



Our aim is to evaluate the use of open and endovascular techniques for the management of iatrogenic carotid, subclavian, and brachiocephalic arterial injuries related to inadvertent arterial CVC placement” Yoon et al (2015).

Reference:

Yoon, D.Y., Annambhotla, S., Resnick, S.A., Eskandari, M.K. and Rodriguez, H.E. (2015) Inadvertent Arterial Placement of Central Venous Catheters: Diagnostic and Therapeutic Strategies. Annals of Vascular Surgery. August 6th. .

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Abstract:

PURPOSE: Central venous catheterization (CVC) is among the most ubiquitous medical procedures. Inadvertent arterial placement of the catheter presents a challenging dilemma to the interventionalist. Treatment options include: removal and manual compression, off-label use of percutaneous closure devices and/or stent grafts, and open surgical removal. Potential sequelae include bleeding, thrombosis, stroke, limb ischemia, neurologic deficit, and death. Our aim is to evaluate the use of open and endovascular techniques for the management of iatrogenic carotid, subclavian, and brachiocephalic arterial injuries related to inadvertent arterial CVC placement.

METHODS: Retrospective chart review revealed 13 patients with iatrogenic arterial injuries related to inadvertent arterial CVC placement over a 5-year period at Northwestern Memorial Hospital using CPT codes and interventional radiology and vascular databases. Presenting features, radiographic diagnosis, therapeutic maneuvers and outcomes were reviewed.

RESULTS: Endovascular therapy was instituted in 10 cases with 3 requiring an adjunctive open procedure. In the endovascular therapy group, stent grafts were used in 5 patients and 4 patients were managed with percutaneous closure devices. In one patient, multiple embolization procedures were performed in an attempt to close a large innominate artery AV fistula that ultimately required sternotomy and surgical ligation for complete closure. Primary open repair was carried out in 3 patients. Two patients developed embolic stroke prior to therapy and removal, with one death reported at 36 months follow-up. Overall success rate with a single intervention was 100% (4/4) with closure devices, 80% (4/5) covered stents, 0% (0/1) with embolization, and 100% (3/3) with open intervention. Overall complication rate was 7% (1/13) requiring further open, invasive intervention.

CONCLUSIONS: Management of carotid, subclavian, and brachiocephalic arterial injuries from attempted jugular or subclavian venous cannulation can be challenging. The risk of embolic phenomenon associated with arterial catheterization, and the non-compressible anatomic location at the base of the neck frequently prevent simple removal. We employ a strategy of immediate CT or MR to facilitate the most appropriate therapy. Endovascular treatment with covered stent grafts, percutaneous closure devices, and embolization offer good results when selected appropriately based on imaging evaluation. However, more complex cases with associated pseudoaneurysms and/or AV fistulas with larger catheters may require definitive open repair.

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