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Commentary: Be flexible!

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CENTRAL MESSAGE

Flexibility is the most important characteristic of ePTFE. Once calcium accumulates on its structure, tension increases, flexibility is lost, and neochordae may fracture.

Mitral valve repair is the gold standard treatment for degenerative mitral valve regurgitation. A plenty of surgical technique have been described.[1] Among these, the ''respect rather than resect'' approach has become popular among surgeons, especially because it facilitates the procedure through a minimally invasive approach. The implantation of artificial expanded polytetrafluoroethylene (ePTFE) chordae enables correction of the prolapsing segment of mitral valve, displacing the abnormal tissue into the ventricle, and ensures a large surface of coaptation while preserving the leaflet tissue. Results are excellent and associated with high freedom of reoperation.[2,3] The rupture of ePTFE neochordae is a rare complication after mitral valve surgery. Luthra and colleagues[4] reported a case of late failure of mitral valve repair due to fracture of ePTFE neochordae. At the surgical inspection, the neochords were found to be stiff and calcified and associated with subchordal apparatus thickening.

Butany and colleagues[5] described the first case of late chordal rupture.[5] Since then few other cases have been described.[6] On conducting a literature review, Bortolotti and colleagues[7] found 4 cases of recurrent mitral regurgitation due to the late (ie, 6-14 years postoperatively) rupture of ePTFE chordae. In all cases, chordal rupture was related to the calcification of ePTFE. Despite the fact that this case report is not new, Luthra and colleagues[4] add evidence of the importance of continuous monitoring of patients undergoing mitral valve repair with ePTFE, especially when the follow-up extends beyond 10 years.

Major characteristics of ePTFE are flexibility and its maintenance over the time. At the beginning, neochordae are covered by fibrous tissue without a detectable endothelial layer. Then they are encapsulated with fibrous tissue covered with endothelium, making them indistinguishable from native chordae. During this evolution, ePTFE maintains its flexibility and function. However, with the passage of time, reports show that neochordae may degenerate, become stiff, and accumulate calcium. The loss of flexibility determines tension, which increases the mechanical stress and consequently neochordae fracture.[8]

Unfortunately, as with other researchers, these authors were not able to provide histological examination of neochordae explanted, and therefore we cannot provide the real mechanism of chordal rupture. In light of these considerations, it is mandatory that patients undergoing mitral valve require echocardiographic examination every year to identify those at risk for calcification and possible fracture.

In presence of this complication, one might opt toward the French correction, which has provided excellent results up to 20 years.[9] However, a recent meta-analysis concludes that chordal replacement is associated with greater freedom from reoperation and improves postoperative left ventricular function compared with leaflet resection.[10] Probably the truth is in the middle: ''Respect when you can, resect when you should.''[11] Be flexible!

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