



**INTRAMEDULLARY MALPOSITION OF A SUBCLAVIAN PORT CATHETER: A
UNIQUE CASE REPORT**

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ABSTRACT

Central venous port systems provide reliable long-term venous access for chemotherapy in oncology patients, with generally low complication rates. We report an unprecedented case of a 55-year-old man with metastatic gastric cancer who experienced an **intramedullary malposition** of a subclavian port catheter. One week post-implantation, a routine computed tomography (CT) scan revealed the catheter track entering the medullary cavity of a thoracic vertebral body. Remarkably, the patient was asymptomatic, and port function was initially preserved. The malpositioned port was removed and a new port was placed correctly without further incident. This represents the first description of an intramedullary catheter malposition, a complication not previously documented in the literature. We discuss the epidemiology of central venous port use, known complications and malposition sites, and the possible pathogenesis of this rare mishap. Emphasis is placed on adherence to current guidelines for port placement including ultrasound guidance and tip confirmation at the cavoatrial junction to prevent malposition. The discussion also outlines management strategies for catheter misplacements and highlights the importance of prompt imaging when malposition is suspected, even in the absence of symptoms. This case underlines that while central venous ports are safe and effective, vigilance for rare complications is warranted. Early identification and correction of malposition can avert potentially serious sequelae and ensure safe chemotherapy delivery.

KEYWORDS: Central Venous Catheters; Infusion Port; Catheter Malposition; Gastric Neoplasms; Iatrogenic Complications; Case Report.

INTRODUCTION

Totally implantable central venous ports have become standard for patients requiring long-term intravenous therapy, particularly in oncology. First introduced in 1982, port devices are increasingly utilized to administer chemotherapy, parenteral nutrition, and other infusions in a safe and controlled manner. Advantages of implanted ports include reduced infection risk compared to external catheters and improved patient quality of life. However, proper placement and maintenance of these devices are critical, as complications can occur in up to one-third of cases. Common complications include infection and thrombosis, as well as mechanical issues such as catheter occlusion or fracture (e.g., pinch-off syndrome in subclavian placements).^[1] Early procedural complications (within 30 days) are less frequent but can be serious; these encompass pneumothorax, arterial injury, and catheter malposition.

Catheter malposition refers to an improper catheter tip location outside the ideal distal superior vena cava (SVC) cavo-atrial junction region. The reported incidence of malposition at port insertion ranges from about 0.3% to 6%, with higher risk observed when using left-sided approaches due to anatomical angulation.^[2] Malpositions may occur in virtually any anatomical site if the guidewire or catheter deviates from the intended path. Published reports have described central lines erroneously placed in arterial circulation (e.g. carotid or subclavian artery), in small collateral veins (internal mammary or vertebral veins), or even in extravascular spaces such as the mediastinum, pleural or pericardial cavities, epidural space, and subarachnoid space.^[3] Extravascular (extra-caval) misplacements like entry into the spinal epidural space are exceedingly rare but have been reported and can lead to serious neurologic sequelae. To our knowledge, **intramedullary**

malposition (catheter coursing within the medullary cavity of a bone) has never been documented in the literature, making the present case unique.

In this report, we present the case of a subclavian port catheter that malpositioned into a vertebral body in a patient with metastatic gastric cancer. We detail the clinical presentation, imaging findings, and successful management. A brief review of relevant literature and current guidelines is provided to contextualize this complication. The case underscores the importance of meticulous technique, routine post-placement imaging, and awareness of rare malposition scenarios in central venous port insertion.^[4]

CASE PRESENTATION

A 55-year-old male with metastatic gastric adenocarcinoma was scheduled to start palliative chemotherapy. His medical history included subtotal gastrectomy with liver and peritoneal metastases, and he maintained good performance status. For long-term venous access, a totally implantable subcutaneous port system was selected, with no contraindications. Informed consent was obtained prior to the procedure.

The port (titanium chamber with 8 Fr silicone catheter) was inserted via the right subclavian vein under local anesthesia using ultrasound-guided venipuncture and the Seldinger technique. The catheter was advanced to the presumed distal superior vena cava (SVC) without resistance; aspiration and flushing were normal, and no intraoperative complications occurred. A postoperative chest radiograph appeared satisfactory, showing the catheter tip near the SVC. The patient was discharged the same day.

