

# Endovascular Management of Subclavian Artery Injury Due to Hickman Line Insertion in a Patient with Coagulopathy: A Case Report

M Sajid, J Tibbhal, G Hamilton

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## Citation

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## Abstract

Vascular injuries after insertion of a Hickman line in neck are not uncommon. We present a case report of a patient of acute myeloid leukaemia with coagulopathy, who underwent right Hickman line insertion by a radiologist. She sustained a life threatening right subclavian artery injury which was managed by deploying endovascular covered stent. We recommend open surgical technique for Hickman line insertion under these circumstances after correction of coagulopathy.

## CASE HISTORY

A 44 year old female with acute myeloid leukaemia, diagnosed on bone marrow biopsy, was referred for a Hickman line (HL) insertion. She was commenced on chemotherapy five days previously through peripheral intravenous access. Her platelet count was 25 [Normal; 150000-450000 platelets per microliter ( $\times 10^6/\text{liter}$ )], Prothrombin time 23.1 seconds (Normal; 12 seconds), APTT 41.6 seconds (Normal; 19-21 seconds) and INR was 1.8 (Normal; 1). In view of the low platelet count, a HL was inserted in the right internal jugular vein under fluoroscopic guidance by a radiologist.

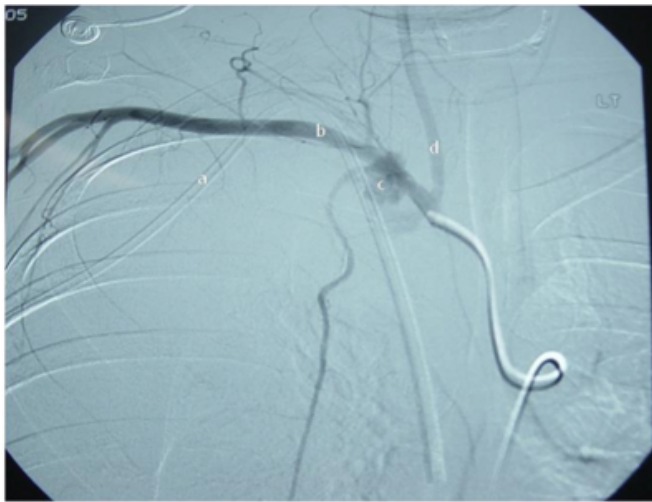
Within three hours of the procedure, she started complaining of right sided chest pain and dyspnoea. Clinical examination revealed that she was in hypovolaemic shock. The right chest was stony dull on percussion with decreased air entry throughout on auscultation. She was resuscitated by putting her on 100% oxygen via face mask after confirming airway patency and adequate breathing (after insertion of right sided chest drain of 24 F). Two size 14F peripheral intravenous lines were inserted immediately and she was given a litre of colloid, four units of red cell concentrate and two units of fresh frozen plasma intravenously over a span of two hours. Chest x-ray showed right sided haemothorax. The chest drain output was more than two litres in the first 30 minutes and it was continuously draining frank blood with a rate of more than 150 ml per hour.

After discussion between the Vascular Surgeon,

Cardiothoracic Surgeon and Interventional Radiologist, the patient underwent a right subclavian artery angiogram. This revealed a puncture in the first part of right subclavian artery just distal to origin of right vertebral artery (Picture 1). Using an endovascular approach a covered Palmaz stent was placed over the puncture site to stop the leak. A post procedural angiogram (Figure 2) confirmed successful covering of leaking segment of right subclavian artery. Patient was kept in the intensive care unit for 24 hours. She recovered well and the chest drain was removed after 48 hours. Her chest x-ray showed normal chest expansion 3 days after procedure.

**Figure 1**

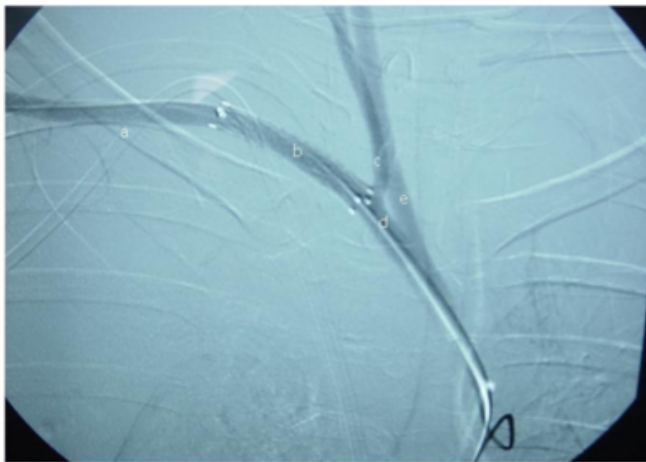
Figure 1: Contrast leak from proximal subclavian artery on angiography



Hickman line, b- Subclavian artery, c- Contrast leak on DSA, d-Vertebral artery

**Figure 2**

Figure 2: Post procedure angiogram



a- Hickman line, b- Endovascular cover stent in situ, c- Patent vertebral artery, d- Subclavian artery, e- Common carotid artery

## DISCUSSION

The use of a covered stent is a safe minimal invasive endovascular procedure, which can be performed under local anaesthetic. On reviewing the literature<sup>1</sup>, arterial injuries treated with endovascular repair were associated with a shorter operative time, less blood loss and, one year patency rates were similar to those following open repair. Schoder et al<sup>2</sup> reported successful deployment of a covered stent with a

complete seal achieved in all cases. Though less invasive, the endovascular procedure is not risk free. Our patient recovered without developing any complication but in the literature about 17 % procedural complication rate has been described<sup>2</sup>. Groin haematoma, transient ischaemic attack and stroke are possible risks. These patients need regular follow up to check stent patency. Clinical assessment by checking brachial blood pressure on both arms is safe and accurate. If there is any doubt, CT angiogram should be taken. Dannetz et al<sup>3</sup> presented series of 46 patients of penetrating injuries of the axillosubclavian artery; about 50% were treated with endovascular techniques. Bartorelli et al<sup>4</sup> presented a case report on two iatrogenic subclavian artery injuries which were both treated by endovascular techniques without endograft occlusion, migration, deformation or fracture during follow up at 12 and 10 months respectively. Subclavian artery injury is a known complication of Hickman line insertion, but actual incidence of this is unknown. In many cases, the injury might be undetected unlike this case, where the coagulation profile was deranged. Therefore, based on our case report, we suggest that in such cases an open surgical insertion of Hickman line with prior correction of coagulation profile (platelet infusion, fresh frozen plasma infusion etc.) is much safer than insertion under fluoroscopic guidance. Trauma related arterial injuries can be managed successfully by endovascular covered stent. Based on our case report, it appears to be an appropriate treatment in comparison to open surgical repair, as it has less complication like decreased blood loss and reduced requirements for anaesthesia.

## CORRESPONDENCE TO

Mr MS Sajid (surgeon1wrh@hotmail.com) Department of Vascular Surgery Royal Free Hospital, Hampstead, London NW3 2QG Ph. +44 207 7940500 & +44 7717852412

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**Author Information**

**M.S. Sajid**

Department of Vascular Surgery & Radiology, Royal Free Hospital

**J. Tibbhal**

Department of Vascular Surgery & Radiology, Royal Free Hospital

**G. Hamilton**

Department of Vascular Surgery & Radiology, Royal Free Hospital