Successful Treatment of Inadvertent Subclavian Artery Cannulation by Arterial Closure Device

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Learning Points

- Using real-time ultrasound guidance could be a useful tool to avoid subclavian artery cannulation.
- Avoid pull-and-compression method while dealing with inadvertent subclavian artery cannulation, especially in large bore catheter.
- Percutaneous endovascular repair should be considered first priority treatment of inadvertent subclavian artery cannulation in selected patients.
- Endovascular intervention is not free of complications and should beware of possible complications.

Introduction

Central venous catheterization is a common procedure in critical care and major surgeries, but it is not risk free even in experienced hands. Misplacement of catheters has been reported in many possible anatomical positions, including the arterial system, pleura, and other aberrant sites. The mechanical complication rate is up to 34%, including 5% in arterial system.¹ Immediate removal and compression may leads to serious complications, such as bleeding and stroke.² Surgical removal or endovascular treatment is a safer access. Catheter-based approach is a safe alternative treatment for inadvertent subclavian artery cannulation.

Case Presentation

A 54-year-old male patient presented for trans-oral robotic operative management with neck dissection of a left-side stage III hypopharyngeal cancer.

Anesthesia was induced with fentanyl 2ug/kg, 2% xylocaine 1mg/kg, propofol 2 mg/kg and rocuronium 1 mg/kg. A 6.5 Fr endotracheal tube was inserted smoothly and fixed on the right side. After right radial artery cannulation, right subclavian vein access was obtained by using landmark approach with the use of an 18-gauge needle. After non-pulsatile backflow appeared to be venous, an 8-Fr CVC was placed over a guidewire. Pulsatile flow was then observed from the CVC side port, however, indicating inadvertent subclavian artery cannulation. The catheter was left in place and we consulted the cardiovascular surgeon immediately.

Due to difficult surgical approach and high complication risk of bypass, percutaneous treatment was suggested. The puncture site was confirmed by angiography through contrast injection via CVC ([Figure 1A](#)), then percutaneous endovascular repair with arterial closure device was performed by our cardiologist. The Angio-seal VIP 6-Fr system ([St. Jude Medical, Minnetonka, MN, USA](#)) was inserted via the puncture site smoothly and sealed the wound successfully ([Figure 1B](#)). After the intervention, the follow-up CxR showed no hemothorax or pneumothorax ([Figure 1C](#)). The subclavian ultrasound was also performed and revealed well patent and good flow ([Figure 1D](#)). One month later, the computer tomography of the neck tumor also showed well patency of right subclavian artery with the absorption of previous closure device ([Figure 1E-F](#)).

References

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