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Mitral Valve Injury After Radiofrequency Ablation for Wolff-Parkinson-White Syndrome

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A 39-year-old athletic female with symptomatic Wolff-Parkinson-White syndrome underwent an electrophysiological study and subsequent ablation of orthodromic reentrant tachycardias using left lateral, posterolateral, and posteroseptal accessory pathways. Ablation was performed with 7F medium- and large-curl Safire catheters using the retrograde aortic approach. Eighteen radiofrequency lesions were delivered at the mitral valve annulus (50 W, 60°, 10–60 seconds), and 8 were delivered in the coronary sinus, with weak persistence of antegrade conduction through the posteroseptal pathway. Two weeks later, she presented to the emergency room with a new episode of supraventricular tachycardia. She had been having dyspnea since the ablation procedure. A transthoracic echocardiogram revealed severe mitral regurgitation with a regurgitant volume of 66 ml and estimated regurgitant orifice of 39 mm² (Figure [C, F, and G]); the left atrium was enlarged with a volume index of 36 ml/m². Transesophageal echocardiogram revealed a ruptured chord to the anterior leaflet adjacent to the posteromedial commissure (Figure [E]). Given the symptoms and severity of the mitral valve regurgitation, the decision was made to proceed with surgical intervention. The patient was taken to the operating room. An intraoperative transesophageal echocardiogram confirmed severe mitral regurgitation with small flail segment at the posteromedial commissure and an ejection fraction of 65%.

Median sternotomy and standard aortic and right atrial cannulation with a 2-stage venous cannula were performed. Cardiopulmonary bypass was initiated, and the heart was arrested with antegrade cardioplegia. On opening of the left atrium and exposure of the mitral valve, it was clear that there was a ruptured chord to the anterior leaflet corresponding to the medial (A3) scallop at the level of the posteromedial commissure. Additionally, there were reddened thickened excoriated areas along the posteromedial mitral annulus and the posterior mitral leaflet (Figure [H]). The quality of the tissue was rather poor and appeared to be partially necrotic. Therefore, we were concerned about anchoring neochords at this location. Instead, we plicated the posteromedial commissure using 2 pledgeted 4-0 polypropylene sutures and placed a 63-mm posterior annuloplasty band anchored between left and right fibrous trigones (Figure [I]). The cross-clamp was

released after a total of 43 minutes. A transesophageal echocardiogram showed trivial mitral regurgitation and a transmitral mean gradient of 3 mm Hg at a heart rate of 50 bpm. The patient was dismissed from the hospital on postoperative day 5. Dismissal transthoracic echocardiogram confirmed trivial mitral regurgitation, no evidence of systolic anterior motion of the mitral valve, and good biventricular function.

Discussion

Radiofrequency ablation is an effective procedure for the treatment of arrhythmias, especially Wolff-Parkinson-White syndrome. The incidence of major complications has been reported to be between 3% and 4%.¹ Even though the complication rate is low using radiofrequency, ablating left-sided accessory pathways has the potential for injury of mitral valve when a retrograde approach is used because the catheter is placed under the posterior leaflet of the mitral valve and the current is delivered along the atrioventricular annulus. Postablation mitral regurgitation is usually mild and does not require surgical treatment.¹ There are a few case reports of mitral regurgitation resulting from a perforation of the posterior leaflet several months or even years after the ablation. The perforation was thought to be caused by either catheter manipulation or direct current injury from radiofrequency, but because the injury was found in a delayed fashion, it was difficult to differentiate between the two.^{2,3} In our case, the appearance of mitral valve leaflet damage suggested that the radiofrequency current was responsible for a direct thermal injury to the anterior leaflet tissue and its cord (Figure [H]). We are not aware that this injury has been documented before in the literature. We elected to plicate the anterior and posterior leaflet at the posteromedial commissure with 2 pledgeted horizontal mattress sutures closing as has been described previously.⁴ Even though artificial chords have shown good long-term durability for anterior leaflet prolapse, the poor quality of the tissues in our case made plication more attractive than an artificial neochord owing to the risk of tearing through the compromised leaflet insertion. The repair was supplemented with a 63-mm flexible posterior annuloplasty band as previously described for all mitral valve repairs at our institution with durable results.⁴

