strokes was the same in both experimental groups, and the numbers of neurologic events and thromboembolism and thrombosis were higher in the test group (2.07%/patient-year and 1.46%/patient-year). Thus the real benefit of lower anticoagulation levels with warfarin and aspirin is a reduction in bleeding. Thromboembolic episodes still occur.

For the past 13 years, my institution has followed up patients (n = 215) with MAPs who are being treated with the antiplatelet agent clopidogrel bisulfate (INN clopidogrel) or prasugrel hydrochloride (INN prasugrel) plus aspirin as sole anticoagulants. This protocol is based on the principle that embolism after aortic valve replacement is a platelet-mediated event, as described by Becker and associates.² This idea is not new, because the concept was tested with excellent results in 1986.³

In our series of 215 patients (791.1 patient-years) on a regimen of the antiplatelet agent clopidogrel or prasugrel plus aspirin, the incidence of bleeding has been 1.1%/patient-year, that of transient ischemic attack has been 0.3% patient-year, and that of stroke has been 0.88%/patient-year.⁴ When the patients respond to the antiplatelet agent, take their medication, and are compliant, no strokes or transient ischemic attacks have been observed.⁴

With the advent of prasugrel in 2009, we resolved this issue of clopidogrel hyporesponsiveness, and all patients are fully protected from thromboembolism within 24 hours. Patients are loaded with clopidogrel and aspirin. They are tested with the Accumetrics assay (Accumetrics, San Diego, Calif) and thromboelastographic platelet mapping 6 hours after loading. If the patient does not respond to clopidogrel (>50% platelet inhibition) even after a reloading dose of clopidogrel, a loading dose of prasugrel is given. All patients have responded to prasugrel. The maintenance regimen depends on which agent the patient responds to and is

either clopidogrel at 75 mg or prasugrel at 10 mg and aspirin at 81 mg.

In 2009, we reported our initial experience with antiplatelet therapy for patients with MAP.⁵ At that time, clopidogrel resistance was difficult to deal with, and an algorithm was developed. More recent results, incorporating the prasugrel experience, were presented in a poster at the 2013 Congress of the American Heart Association.⁵ The 13-year summary was submitted to the annual meeting of the European Association for Cardio-Thoracic Surgery.

Because of the specificity and success of antiplatelet therapy (treating platelet-mediated events with antiplatelet agents), it is desirable that prospective randomized studies be performed to confirm our results and settle the issue the presumed efficacy of antiplatelet agents for thromboprophylaxis.

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<http://dx.doi.org/10.1016/j.jtcvs.2014.08.045>

RE: PREDICTORS OF OUTCOME AND DIFFERENT MANAGEMENT OF AORTOBRONCHIAL AND AORTOESOPHAGEAL FISTULAS

To the Editor:

In their recent article in the *Journal*, Mosquera and colleagues¹ reported an interesting single-center historic cohort study on their experience in the treatment of aortobronchial (ABFs) and aorto-esophageal fistulas (AEFs).

AEFs and ABFs are uncommon lesions. If untreated, they carry a mortality approaching 100% as a result of exsanguination. The treatment of choice is still not standardized. Open surgical repair (extra-anatomical or in situ reconstruction) with synthetic vascular prosthesis or cryopreserved homograft, aortic stent-graft placement with thoracic endovascular aortic repair (TEVAR), and conservative medical approaches are all available. Open surgical repair is associated with a high mortality, ranging from 25% to 41%, and TEVAR provides a less-invasive yet still lifesaving and reliable method of treatment for AEFs and ABFs.²⁻⁵

In the study of Mosquera and colleagues,¹ 11 patients did not undergo any surgical treatment; of these, 9 patients were deemed not to be candidates for surgical or endovascular repair because of malignancy, age, or premorbid conditions. In-hospital surgical mortalities were 26.7% in the open surgery group and 37.5% in the TEVAR group, and those patients who had undergone open repair had better actuarial survivals at 1 and 5 years ($P = .04$).

One potential life-threatening complication is prosthetic infection. Although a stent-graft prosthesis may be considered a potential infection carrier, TEVAR has been successfully used to treat AEFs and ABFs.

