department where an electrocardiogram with ST-segment depression in V3-V6 was performed. , with data of acute pulmonary edema, requiring mechanical ventilation; The hemodynamics department performed a coronary angiography that reported multiple-vessel coronary artery disease, stent restenosis of the circumflex and anterior descending artery, with chronic total occlusion of the right coronary artery, saccular aneurysm of the anterior descending artery, LVEF 50%. At 3 weeks he presented feverish peaks and new very high-risk angina events due to dynamic electrocardiographic changes in the anterolateral face, for which blood cultures were taken, being positive for *Pseudomonas aeruginosa*, he was maintained under medical management with antibiotic anticoagulation, enoxaparin, cardio selective beta blockade. An echocardiogram was performed with a report of lower apical and apex hypokinesia, rest of mobility preserved at rest, diastolic dysfunction with type 1 pattern, LVEF 67% mild tricuspid regurgitation, TAPSE 25mm PSAP 30mmHg. Four days later, an episode of sinus tachycardia and hemodynamic instability with oppressive pain was documented. The electrocardiogram with a heart rate of 155 without dynamic changes, it was decided to administer adenosine and amiodarone, evolving with hypotension refractory to fluid therapy, a vasopressor (norepinephrine) began, persisting with instability, despite medical Management of the patient with a torpid evolution presenting asystole.

### DISCUSSION

Complications such as stricture phenomenon and stent thrombosis occur in approximately 2% of cases, whereas coronary stent infection (CSI) occurs in less than 0.1% of cases (all these instances are limited to reports of cases). The first CSI case report described a Palmaz-Schatz stent infection

in a 66-year-old woman in 1993<sup>2</sup>.

The patient died despite undergoing emergency heart surgery. A previous study that reviewed 23 cases showed that the CSI mortality rate was 39%. Repeated local punctures (mainly in the inguinal area), reuse of the balloon or catheter without proper sterilization, repeated manipulations of the guidewire, and prolonged indwelling catheterization may increase the risk of stent infection<sup>3</sup>.

Although cases have been reported with a good outcome solely with the use of antibiotics, ideally the treatment should consist of antimicrobial and surgical management, since the latter provides a definitive diagnosis, removal of the infectious focus and repair of possible associated lesions such as aneurysms, although the duration and the ideal antimicrobial scheme are unknown, it is recommended to be broad-spectrum, with coverage for *staphylococcus aureus* and *pseudomonas aeruginosa*<sup>3</sup>.

Between 2001 and 2011, a significant increase in the use of medicated stents was reported; however, there was a decrease from 2007 after reports of late stent thrombosis as a potential complication. The main risk factors for developing infectious complications after the procedure are congestive heart failure, age greater than 60 years, male gender, and procedure-related risk factors such as difficult vascular access, repeated catheter insertion, and duration of retention of the introducer<sup>1,2,4</sup>.

Much research has been done in search of alternative strategies to prevent and treat biofilm-based infections. It has been said that the best possible treatment for biofilm-based infections is to inhibit the initial adhesion stage, thus preventing infection from starting. Gold, diamond, and titanium coating treatments have also been shown to be highly effective in reducing microbial adhesion, proliferation, and biofilm growth, as have nanomaterials containing zinc oxide, titanium oxide, polymers, and nanotubes. of carbon, being these promising in the near future<sup>5</sup>.

Other risk factors for coronary stent thrombosis (CST) have been widely documented, being acute myocardial infarction (as the reason for initial stent implantation), chronic renal failure, diabetes mellitus, interruption of antiplatelet therapy, residual dissection. of the vessel after stenting and stenting in bifurcated lesions. However, the role of other risk factors, including stent length and diameter, ejection fraction, multivessel coronary disease, calcified lesions, and emerging resistance to antiplatelet drugs, is still debated<sup>6</sup>.

Likewise, according to the 2010 Interventional Radiology Society guidelines, they do not suggest the use of prophylactic antibiotics. However, the patient must be individualized, and its use assessed in those patients who have risk factors, such as immunocompromised patients (Diabetes, over 60 years of age, kidney transplant) or prolonged surgical shift<sup>7</sup>.

### CONCLUSION

Coronary artery disease is a major global health problem, although stent-associated infections are rare, they cause high morbidity and mortality, so suspicion of coexistence is

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relevant to initiate an adequate approach, and this can improve the prognosis.

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