One week later, during a routine staging CT scan, an abnormal catheter trajectory was noted. The device deviated posteriorly from the expected venous course and entered the osseous structure of the upper thoracic spine. Multiplanar CT reformats confirmed the catheter's path into the medullary cavity of the T1 vertebral body, representing an **intramedullary malposition** (Figures 1 and 2). The patient was asymptomatic, with no pain, neurological deficit, or signs of infection. The finding was incidental and radiologic.

Given the risk of bone injury, infection, and ineffective chemotherapy delivery, urgent revision was indicated. Under fluoroscopic guidance, the catheter was gently withdrawn without complication and replaced via the left internal jugular vein. The new port's tip was confirmed at the cavo-atrial junction. The patient tolerated the procedure well, resumed chemotherapy 48 hours later, and follow-up imaging verified correct positioning. At three months, the port remained functional, and no further complications

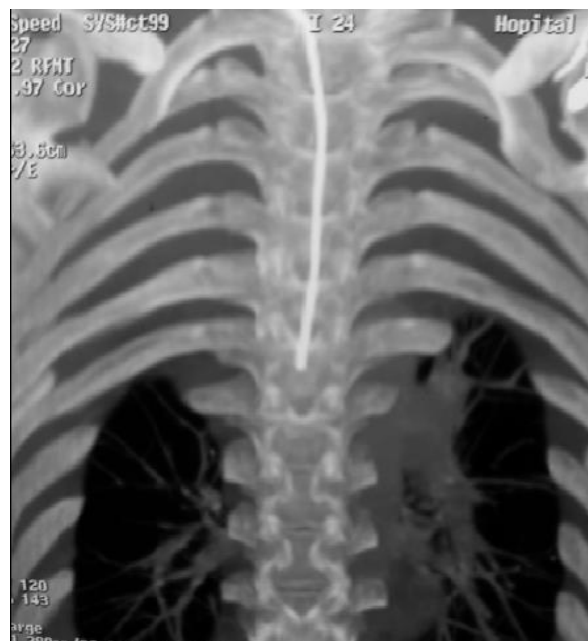


Figure 1: Coronal reformatted CT image of the chest showing the implantable port catheter (arrow) coursing aberrantly into the T1 vertebral body. The catheter track is visible within the medullary cavity of the bone, indicating intramedullary malposition. The port chamber is seen in the right anterior chest wall subcutaneous tissue.



Figure 2: Sagittal CT reformat demonstrating the catheter (arrow) entering the vertebral body. The tip of the catheter is lodged within the spongiosa of T1 vertebra, just posterior to the subclavian vein's normal course. No contrast extravasation or adjacent tissue injury is evident. The unusual path of the catheter highlights the rarity of this complication.

DISCUSSION

This case presents an exceptionally rare complication of central venous port placement **intramedullary malposition of a catheter within a vertebral body**. Normally, central venous catheters terminate in the distal superior vena cava near the right atrial junction to ensure safe hemodilution of infusates. Malposition, defined as deviation from this ideal site, may occur in various forms. Intravascular malposition places the tip in another vessel, such as the contralateral brachiocephalic, internal jugular, azygos, or inferior vena cava, while *extravascular malposition* involves passage outside the venous system into the pleura, mediastinum, pericardium, thoracic duct, or epidural space. These extravascular placements are especially dangerous and may result in severe morbidity from drug extravasation.^[3-4]

The reported incidence of catheter malposition during port implantation is up to 5%, influenced by venous anomalies, technical difficulty, or patient factors such as obesity or short neck. Left-sided approaches pose greater risk due to sharper venous angulation. In this right-sided case, the likely mechanism was posterior venous wall perforation during dilation, allowing entry into the T1 vertebral body. The absence of symptoms suggests minimal structural injury, consistent with previously silent extravascular malpositions.^[4]

In patients with central lines, clinical signs such as poor blood aspiration, resistance during infusion, unexplained pain, swelling, or neurological symptoms should raise suspicion for catheter malposition or related complications. Differential diagnoses include catheter occlusion from thrombus or fibrin sheath, tip abutment against a vessel wall, pinch-off syndrome, arterial cannulation, or extravasation of infusate. In this case, the port remained fully functional and the patient was asymptomatic, illustrating that malposition may be entirely occult. Detection through routine CT underscores that imaging can reveal silent but potentially hazardous misplacements that, if undiagnosed, could lead to severe injury from extravasation of vesicant chemotherapy into bone or epidural space, as documented in previous cases.^[5]

