

Circular Air-Filled Space in the Aortic Knob:

A Rare Radiologic Finding

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A 70-year-old man with a history of orthotopic heart transplantation developed severe coronary allograft vasculopathy and presented with cardiogenic shock. He was resuscitated, and both inotropic and vasopressor support were initiated. Subsequently, an intra-aortic balloon pump (IABP) was inserted for further hemodynamic support. After 4 weeks, the IABP was moved from the common femoral artery to the left axillary artery, to motivate the patient to exercise and enable him to sit up in bed. The procedure was performed in the hybrid suite under fluoroscopic guidance. The left axillary artery was surgically exposed, and a 6-mm Vascutek® Gelweave™ graft (Vascutek Ltd., a Terumo company; Renfrewshire, Scotland) was anastomosed as a conduit. Routine postoperative subclavian IABP management included twice-weekly chest radiographs to monitor for possible device migration, and daily examination of the patient's left hand and left radial artery pulse. A portable chest radiograph in the anteroposterior view revealed an unusual, circular, air-filled space in the aortic knob (transverse aorta) (Fig. 1). This finding resulted from the coincidental “end-on” image acquisition of the inflated and malpositioned IABP that had migrated proximally to the transverse aorta.

Comment

The IABP is frequently used for mechanical support in cardiac procedures.¹ Transfemoral artery insertion, the traditional approach, might be contraindicated in patients with severe atherosclerosis of the iliofemoral arteries or the aorta, and in patients with aortobifemoral bypass grafts. Alternative approaches are insertion through the transaxillary artery,² the transbrachial artery,^{3,4} or through grafts to the ascending aorta.⁵ Mayer⁶ was the first to describe the trans-subclavian artery insertion of an IABP; McBride and colleagues⁷ subsequently described a simplified technique.

This radiologic image conveys a teaching and educational message of a very rare finding that was captured incidentally. The finding is unusual because the balloon, while turning from the left subclavian artery into the descending thoracic aorta, displayed an anteroposterior curve, creating a circular air-filled space in the aortic knob—a cross-section of the balloon, captured during inflation. This chest radio-

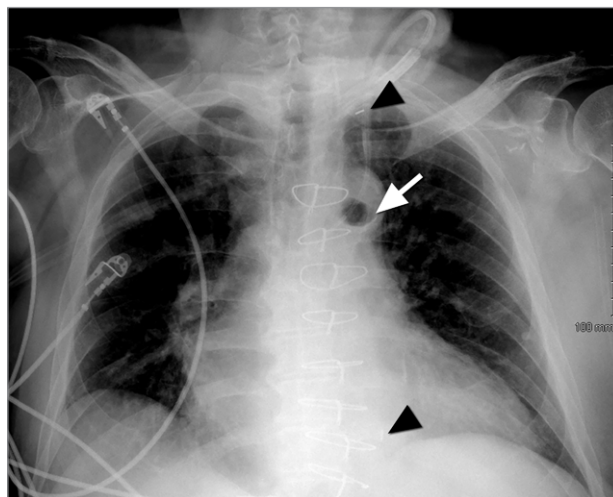


Fig. 1 Chest radiograph (anteroposterior view) shows a circular air-filled space in the aortic knob (arrow). Arrowheads point to the intra-aortic balloon pump radiopaque markers.

graph shows an important sign of inappropriate IABP positioning in the transverse aorta that would be captured only upon the coincidence of image acquisition during balloon inflation. This image would not have been acquired if the IABP had been appropriately placed in the descending thoracic aorta distal to the origin of the left subclavian artery, so that the IABP contour remained relatively straight.

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