

## Acute coronary occlusion secondary to radiofrequency catheter ablation of a left lateral accessory pathway

P. CHATELAIN, M. ZIMMERMANN, R. WEBER, C. CAMPANINI AND R. ADAMEC

Cardiology Center, University Hospital, Geneva, Switzerland

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*A case of asymptomatic acute coronary occlusion secondary to radiofrequency catheter ablation of a left lateral accessory pathway is reported. Due to post-procedural ST modifications of the surface ECG, a coronary angiography was performed which disclosed total occlusion of the first marginal branch of the left circumflex coronary artery. Acute myocardial infarction was confirmed by moderate cardiac enzyme release, abnormal myocardial perfusion scan and mild lateral hypokinesia at echocardiography. This rare but potentially harmful complication of interventional electrophysiology should be kept in mind and coronary angiography performed immediately when coronary occlusion related to radiofrequency application is suspected.*

### Introduction

Radiofrequency ablation of accessory pathways is a recognised definitive therapy of tachyarrhythmias occurring within the Wolff–Parkinson–White syndrome<sup>[1,2]</sup>. Recently, the Multicentre European Radiofrequency Survey (MERFS) has reported complications in 4398 of these procedures<sup>[3]</sup>. However, acute coronary occlusion secondary to catheter ablation was not among them. We report a case of acute circumflex coronary artery occlusion secondary to radiofrequency catheter ablation of a left lateral accessory pathway.

### Case report

A 45-year-old woman was referred to our institution for recurrent symptomatic supraventricular reentrant tachycardia secondary to a left lateral accessory pathway first documented in 1988. Initially, the patient was treated with various drugs including propafenone, flecainide and amiodarone without satisfactory clinical improvement. Because of significant alterations in thyroid function under amiodarone therapy, thermoablation of the accessory pathway was proposed.

The resting ECG showed a patent permanent Wolff–Parkinson–White aspect with a delta wave in leads II, III, aVF, and from V<sub>1</sub> to V<sub>6</sub> (Fig. 1 upper panel). A new electrophysiological study confirmed the presence of a left lateral accessory pathway with a maximal antero-grade conduction of 180 beats . min<sup>-1</sup> and a maximal retrograde conduction of 290 beats . min<sup>-1</sup>. Ortho-dromic reentrant supraventricular tachycardia was easily inducible as was atrial fibrillation.

It was decided to proceed with thermoablation. The ablation catheter (7F Webster, large tip, no thermistor)

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Correspondence: P. Chatelain, MD, Cardiology Center, University Hospital Geneva, 1211 Geneva 14, Switzerland.

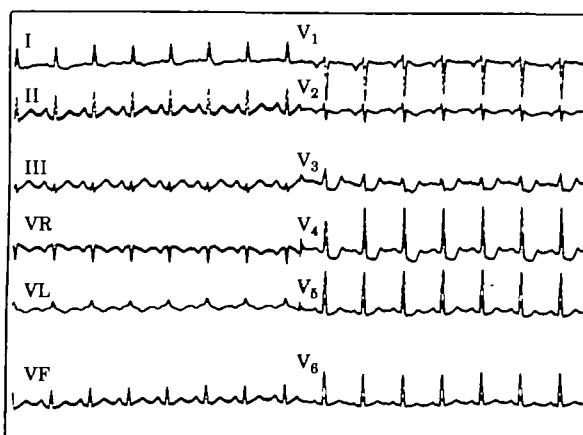
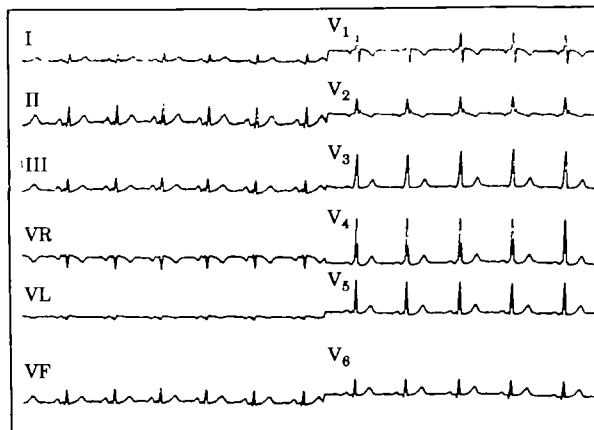


Figure 1 Upper panel: 12-lead electrocardiogram of the patient before the procedure showing sinus rhythm at 84 beats . min<sup>-1</sup> and positive delta waves in leads II, III, aVF, and from V<sub>1</sub> to V<sub>6</sub>. Lower panel: 12-lead electrocardiogram after the ablation procedure showing disappearance of the delta wave and significant ST changes in leads V<sub>2</sub> to V<sub>4</sub>.

