Terminal ischemic cardiomyopathy associated to stent extrusion to the aortic lumen

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Ischemic cardiomyopathy is the most common cause of heart failure in Brazil [1]. It is caused by obstruction of the lumen of at least one of the epicardial coronary arteries, which leads to multiple abnormalities of segmental contraction or diffuse hypokinesia, culminating in a remarkable decrease in left ventricular ejection fraction [2]. Although half of the patients had angina pectoris following the systolic heart failure, one should be emphasized that ischemic cardiomyopathy without angina pectoris actually occurs [3]. The prognosis of patients with ischemic heart disease is progressive, probably because the vast extent of restorative myocardial fibrosis and less sample of myocyte hypertrophy in ischemic patients [4].

Primary coronary interventions, or that is, those performed without primary fibrinolytic therapy is an established treatment modality for patients with acute myocardial infarction with ST-segment elevation. In fact, the primary coronary intervention was shown to reduce mortality and improve left ventricular contractility and improve the clinical course in patients with this condition [5]. However, the time for coronary intervention is crucial to the success of primary coronary intervention: it can not exceed 12 hours after onset of symptoms [6], and the time of first contact until the doctor inflates the balloon should not exceed two hours [5]. Despite the undoubted benefits, the primary coronary intervention is not without complications. Coronary dissection, for example, occurs in 20 to 40% of patients after this procedure, and can be treated with stenting or bypass implantation [7].

In this volume of BJCVS, Braulio et al. [8] reported an interesting clinical case of ischemic cardiomyopathy treated successfully with terminal heart transplant. The patient had acute myocardial infarction with ST-segment elevation 14 months after heart transplantation, appropriately treated with percutaneous transluminal coronary artery, complicated, however, by dissection of the left coronary artery, which, in turn, was treated with stenting. The patient developed chronic systolic heart failure, whose clinical course was progressive, despite the apparent success of the hemodynamic treatment. The explanted heart revealed severe coronary obstructions in coronary artery and left anterior descending coronary artery. In addition, it was found extrudion of the stent into the aortic lumen, obstructing the left circumflex artery.

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One question that emerges from this case concerns the best treatment for coronary artery dissection in relation to the mid-term prognosis. Implant bypass has been used in the treatment of coronary artery dissection after transluminal angioplasty of coronary artery without success [7]. However, the mortality rate associated with this procedure is still high, ranging from 4% to 14% [9]. An alternative treatment for coronary artery dissection is the stent, as was performed in the case reported by Braulio et al. [8]. However, the long-term effects of stenting with respect to the maintenance of patency of coronary artery flow and reversing left ventricular remodeling process is still unknown. So, I guess, if the implant bypass had been performed in the case reported by Braulio et al. [8], the onset of ischemic heart disease could have been avoided, or at least mitigated.

Another key aspect that deserves further discussion is a rare complication reported by Braulio et al. [8], ie, the extrusion of the stent to the aortic lumen with concomitant occlusion of the circumflex artery. The presence of this abnormality was not suspected, probably because of the absence of angina. Therefore, this case suggests that stent extrusion with concomitant coronary occlusion may be the mechanism underlying the clinical deterioration in patients with ischemic heart failure, who underwent stenting because of coronary dissection. Moreover, it also suggests that coronary angiography should be performed even if there is myocardial viability in sestamibi myocardial scintigraphy, as can be seen in the case reported by Braulio et al. [8].

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Ischemic cardiomyopathy should be treated according to the current evidence-based medicine for chronic heart failure advocates, particularly with beta-blocker therapy [1]. However, it should be emphasized that the effectiveness of beta blockers is greater in patients with myocardial viability, and virtually similar to that obtained with myocardial revascularization by angioplasty or coronary artery bypass graft implantation [10]. In fact, beta-blockers work by increasing the contractility of the remote areas of infarcted tissue, thus improving the overall left ventricular contractility [10]. Therefore, if the myocardial perfusion scintigraphy with sestamibi shows only fibrosis, it is recommended to myocardial perfusion scintigraphy with thallium for detection of hibernating myocardium.