Optimal management requires confirmation of tip location immediately after port placement, typically by fluoroscopy or chest radiography. Single-view X-rays may miss certain malpositions, necessitating CT or contrast studies when doubt persists.^[6] Once identified, correction depends on site and timing: some intravascular malpositions can be repositioned with guidewire manipulation or patient posture adjustments, whereas extravascular misplacements should prompt immediate removal to prevent tissue damage. In this patient, safe extraction and reinsertion at a new site under full imaging guidance ensured optimal catheter function without complications.^[7]

This rare complication underscores the importance of meticulous technique and strict adherence to established guidelines. Current recommendations from major societies advocate ultrasound-guided venipuncture and verification of catheter tip position at the cavoatrial junction using fluoroscopy, intracavitary ECG, or post-procedural imaging.^[8] Ultrasound significantly decreases mechanical errors such as arterial puncture and ensures proper guidewire trajectory. Clinicians must remain alert to resistance, anatomical variations, or atypical catheter paths on imaging, which may indicate malposition.^[9] Routine post-insertion chest radiography, preferably with two projections or contrast study, remains a cost-effective screening tool. The right internal jugular approach is generally safer due to its straight path to the SVC, whereas subclavian access carries higher mechanical risks.^[10]

This first reported intramedullary port malposition highlights that misdirection can occur even in asymptomatic patients. Vigilant imaging confirmation and case reporting are crucial to improving procedural safety and clinical education.

CONCLUSION

Central venous port placement is an essential and routine procedure in oncology, yet even experienced operators must remain alert to rare complications. This report documents an unprecedented event intramedullary malposition of a chemotherapy port catheter — in a patient with metastatic gastric cancer. The catheter inadvertently perforated the subclavian vein and entered a thoracic vertebral body, a location not previously described. Fortunately, the anomaly was detected incidentally on imaging before chemotherapy administration, and the device was safely replaced.

This case reinforces key clinical lessons: (1) always confirm catheter tip placement at the cavoatrial junction using appropriate imaging modalities; (2) remain vigilant for malposition signs, even in asymptomatic patients; (3) strictly adhere to ultrasound-guided venipuncture and fluoroscopic or ECG-guided verification during insertion; and (4) if malposition is detected, immediately suspend port use and proceed with guided repositioning or removal.

Although totally implantable ports are safe and effective, this case underscores that unusual complications can occur. Rigorous post-procedure verification and prompt corrective action are paramount to ensuring patient safety and effective chemotherapy delivery.

REFERENCES

1. Machat, S., Eisenhuber, E., Pfarl, G., Stübler, J., Koelblinger, C., Zacherl, J., & Schima, W. (2019). Complications of central venous port systems: a pictorial review. *Insights into Imaging*, 10(1): 86.
2. Guo, L., Li, Z., Luo, B., & Bai, Y. (2025). Early identification and rapid repositioning of a

- malpositioned infusion port catheter: A case report. *Medicine (Baltimore)*, 104(18): 104(16):p e42126, April 18, 2025.
3. Wang, L., Liu, Z. S., & Wang, C. A. (2016). Malposition of central venous catheter: Presentation and management. *Chinese Medical Journal*, 129(2): 227–234.
 4. Callick, J. et al. (2023). Misplacement of an internal jugular chemo-port into the epidural space. *ACS Case Reviews in Surgery*, Case 8 May 2023; 4(1): 1-5.
 5. Tang, S., Yang, J., Wen, P., et al. (2025). Infusion port catheter tip malposition in a breast cancer patient: Case report and literature review. *Medicine*, 104(? Suppl): eXXXX.
 6. Machat, S., Stübler, J., & Schima, W. (2019). Central venous port placement: Imaging techniques and complications. *Journal of Clinical Imaging Science*, 9: 48.
 7. Schummer, W., Schummer, C., Rose, N., & Eichfeld, U. (2007). Mechanical complications and malposition of central venous cannulations by experienced operators. *Chinese Medical Journal*, 120(23): 2012–2015.
 8. La Barbera, F., Verde, F., Conti, A., Foti, PV., & Basile, A. (2019). Central venous catheter misplaced in the epidural space: A rare complication. *BMJ Case Reports*, 12(4): e229295.
 9. Kato, N., Naito, Y., Ito, K., et al. (2023). Guidelines for central venous port placement and management (abridged translation of the Japanese version). *Interventional Radiology*, 8(2): 105–117.
 10. Machat, S., Eisenhuber, E., Pfarl, G., et al. (2019). Imaging of central venous port complications: malposition and more. *Memo – Magazine of European Medical Oncology*, 12(2): 188–193.