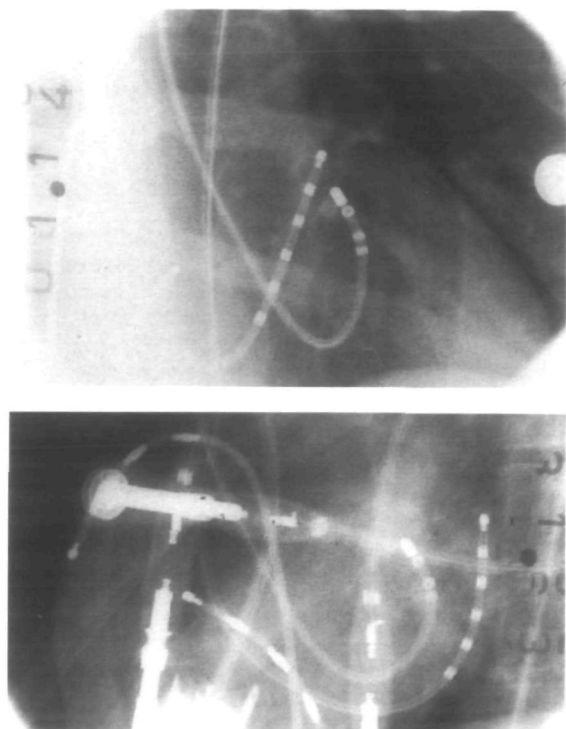


Figure 2 Right anterior oblique (top) and lateral (bottom) views of the thermoablation catheter in place in the ventricular side of the mitral annulus.

was inserted in the right femoral artery and a hexopolar recording catheter was inserted in the right jugular vein to record in the coronary sinus (Fig. 2). After easy localization of the left lateral accessory pathway, several shots were applied over a relatively localized area of the endocardium under the mitral annulus (retrograde transaortic approach). Each shot was of 30 s duration with a delivered energy varying between 28 and 43 W. After six of the 17 shots, transient disappearance of the pre-excitation was noted. The catheter was slightly repositioned after each unsuccessful radiofrequency application. No impedance rise was observed. After the 17th shot (final because it was successful) fast and permanent disappearance of the preexcitation was achieved. Following the procedure, a 12-lead ECG (Fig. 1 lower panel) showed ST changes in leads  $V_3$  to  $V_5$  attributed to a Chatterjee effect related to transient left bundle branch block observed during the procedure. The patient was asymptomatic. A control coronary angiogram was performed, which was initially considered normal, but disclosed, after review of the cinefilm, total occlusion of the first marginal branch of the circumflex coronary artery (Fig. 3). Non-Q wave myocardial infarction was confirmed by moderate increase of creatine kinase and SPECT imaging. Pericardial rub was absent as was pericardial effusion at echocardiography, which disclosed mild lateral hypokinesia. No other complication was observed and the patient was asymptomatic at discharge 6 days later.

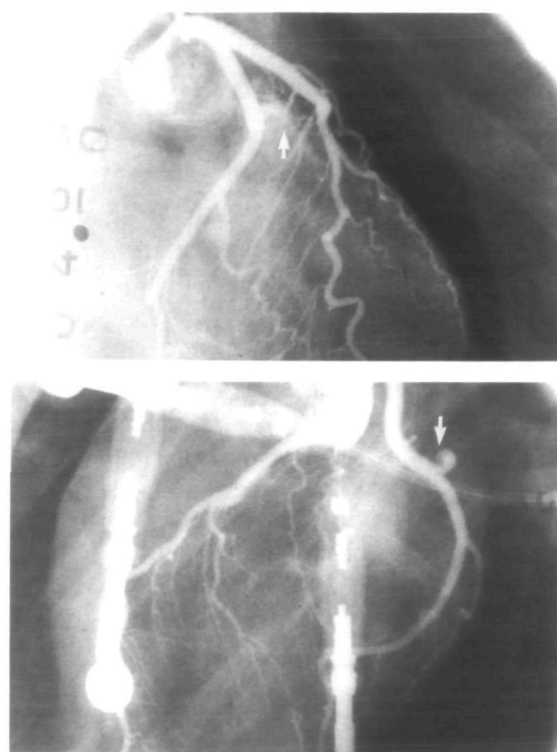


Figure 3 Biplane left coronary angiogram showing total occlusion of the first marginal branch of the circumflex coronary artery near its origin (arrows).

## Discussion

In this case, acute coronary occlusion was thought to be secondary to application of radiofrequency current during thermoablation of a left lateral accessory pathway. Comparison of the coronary angiogram with X-ray views of the ablation catheter in place disclosed anatomical correspondence between the latter and the marginal branch of the circumflex artery in which occlusion occurred. The mechanism responsible for the occlusion is not known and a recent study<sup>[4]</sup> failed to demonstrate any short-term effect of radiofrequency current delivery on coronary artery anatomy as assessed angiographically. However, by analogy to surgical techniques, it is suspected that electrocoagulation occurred in the artery leading to thrombotic occlusion.

After review of the medical literature, it appears that acute coronary occlusion as a complication of radiofrequency ablation of accessory atrioventricular pathways is rare. Indeed, the recent MERFS survey<sup>[3]</sup> and Scheinmann<sup>[5]</sup> reported, respectively, a 4.4% and a 3.8% incidence of complications in large series, but acute coronary occlusion was not among them. However, a case similar to ours (left free wall accessory pathway, left ventricular side current application, and left circumflex coronary artery occlusion) has been reported by Calkins *et al.*<sup>[6]</sup>. In that particular case, acute occlusion was successfully treated by coronary angioplasty 30 min later. However, significant creatine kinase increase and

mild left ventricular dysfunction occurred thereafter. In our case, because of off-line diagnosis of the complication and relatively small size of the coronary vessel in which occlusion occurred, there was no attempt to recanalize it.

A later publication of the group mentioned above<sup>[7]</sup> has reported another case of an ischaemic complication after delivery of radiofrequency current in a similar situation. However, in that case, as in one reported by Lesh *et al.*<sup>[8]</sup>, a coronary angiogram performed immediately after was normal.

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