

Chapter 22

Air Embolism During Septostomy



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Abstract Systemic and coronary air embolism is one the complications in left heart catheterizations and also could be seen during septostomy. In this case we had it in a patient with left side accessory pathway during septostomy.

A 30-year-old female with a history of frequent episodes of supraventricular tachycardia presented with ECG manifestations of minimal left side accessory pathway and WPW syndrome.

An electrophysiologic study was performed in conscious sedation status, and diagnostic catheters were introduced via the left and right femoral vein.

Intracardiac electrograms were recorded using the Bard (Boston scientific) electrophysiology system.

The evaluation of the conduction system revealed the most fused AV signal in the left lateral side of the coronary sinus (CS) (Fig. 22.1).



Fig. 22.1 The most fused AV signal in the left lateral side of the coronary sinus

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The retrograde conduction pattern was also eccentric and the earliest retrograde atrial signal was recorded in the distal part of the CS during RV pacing.

A narrow QRS tachycardia was reproducibly inducible with programmed atrial and ventricular stimulation.

We attempted to do septostomy with Agillis long sheet (Agillis NxT™ Steerable Introducer, St. Jude Medical).

Needle was proceeded into the left atrium without the need for puncture of the interatrial septum.

Immediately after septostomy, we observed air bubbles in the left ventricular apex (Fig. 22.2).

Immediately 100% oxygen was administrated. Right femoral artery was cannulated and a pigtail catheter (Dawson–Mueller Drainage Catheter) was introduced via femoral artery with a retrograde approach into the left ventricular cavity and suction was done.

During suction ST elevation in the inferior leads was appeared with sinus bradycardia and manifest accessory pathway conduction infavor of AV block (Fig. 22.3).

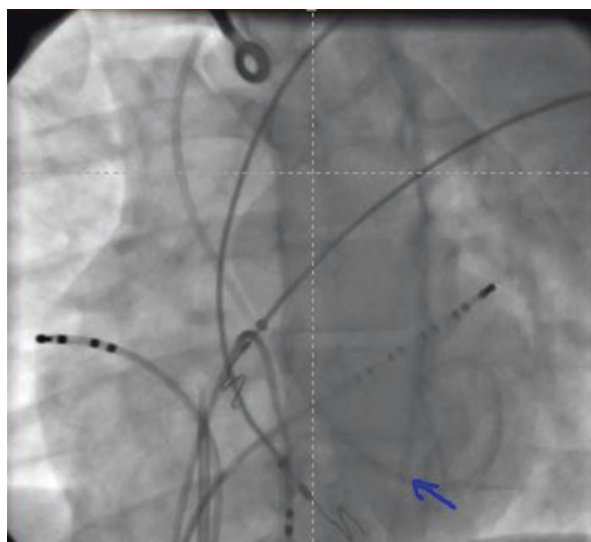
Rapid RV pacing was done, 100% Oxygen was administrated and Inotrope was injected too. ST elevation was resolved in about 1–2 min.

The procedure was terminated without any attempt for ablation.

Propofol injection was omitted, after consciousness, the patient was alert and awake with obey to orders but with left side hemiparesis without left central hemifacial weakness.

Brain CT scan was done and was normal. The distal force of left upper extremity was resolved in about 1 h but yet the proximal force of the left arm and total force of the left leg was compromised. The neurologic consult was done and heparin drip and dexamethasone were recommended by the neurologist.

Fig. 22.2 Air bubbles in the left ventricular apex



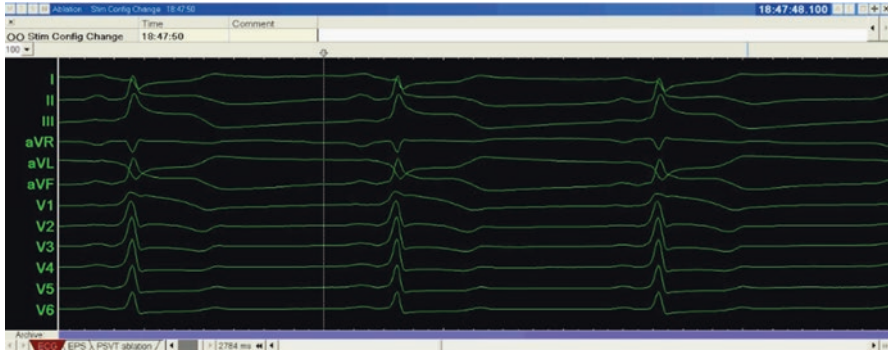


Fig. 22.3 Manifest AP with bradycardia and inferior ST elevation

After 24 h of procedure, all forces returned to normal status and after 72 h patient was discharged with the good general condition without any problem.

Follow-up of the patient showed no any problem and redo procedure was done 14 days later and the accessory pathway was successfully ablated via a retrograde approach.

Transesophageal echocardiography in the second admission revealed a patent foramen oval (PFO) with size about 2×5 mm and right to left shunt.

Discussion

RFA for WPW syndrome could be done via retrograde or transseptal approach. Retrograde approach may be associated with the risk of prolonged catheter manipulation and potential arrhythmogenic ventricular lesions created during ablation [1–3].

Potential risks can be avoided using transseptal atrial insertion. This approach was developed in 1950s and nowadays is on the most useful approaches for the ablation of the left-sided targets in electrophysiology studies [4].

Lesh et al. reported one case of coronary air embolism complicating transseptal radiofrequency ablation of the left lateral accessory pathway during catheter exchange and recommended continuous flushing with heparinized saline during catheter exchange.

Khurram et al. in 2016 reported a case of catastrophic coronary air embolism during AF ablation with massive air embolism into the RCA leading to the hemodynamic collapse and successful management with catheter-based coronary aspiration [3].

Murat Tulmac et al. reported a case of massive systemic air embolism during aortic root angiography in 2012, with the collapse of the patient and pulseless electrical activity. The patient became electrically stable shortly after cardiopulmonary resuscitation but she had a garbled speech and left hemiplegia with partial weakness and paresthesia in the right leg and arm. The brain CT was of the patient was normal

such as our patient and the patient was transferred to the center with facility of hyperbaric oxygen chamber treatment (HBOT), and all of the neurological functions were normal after 1 day.

We do not have facility of HBOT but we administered 100% O₂ and after 24 h everything was normal and the patient was discharged after 72 h without any residual defect.

References

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