

Case Report

Endovascular Management of Subclavian Artery Injury due to Hickman Line insertion in a patient with coagulopathy

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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 Summary

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 earlier through peripheral intravenous access. Her platelet count was 25×10^3 [Normal; 150000-450000 platelets per microliter ($\times 10^6$ /liter)], Prothrombin time 23.1seconds (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 hypovolaemic shock. Right



Figure1. Contrast leak from proximal subclavian artery on angiography a-Hickman line, b- Subclavian artery, c- Contrast leak on DSA, d-Vertebral artery.



Figure2. Post procedure angiogram a- Hickman line, b- Endovascular cover stent in situ, c- Patent vertebral artery, d- Subclavian artery, e- Common carotid artery.

chest was stony dull on percussion with decreased air entry throughout on auscultation. She was resuscitated with 100% oxygen via face mask after confirming airway patency and insertion of right sided chest drain of 24F. 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. Chest drain output was more than two litres in first 30 minutes followed by continuous drainage of frank blood with a rate of more than 150 ml per hour.

After a discussion between the Vascular Surgeon, Cardiothoracic Surgeon and Interventional Radiologist, the patient underwent a right subclavian artery angiogram, revealed a puncture in first part of right subclavian artery just distal to origin of right vertebral artery (Figure 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 chest drain was removed after 48 hours. Her chest x-ray showed normal chest expansion on 3rd post-procedure day.

Discussion

The use of a covered stent is a safe minimally invasive endovascular procedure, which can be performed under a local anaesthetic. On reviewing the literature¹, arterial injuries treated with endovascular repair were associated with a shorter operative time, less blood loss and one year patency rates. New results were similar to those following open repair. Schoder et al² reported successful deployment of 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, however, literature reports about 17% procedural complication rate.² 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 considered. Dannet et al³ presented series of 46 patients of penetrating injuries of the axillosubclavian artery; 50% were treated with endovascular techniques. Bartorelli et al⁴ 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. 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 complications like decreased blood loss and reduced requirements for anaesthesia. However, in patients with deranged coagulation profile, prior correction followed by open surgical insertion of HL may be safer than insertion under fluoroscopic guidance.

References

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