When medical treatment fails to ischemic cardiomyopathy, myocardial revascularization can be attempted if there is viable underlying myocardium [1]. Since one third of patients with ischemic cardiomyopathy without angina have left bundle branch block [3], ventricular resynchronization therapy can be offered to patients with this condition, although I recognize that such therapy has not been tested specifically in patients with ischemic cardiomyopathy. Transluminal angioplasty of coronary artery or bypass graft implant can be used for CABG because both induce improvement in left ventricular contractility in dysfunctional areas or segments adjacent to infarcted areas, thus acting synergistically with beta-blocker therapy for reverse ventricular remodeling. Probably because of the small number of complications, percutaneous transluminal coronary artery may have a better prognosis than the implantation of coronary bypass in patients with ischemic cardiomyopathy [11]. In refractory ischemic heart disease, as observed in the case reported by Braulio et al. [8], heart transplantation is valid treatment option.

In conclusion, with the case reported by Braulio et al. [8], refractory ischemic cardiomyopathy should be added to the list of complications of stenting as a treatment for coronary artery dissection caused by percutaneous transluminal coronary artery in patients with acute myocardial infarction with ST-segment elevation.

REFERENCES

1. Bocchi EA, Braga FG, Ferreira SM, Rohde LE, Oliveira WA, Almeida DR, et al. III Brazilian Guidelines on Chronic Heart Failure. Arq Bras Cardiol. 2009;93(1 Suppl1):3-70.

2. Yatteau RF, Peter RH, Behar VS, Bartel AG, Rosati RA, Kong Y. Ischemic cardiomyopathy: the myopathy of coronary artery disease. Natural history and results of medical versus surgical treatment. Am J Cardiol. 1974;34(5):520-5.

3. Bestetti RB, Yoshitake R, Cardoso TA, Freitas PF, Cordeiro JA, Theodoropoulos TA. Clinical characteristics and outcome of chronic ischemic heart failure in angina-free patients. Int J Cardiol. 2008;128(1):145-6.

4. Hare JM, Walford GD, Hruban RH, Hutchins GM, Deckers JW, Baughman KL. Ischemic cardiomyopathy: endomyocardial biopsy and ventriculographic evaluation of patients with congestive heart failure, dilated cardiomyopathy and coronary artery disease. J Am Coll Cardiol. 1992;20(6):1318-25.

5. Van de Werf F, Bax J, Betriu A, Blomstrom-Lundqvist C, Crea F, Volkmar F, et al; ESC Committee for Practice Guidelines (CPG). Management of acute myocardial infarction in patients presenting with persistent ST-segment elevation: the Task Force on the Management of ST-Segment Elevation Acute Myocardial Infarction of the European Society of Cardiology. Eur Heart J. 2008;29(23):2909-45.

6. Silber S, Albertsson P, Avilés FF, Camici PG, Colombo A, Hamm C. Guidelines for percutaneous coronary interventions. The Task Force for Percutaneous Coronary Interventions of the European Society of Cardiology. Eur Heart J. 2005;26(8):804-47.

7. Breda JR, Breda AS, Pires AC. Operative treatment after iatrogenic left main dissection. Rev Bras Cir Cardiovasc. 2008;23(2):268-71.

8. Braulio R, Gelape CL, Brasileiro Filho G, Moreira MCV. Cardiomiopatia isquêmica terminal associada à complicação do uso de stent no tratamento de infarto agudo do miocárdio. Rev Bras Cir Cardiovasc. 2011;26(3):481-4.

9. Barakate MS, Bannon PG, Hughes CF, Horton MD, Callaway A, Hurst T. Emergency surgery after unsuccessful coronary angioplasty: a review of 15 years' experience. Ann Thorac Surg. 2003;75(5):1400-5.

10. Kaandorp TA, Bax JJ, Bleeker SE, Doombos J, Viergever EP, Poldermans D, et al. Relation between regional and global systolic function in patients with ischemic cardiomyopathy after beta-blocker therapy or revascularization. J Cardiovasc Magn Reson. 2010;12:7.

11. Buszman P, Szkróbka I, Gruszka A, Parma R, Tendera Z, Lésko B, et al. Comparison of effectiveness of coronary artery bypass grafting versus percutaneous coronary intervention in patients with ischemic cardiomyopathy. Am J Cardiol. 2007;99(1):36-41.

12. Gama HC, Martin W, Naik SK. Remodelamento cirúrgico do coração no tratamento cirúrgico da cardiomiopatia isquêmica. Rev Bras Cir Cardiovasc. 2001;16(2):114-8.

13. Ribeiro GCA, Nunes A, Antoniali F, Lopes MM, Costa CE. Benefício da revascularização do miocárdio em pacientes com disfunção ventricular e músculo viável: remodelamento ventricular reverso e prognóstico. Rev Bras Cir Cardiovasc. 2005;20(2):117-22.