Moreover, late complications of TEVAR, including postprocedural AEFs and ABFs, have become more evident with time. The exact pathophysiologic mechanisms of AEF formation after TEVAR are unknown. Hypotheses include (1) direct erosion of the aortic wall, (2) pressure necrosis of the esophageal or bronchial wall from the self-expansion of the endoprosthesis, (3) ischemic necrosis caused by stent-graft coverage of aortic side branches feeding the esophagus or bronchus, and (4) esophageal or bronchial wall erosion caused by infection of stent-graft prosthesis.

For these reasons, we agree with Mosquera and colleagues¹ that TEVAR in the treatment of ABFs and AEFs is a bridge solution and that close follow-up is mandatory. Our question for them is as follows: what diagnostic methods, in your opinion, should be more sensitive and specific to monitor a possible reinfection during follow-up?

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THE KEY FOR SUCCESSFULLY MANAGING AORTOBRONCHIAL AND AORTOESOPHAGEAL FISTULAE MAY LAY IN THEIR ETIOLOGY

Reply to the Editor:

Aortoesophageal fistulas (AEFs) and aortobronchial fistulas (ABFs) are uncommon but life-threatening conditions whose outcomes are ultimately determined by the etiology of the fistulas. Both open and endovascular management of aortic fistulas can prevent death by exsanguination, but patients remain at high risk for infectious complications.

We have recently published a study¹ of a consistent series of 26 consecutive patients with thoracic aorta fistulas (18 ABFs and 8 AEFs). The aim of this study was to identify potential differences in the early and long-term results, stratified by the etiology, type, and management of the fistulas, and also to determine the predictors of mortality in this critical subset of patients.

All patients in our series who sustained an aortic fistula with an infectious cause died during hospitalization, and those who sustained an aortic fistula with an underlying malignancy as the primary cause presented a poor midterm prognosis.¹ In the literature, in-hospital mortalities associated with aortic fistulas secondary to mycotic aneurysms or graft infections range between 25% to 60%,²⁻⁴ whereas those caused by esophageal or lung malignancies are associated with a mortality close to 30%.^{3,5}

On the contrary, patients in our series with posttraumatic fistulas showed a great long-term survival because in those cases aortic surgery alone was curative. We concluded, as have other authors, that patients with posttraumatic fistulas, as well as fistulas caused by ingestion of a foreign body or atherosclerotic aortic pathology, are the ideal candidates for endovascular treatment.^{2,4,5}

Midterm and long-term outcomes are ultimately conditioned by the fistula etiology. Failure to treat the underlying cause therefore entails a poor midterm outcome.¹

Treatment modality was identified as a predictor of in-hospital mortality among patients with aortic fistulas in our study, as were sepsis and hemodynamic instability on admission.¹ Mortality was 100% among patients selected to undergo a conservative management.¹ In-hospital mortality associated with open surgery ranges between 15% and 25% for ABF^{6,7} but tends to be even higher for AEF.⁸ In contrast, 30-day mortality after ABF and AEF treated with thoracic endovascular aortic repair (TEVAR) has been reported to run between 28% and 45%.^{2,5} In our series, in-hospital mortality among the patients undergoing open repair was slightly lower than that among the patients undergoing TEVAR (14.3% vs 37.5%). The group of patients undergoing TEVAR not only presented an older mean age and with a higher logistic euroSCORE but also included patients with fistulas caused by infection or malignancy who were not considered candidates for open surgery. The advent of TEVAR has expanded the spectrum of patients amenable to surgical repair despite their critical condition, advanced age, and severe comorbidities, including malignancies.^{1,2,5}

It must be highlighted that almost 36% of the patients enrolled in our study had sepsis on arrival at the hospital or had sepsis develop shortly after admission. In fact, septic shock was the most common cause of in-hospital death.¹ Even when successful open or endovascular treatment has been accomplished, most patients remain at high risk for infectious complications.⁴ Long-term or lifelong treatment with oral suppressive antibiotics should be considered when an endovascular approach is performed or when it has not been possible to remove all the infected tissue or graft