A case of accidental carotid artery cannulation in a patient for Hemofilter: complication and management

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Inadvertent carotid arterial puncture complication is reported to have an incidence of 2% - 8% 1, 2 and usually results in localised haematoma formation.

**Case presentation**

We present a case of a 72 year old man with acute on chronic renal failure referred for intensive care (ITU) management. History revealed dehydration and anuria for 3 days. His blood pressure was 80/40, sinus tachycardia around 130/min with cold clammy peripheries. Blood investigations revealed urea 23mmol, creatinine 800mmol, and potassium-7.7, with ECG changes of hyperkalemia.

We attempted a right internal jugular (IJV) venous cannulation using landmark technique and inserted an Arrow-Howes central venous catheter with blue flexi tip, 8.5FR, 5 lumen, and 16cm length. The technique was difficult due to low blood pressure, and patient’s inability to lie flat. The ultrasound machine was unavailable at that moment. Soon after the catheter was introduced using seldinger technique, a swelling was noticed from the site of IJV cannulation. The blood sample analysis revealed arterial blood. The catheter was removed and pressure applied for 45 minutes.

Thereafter, a left femoral vein catheter was inserted for central venous access and right femoral vascath –VYGON, DUALYSE Expert, 2 lumen catheter set, 12 fr, 20cm was inserted uneventfully.1 hour later the bleeding from the right carotid puncture site was examined and was found to have ceased. The patient was put on the continuous veno-venous haemofiltration (CVVHF), which clotted after 15 minutes. Heparin was used as an anticoagulant for the filter. This was repeated thrice with same result. Three hours later, a haematoma was noticed in area of IJV puncture, which was gradually increasing in size.

The haematoma spread to the neck and chest after which the patient complained of discomfort with breathing difficulty. In view of increasing airway compromise the patient was transferred to theatre for elective intubation and surgical intervention. Ultrasonography by radiology consultant showed a large haematoma, but unable to see the damage in the vessel and a CT neck, thorax angiography was suggested.

CT angiogram revealed a leak in the bifurcation of the carotid artery. Surgical access was difficult in view of the large persistent leak. Ultrasound probe was used to make the incision superficial to the leak. A small leak was identified in the artery, which was sutured uneventfully. He was then continued on CVVHF with no further complications.

**Discussion**

Complications include arterial puncture, pneumothorax, neck or mediastinal haematoma and hemothorax 3, 4. The haematoma may enlarge rapidly if the patient is coagulopathic, or if a large puncture wound is produced by the introduction of the sheath itself into the carotid artery. Airway obstruction 5, 6, pseudo aneurysm 7, 8, arterio-venous fistula formation 9 and retrograde aortic dissection 10 have all been reported as a consequence of carotid puncture. In the presence of occlusive (atheromatous) carotid disease, inadvertent puncture may carry the risk of precipitating a cerebrovascular accident 11.

NICE guidelines 2002 recommended use of ultrasound for central venous cannulation 12. The Royal College of Radiology...
(RCOR) recommends practical training in vascular ultrasound should involve at least two ultrasound lists per week over less than three months up to 6 months. Meta-analysis including 18 Randomised Controlled Trials by NICE concluded that ultrasonographic (USG) venous catheterisation was more effective than landmark technique for all outcomes 13. Royal College Of Anaesthetists feels guidance is fair and sensible but landmark technique is still an acceptable alternative whether 2D available or not.

**Conclusion**

Complications following central venous cannulation are reduced if the procedure is USG guided and therefore must be used whenever possible. But landmark technique is still an acceptable alternative.

**REFERENCES**


5. Knoblanche GE Respiratory obstruction due to haematoma following internal jugular vein cannulation. Anaesth Intensive Care 7: 286, 1979