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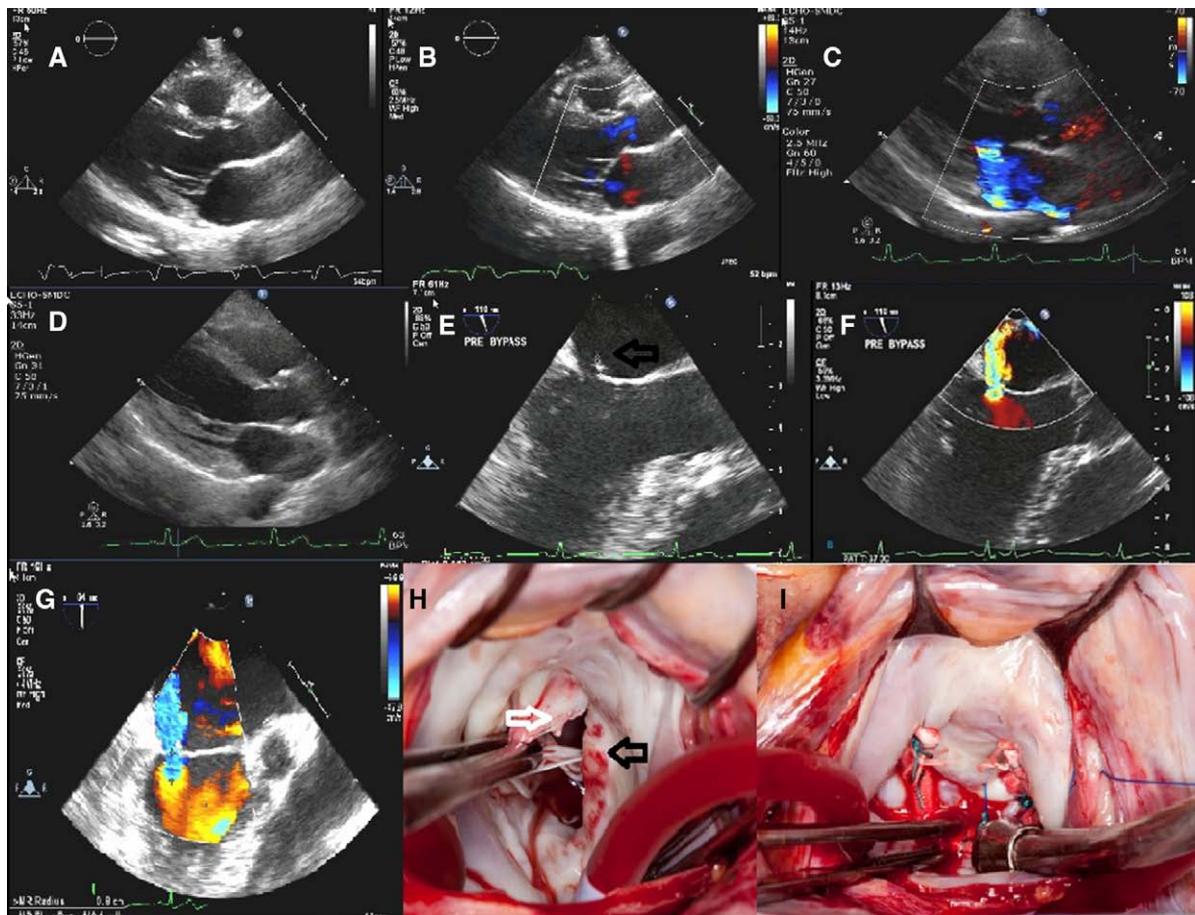


Figure. **A** and **B**, Preablation transthoracic echocardiogram, parasternal long-axis view, demonstrating only trivial mitral regurgitation before the ablation. **C**, Postablation view. A significant jet of mitral regurgitation is now seen. **D**, Postablation parasternal long-axis view, 2-dimensional appearance. **E**, Intraoperative transesophageal echocardiogram, prebypass view of the mitral valve. Black arrow points to the ruptured chord. **F** and **G**, The eccentric jet of mitral regurgitation is shown with color. **H**, Mitral valve intraoperative photograph. A ruptured chord in the posteromedial, A3 scallop can be seen (white arrow). The posterior and anterior leaflets at the commissure level appeared echymotic and friable, suggesting a radiofrequency ablation injury to this area (black arrow). **I**, Mitral valve repair. Plication of the injured tissue at the posteromedial commissure with a 4-0 polypropylene suture and a 63-mm flexible posterior annuloplasty band in place.

Disclosures

None.

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