

Entrapment and fracture of a 'lasso-like' ACHIEVE™ catheter in a pulmonary vein branch during isolation by balloon cryoablation

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Pulmonary vein (PV) isolation complications range from vascular damage to death. Only a few cases of catheter entrapment in a PV and/or fracture in the mitral apparatus have been reported. We describe the first case of an ACHIEVE® catheter fracture and entrapment in a PV during cryoablation.

Case presentation

A 37-year-old male was referred for refractory symptomatic paroxysmal atrial fibrillation. Following a trans-septal puncture, an Arctic Front Advance® cryoballoon with a support of an ACHIEVE Mapping Catheter® (Medtronic Ablation Frontiers LLC) were used and a successful isolation of the left and the right inferior pulmonary vein (PV) was performed. After isolation of the right superior PV, we were unable to pull back the ACHIEVE catheter entrapped at his distal part in a branch of this vein. Multiple manipulations were undertaken to dislodge the catheter including rotational manoeuvres, ending by the fracture of the 'lasso-like' tip of the ACHIEVE® catheter. Attempts to remove the tip by using a snare catheter were unsuccessful. The potential benefits and complications of surgical removal were carefully evaluated and it was decided to leave the foreign body in the PV. A chest X-ray confirmed the location of the tip of the catheter without any signs of parenchymal abnormalities (Figure 1A). Successive trans-thoracic echocardiographies showed no pericardial effusion. A chest computed tomography scan with three-dimensional reconstruction exposed the catheter tip entrapped in a non-occluded segmental PV in the posterior segment of the right superior pulmonary lobe (Figure 1B). Given his stable clinical status the patient was discharged on vitamin K antagonists (VKAs) with a target international normalized ratio between 2 and 3. After 4 months, no complications occurred and the asymptomatic patient was kept on same medical therapy.

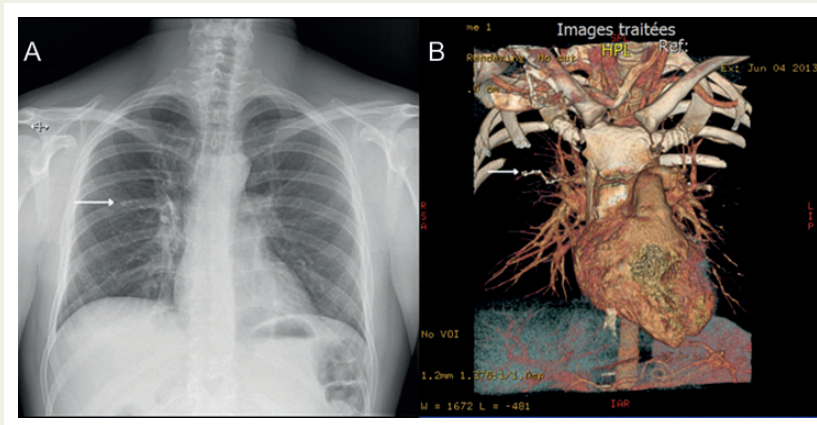


Figure 1 (A): Chest X-ray showing the location of the distal part of the ACHIEVE catheter in the posterior segment of the right superior pulmonary lobe (Arrow) (B): Chest computed tomography scan with three-dimensional reconstruction of the heart and the pulmonary vasculature; the ACHIEVE catheter is clearly visible in the segmental pulmonary vein (Arrow).

Discussion

Major complications of PV isolation (PVI) reported in the medical literature are estimated to be up to 5.9%,¹ including vascular access damage, embolic events, and pericardial effusion. Few reports concern mechanical damage during the procedure like entrapped and fractured leads in the mitral apparatus and even fewer cases describe the entrapment of catheters in the PV which were removed by rotational manoeuvres without lead fracture.^{2,3} In our case, the multiple attempts and use of a snare catheter were unsuccessful to dislodge the broken lead tip and the foreign material was left in the pulmonary vasculature (Figure 1). This potential complication of PVI with an ACHIEVE® catheter during cryoablation has to our knowledge not been reported yet. We have weighed the invasiveness and the potential morbidity of a surgical withdrawal set against a conservative attitude and oral anticoagulation with VKA. The final decision was to leave the catheter tip stuck in the PV, without any hard data in favour of this decision. The duration of oral anticoagulation remains challenging. Our case report illustrates these potential complications of using the distal tip of the ACHIEVE® catheter as a support for the cryoballoon during

PV intubation. In fact the ACHIEVE® tip can be inserted far in the distal pulmonary branches with consequently dissection or spasm leading to potential entrapment and fracture.

Conflict of interest: none declared.

References

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