International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 03 Issue 01 January 2023

Page No: 07-10

DOI: https://doi.org/10.47191/ijpbms/v3-i1-02, Impact Factor: 5.542

An Uncommon Case Report of a Punctured SVC through a Chemo Port

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ABSTRACT

Chemo port implantation has enhanced the quality of life for cancer patients. Interventional radiologists or surgeons may implant chemo ports via the Internal Jugular Vein (IJV) or Subclavian Vein (SCV). A central catheter that is implanted into the central venous system is connected to a port chamber (subcutaneous) to form a venous port system. The catheter chamber's subcutaneous position enhances the patient quality of life and has a lower infection rate than non-totally implanted central venous devices. To avoid both immediate and long-term difficulties, a port system must be implanted, used, and cared for properly. Pneumothorax, hemothorax, thoracic duct damage, cardiac tamponade, venous malpositioning of the catheter, and perforation with arterial injury are the most frequent early complications (30 days). Infection, catheter thrombosis, vascular thrombosis and stenosis, catheter fracture with extravasation, or fracture with migration or catheter material embolization, are examples of delayed problems. To detect potential issues and-plan therapeutic interventions, such as in the event of catheter migration, radiologic imaging has become more important in both intra-procedural assessment and postoperative follow-up.

KEYWORDS: Chemoport, Internal jugular vein, Subclavian vein

ARTICLE DETAILS

Published On:
24 January 2023

Available on:
https://ijpbms.com/

INTRODUCTION

Intravenous access is a significant problem for cancer patients undergoing long term chemotherapy or with poor venous access. For such patients, chemo port insertion is preferable over intravenous (IV) access to avoid adverse side effects from numerous venepunctures, and extravasation of toxic chemotherapeutic medicines, and to enhance the quality of life (QOL) [1]. In 1982 Niederhuber and colleagues surgically implanted chemo port for the first time [2]. Internal jugular vein (IJV) or subclavian vein (SCV) are the two most frequent locations for Chemoport insertion [3].

Due to the implanted subcutaneous chamber's direct connection to the central vein through a catheter,patient escapes from repeated venepunctures. The entire assembly continues to be buried beneath the skin, which increases patient compliance. Under imaging guidance, it is often implanted by a surgeon or interventional radiologist.Once the venous device has been implanted, a chest radiograph should be taken to ensure proper location or to look for any potential early issues. Of course, even after trouble-free implantation, regular catheter upkeep is required to prevent problems, which are recorded in as many as 27% of cases [4]. Less disruption of everyday activities, less frequent flushing, and a lower chance of infection are advantages of chemoport. Whereas, requirement for needle insertion, greater discomfort, and the possibility of extravasation are drawbacks In port systems implanted in the IJV or the SCV, it has been recommended that the catheter tip be placed in the distal superior vena cava (SVC), as the large volume of blood in a

wide calibre vein immediately dilutes administered medication and lowers the risk of vascular damage. This is crucial for chemotherapy medications because they are given as high osmolality solutions. Suboptimal tip location may result in delayed consequences because they are known to harm the vascular wall, which may lead to issues like infection, thrombotic occlusion, and narrowing of the venous diameter [5].

CASE PRESENTATION

61 year old patient with recurrent ovarian carcinoma, underwent a total of 47 cycles of chemotherapy from 26 March 2010 to 23 July 2020. In July 2020, while the patient was undergoing palliative chemotherapy (third cycle of 8-week treatment) she developed Port infection. The right ijv port was removed, and a subclavian port was placed in its place. Upto September 2021, the patient underwent additional 10 cycles of chemotherapy comfortably via the subclavian port. Following that regular monthly port flushing on three occasions, the patient experienced chest pain that would occasionally radiate to her shoulders and back.

Whole-body PET scan was performed to assess the patient's disease status and rule out any thrombosis at the port site.

In accordance with the CT scan, the catheter tip was outside the SVC and there was a minor eccentric thrombus along the wall. The distal portion of the port was shown having an extraluminal course in the superior mediastinum with its tip in the precaval area, contacting the anterior wall of the superior vena cava (fig). As the patient was clinically stable, a portogram was recommended. A thin irregular loculated collection of the contrast was found in the anterosuperior mediastinum on the right, abutting the anterior wall of the SVC and the right lateral wall of the ascending aorta, after the injection of 2 cc of iodinated contrast and saline through the port (fig). Even though the port had punctured the SVC, a highly uncommon occurrence, the patient was stable.

A need for port removal was explained to the patient. After receiving informed consent for thoracotomy, the chemo port was successfully removed. On the operating table, the patient was monitored for any signs of hemodynamic instability for 20 minutes. After the Left Subclavian port was removed, compression was administered for 20 minutes, and the site was sutured with Absorbable suture. The Right Internal Jugular Vein was then accessible, the port was introduced successfully under ultrasound and fluoroscopic supervision and haemostasis was obtained. Despite that there were no complications, and the vitals of the patients were stable.

