

# IR vs OR: Chest Port Insertion Outcomes and Complications

Daniela Garcia MD, Michael McGarry MD  
Mercy Catholic Medical Center / Interventional Radiology Department  
Darby, PA

Implanted chest port is the gold standard for chemotherapy and immunotherapy delivery. Successful implantation requires technical expertise and availability of surgery and interventional radiology teams. The purpose of this study is to identify technical characteristics and complications between IR and OR implanted ports.

## Material and Methods

A retrospective, single-institution EMR review was done identifying exam and CPT codes associated with port insertion, revision, and removal performed in the Interventional Radiology suite and operating room between January 2017 and October 2020. Demographic indicators included age and gender, as well as type of cancer and immunologic disease. Venous access type, laterality, and final positioning of catheter tip were reviewed from intraprocedural image records available in PACS. Fluoroscopy time, catheter duration, immediate and late complications were also evaluated.

## Results

A total of 204 chest ports and 1 upper extremity port were implanted between January 2017 and October 2020 in our institution. Out of the total, 104 were placed in the operating room and 101 were placed in the Interventional Radiology suite. The average age of OR placed ports was 63.86 years +/- 11.40 SD (52% female and 52% male) and IR placed ports was 65.77 years +/- 9.55 SD (59% female and 42% male). Patients presented with chemotherapy indication for the following neoplasms: colon, breast, gastric, cholangiocarcinoma, pancreas, esophageal, renal, gynecological, prostate, leukemia, lymphoma, multiple myeloma, and one patient presented with myasthenia gravis. The most common access site was right jugular vein (OR 48,5% vs IR 100%); and the final positioning of catheter tip was middle third of superior vena cava and cavoatrial junction, respectively (OR 43% vs IR 100%).

Fluoroscopy time was significantly longer for OR-placed ports compared to IR-placed ports (1.18 min vs 0.73 min;  $t$  2.82,  $p < 0.05$ ). The number of malposition catheter requiring removal/exchange and fibrin sheath stripping (8 OR vs 1 IR) was higher in the OR group compared to the IR group. Two patients developed immediate postprocedural pneumothorax and carotid artery injury (Fig. 1) from the OR port group and no immediate complications were identified in the IR group.

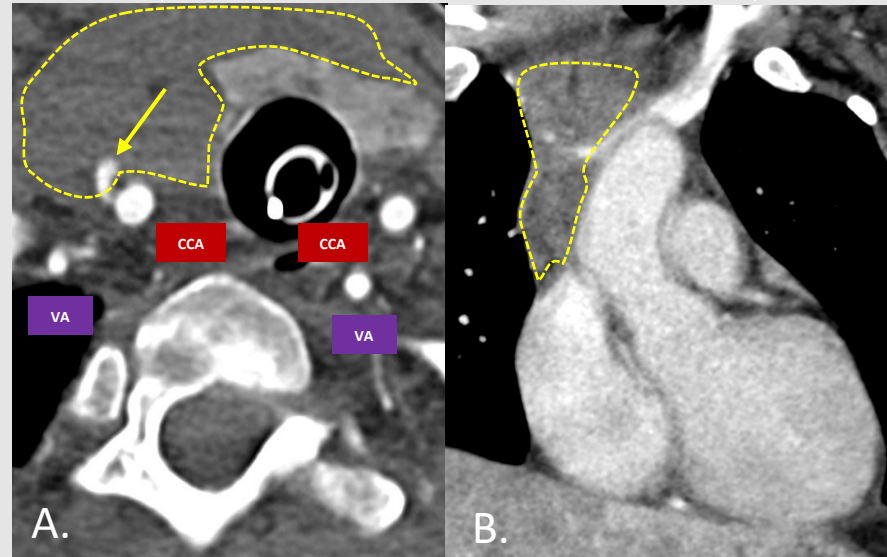
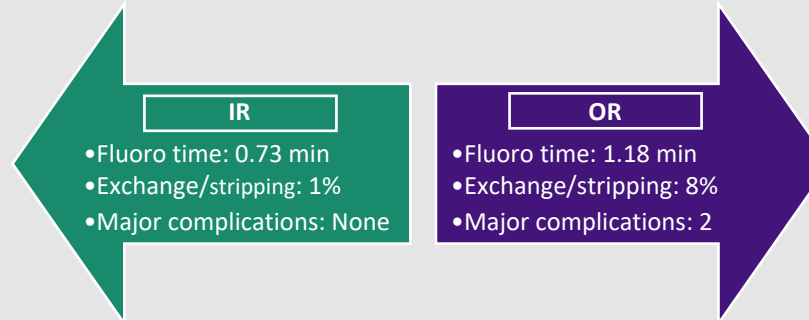


Figure 1. 44-year-old female with recent diagnosis of metastatic colon cancer, scheduled for surgical chest port placement prior to initiation of chemotherapy. Intra-procedural arterial access with brisk pulsatile blood after dilator removal was noted and hemoptysis. A. Axial view Chest CTA shows focal area of extravasation in the right common carotid artery (arrow) with ill-defined collection causing mass effect on the trachea and thyroid (dashed line). B. Coronal view shows hyperdense collection tracking into the mediastinum consistent with hematoma (dashed line). The patient was emergently transferred to a tertiary center for stent placement.

CCA: Common carotid artery  
VA: Vertebral artery

## Conclusions

Optimizing surgical techniques and intra-procedural protocols for implantable chest ports is necessary to improve patient safety and outcomes. Moreover, recent studies have demonstrated that port placement in the interventional suite presents a more cost-effective resource than the operating room.

## References:

- LaRoy JR, White SB, Jayakrishnan T, et al. Cost and Morbidity Analysis of Chest Port Insertion: Interventional Radiology Suite Versus Operating Room. *J Am Coll Radiol.* 2015;12(6):563-571.
- Martin B, Witrick B, Sivaraj B, et al. Interventional Radiologists Achieve Equivalent Outcomes and Lower Costs for Totally Implantable Venous Access Device Placement Compared to Operating Room Placement. *J Vasc Interv Radiol.* 2022;33(10):1184-1190.

Correspondence to:

Email: [Daniela.Garcia@mercyhealth.org](mailto:Daniela.Garcia@mercyhealth.org)

Twitter: @EllaRad\_MD

Figure 1.