CASE REPORT

Angioplasty Balloon Rupture: a Way Round the Embolised Fragment

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Introduction

Circumferential rupture of angioplasty balloons and embolisation of balloon fragments are recognised complications of percutaneous transluminal angioplasty (PTA). If the embolised balloon fragment is left in the vessel, thrombotic occlusion may occur, requiring surgical intervention. We describe subintimal angioplasty as a percutaneous method of restoring vessel patency.

Case Report

An 83-year-old male non-insulin dependent diabetic presented with rest pain, chronic ulceration, cellulitis and gangrene of the left great toe. Angiography demonstrated stenotic disease in the distal superficial femoral artery (SFA). The popliteal artery was patent with two vessel run-off. Local amputation was planned, following angioplasty of the SFA stenoses to facilitate healing. A 6-French sheath was inserted via a left anterograde common femoral artery puncture and a 6 mm by 4 cm Ultra-thin, balloon catheter (Medi-tech/Boston Scientific, Watertown, Massachusetts) was used to successfully dilate two stenoses in the SFA with good results. On attempting to dilate a further calcified eccentric stenosis, the balloon burst at 6 atmospheres of pressure (normal burst pressure 12 atms). Whilst withdrawing the balloon catheter, some resistance was felt requiring reasonable force to overcome it. On examination of the balloon, a circumferential tear was noted and part of the distal fragment was missing.

Further images demonstrated angular flow disturbance consistent with the presence of an intraluminal balloon fragment (Fig. 1a). Despite these findings, the distal circulation was not compromised and an active decision was made to anticoagulate and observe the patient. However, over the next 24 h the foot became ischaemic and the popliteal pulse became monophasic on Doppler assessment.

Repeat angiography demonstrated a 3 cm left SFA occlusion at the site of balloon rupture around the retained fragment (Fig. 1b). Aspiration via a 6F guide catheter was performed and although some thrombus was obtained, the artery could not be completely cleared. Subintimal PTA was carried out (method as described by London et al.3, whereby a guide-wire and catheter were used to deliberately create a sub-intimal tract, which was then dilated with a 6 mm by 4 cm balloon catheter to bypass the occlusion; a good result was achieved (Fig. 1c). The patient remained anticoagulated following the procedure and there was a good clinical response. The SFA remained patent on duplex scanning, with restoration of the dorsalis pedis pulse. The patient subsequently underwent elective local amputation. On review 2 months later, the wounds were healing well and the patient was asymptomatic. The patient died of unrelated causes 2 months later.

Discussion

Rupture of angioplasty balloons is a recognised complication of PTA, but circumferential rupture is more unusual. It has been suggested that rupture is more common at low pressure when the stenosis is heavily calcified. Various methods of catheter retrieval have been described following balloon rupture, including

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the use of a sheath and more recently using a goose neck snare.

When retention of a fragment occurs following balloon rupture, surgical intervention may often be required to retrieve the fragment or to bypass the stenosis. Successful percutaneous retrieval of balloon fragments has been described using endoscopic biopsy forceps, grasping forceps and a basket.

Immediate retrieval of the fragment by one of these methods may have been successful, and in retrospect should perhaps have been performed. However, at 24 h the fragment had resulted in thrombotic occlusion, making removal more difficult. Subintimal angioplasty is an accepted percutaneous method of bypassing occlusions and was carried out using the technique described by London et al. A 5F catheter is introduced anterogradely up to the occlusion, the tip of a straight floppy guide-wire is then directed towards the arterial wall and the subintimal space intentionally entered by the wire/catheter combination. Confirmation of position is made by the injection of small volumes of dilute contrast. The wire is then exchanged for a taper-tip J-wire and the wire/catheter combination used to deliberately create a subintimal tract. To re-enter the lumen of the vessel, the J-wire is manipulated to form a large loop and with forward pressure the true arterial lumen is entered. The entire length of the subintimal track is then dilated with a balloon catheter to bypass the occlusion. We used this method to bypass the balloon fragment occlusion and achieved a good angiographic and clinical result. In this case, the patient was able to proceed to planned local ablation, rather than more complex limb salvage.

References


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