

## SHORT REPORT

# Temporary Balloon Catheter Occlusion for Control of Haemorrhage Following Penetrating Axillary Artery Injury

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*Penetrating injuries of the axillary artery are uncommon. Their repair can be difficult in the presence of torrential haemorrhage, which obscures the surgical field. We describe the use of interventional radiology for temporary control of bleeding to facilitate surgical repair in a case of penetrating axillary artery injury.*

*Key Words: Axillary artery injury; Penetrating; Balloon catheter occlusion; Haemorrhage control.*

### Introduction

Axillary artery injuries can be life and limb threatening and can lead to severe disability. The management of penetrating vascular injuries of the thoracic outlet is notorious for a high mortality and difficult surgical access especially in the presence of torrential haemorrhage.<sup>1</sup> We describe a case report of a patient who underwent successful placement of an intra-arterial balloon catheter to control massive haemorrhage from a penetrating left axillary artery injury.

### Case Report

A 33-year-old man presented with a stab injury to the left supraclavicular region. Severe arterial bleeding from the wound was controlled by pressure. The patient was clinically shocked with absent pulses in the left arm and diminished sensation in the left hand.

After resuscitation an emergency left subclavian angiogram was performed by the right femoral approach. This showed disruption of the second part of the axillary artery. The bleeding was controlled by placing a 9 mm × 4 cm Opta angioplasty balloon

catheter (Cordis, Johnson and Johnson, Berkshire, UK) in the distal subclavian artery (Fig. 1).

On surgical exposure there was complete disruption of the axillary artery, because of severe trauma and the subsequent blind compression to control the bleeding. The axillary artery was excised and replaced by a long saphenous vein graft. There was also complete division of the medial trunk of the brachial plexus, which was repaired by primary anastomosis. The time interval from presentation to surgery was 2 h.

The patient did well post operatively with a viable hand, but had reduced sensation in the thumb, index and middle fingers and weakness of the flexor indices.

### Discussion

Although uncommon in the UK, penetrating vascular injuries are more frequent in parts of the world where civilian violence is common with easy access to firearms. Subclavian and axillary vascular injuries can cause fatal haemorrhage. Their management may be extremely challenging, as surgical exposure is difficult especially in the face of massive bleeding.<sup>1</sup>

Angiography is commonly used in patients with 'soft' signs of vascular injury or where the site of injury is unclear.<sup>2</sup>

Our case reports the use of pre-operative angiography to define the site of injury and for temporary placement of intrarterial balloon catheter to provide a

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**Fig. 1.** Angiogram showing extravasation due to injury of second part of axillary artery, with placement of balloon catheter and temporary occlusion in distal subclavian artery.

bloodless field for successful repair of the axillary artery by a vein graft.

The use of temporary balloon occlusion to control bleeding in trauma patients has been reported in pelvic trauma and major aortic injuries.<sup>3,4</sup> A single case has also been reported to control bleeding in blunt axillary artery injury.<sup>5</sup> Apart from trauma patients, temporary balloon catheter occlusion has been used in the subclavian artery to repair damage caused by badly placed catheters.<sup>6,7</sup>

Attempting vascular surgical repair in the presence of torrential bleeding is unrewarding and potentially dangerous. Angiography with balloon occlusion is valuable for the temporary control of bleeding thus providing a bloodless field for surgical repair. The prompt services of a vascular radiologist are essential for this purpose.

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