DISCUSSION

In comparison to penetrating trauma, central venous catheterizations and erosions are more typical sources of injury to the innominate-superior vena cava (SVC) confluence [6]. However, compared to the more frequent consequences like pneumothorax, infection, and intravascular thrombosis, these complications of catheter implantation are rather uncommon [6-8].

The pericardial and pleural spaces are close to the innominate-SVC junction. If detected early and the catheter removed quickly, a localised central line puncture inside the mediastinal pleura may not result in major problems [6]. However, hydrothorax communicates with the pleural space if the perforation is missed. Usually, the side of the chest opposite the central line placement is where the hydrothorax is located. It might be bilateral in some circumstances. Heart tamponade brought on by an acute perforation of the innominate-SVC junction might cause abrupt hemodynamic decompensation [6-8]. The insertion of a central line into the internal jugular vein is a popular method for gaining venous access to a chemotherapy port. A very uncommon complication is mediastinal hematoma brought on by vascular injury near the mediastinum and necessitating an emergency thoracotomy because of hemodynamic instability[9]. Only a few case reports have it documented in the literature. In a case report from 2011 by Gupta et al [10]., they cited 8 instances of mediastinal hematoma following central line insertion [10]. An instance of mediastinal hematoma was documented by Arik et al. [11] following the placement of a left subclavian venous catheter for hemodialysis in a patient with end-stage renal failure. The guide wire probably pierced the subclavian vein, resulting in a haemorrhage that led to a mediastinal hematoma and the patient's eventual death. Forceful manipulation of the dilators or guide wires against resistance is one explanation for how vascular complications are caused.

In a case of hydromediastinum and bilateral hydrothorax following the insertion of a subclavian line in a 28-year-old male with multiple fractures from a car accident, Naguib et al. [12] documented the condition. Malposition is one of the most frequent complications following catheter insertion. Azygous, axillary, internal jugular, and contralateral jugular veins are possible locations for the catheter tip. The tip of a catheter that is too long risks coiling in the right atrium or inferior vena cava. Usually, this complication is avoided by using fluoroscopic guidance. Even if the catheter is put at the patient's bedside, the tip must be evaluated by a chest x-ray. The misplaced catheter must therefore be either adjusted or withdrawn and then reinserted. Repositioning of the same CVAD would seem to be a more appealing alternative than removing and reinserting the CVAD because doing so would require a significant additional surgery and carry inherent risks in individuals who may be immuno-compromised.

Nine catheter-related SVC perforations were described by Tocino and Watanabe. Of the nine patients, eight had left-sided catheters[13]. Similar to this, Duntley and colleagues described a group of eight individuals who experienced vascular perforations as a result of catheter use[14]. Six of these individuals had catheters that "abutted the right lateral wall of the superior vena cava," according to the description of their catheter tips. Seven of these catheters were implanted

from the left side. The clinical signs of vascular perforation in this group of eight patients first appeared 2.9 days and 0.8 hours after catheterization. When introducing the guidewire, an essential complication can happen if too much power is utilised against resistance, especially if a straight or angle tip wire is employed rather than a J tip style wire. The majority of the time, bleeding from a tiny vein puncture will stop on its own due to vasospasm or external tissue compression. But there have been occurrences of fatal hemothorax brought on by the aforementioned problem. Maintaining a high index of suspicion is necessary in these situations when there is an inexplicable decrease in haemoglobin or when a unilateral pleural effusion develops ipsilateral to a newly implanted or attempted central venous catheterization. Inserting a chest tube or performing an emergency thoracotomy may be required for the treatment of a major perforation.

Because the innominate vein creates a right internal jugular vein, catheters put through the left subclavian or internal jugular vein are more likely to cause perforation.The SVC at an angle and a wide angle may be used to put the catheter tip against the lateral wall of the SVC. Perforation may be caused by chemical damage from infused fluids or mechanical stress from the catheter tip (hypertonic or vesicant agents).A range of 1 to 60 days separates catheter implantation from vascular perforation[7].The nearly year-long gap between the catheter placement and the perforation's symptoms (chest discomfort and dyspnea) in our case may have favoured mechanical damage[7,8].But To our knowledge, port piercing SVC is seldom reported and we haven't come across any literature which entails the details about it. The Delayed SVC puncture caused by the port was quite unusual, yet the patient was still stable.

CONCLUSION

The management of central line, dialysis catheter, and chemo port installations call for meticulous surgical skill, knowledge of the potential problems, and close patient monitoring during the perioperative period. In conclusion, any unexplained respiratory worsening should raise concern of catheter erosion.

Chest radiographs taken after procedures help spot difficulties early. didn't understand any major complications but this is unusually a rare phenomenon

Delayed complications can also occur and high degree of clinical suspicion needed to ensure early detection and management

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FIGURES

Figure no 01,02 and 03 depicts PUNCTURED SVC THROUGH CHEMOPORT

Figure no 01.

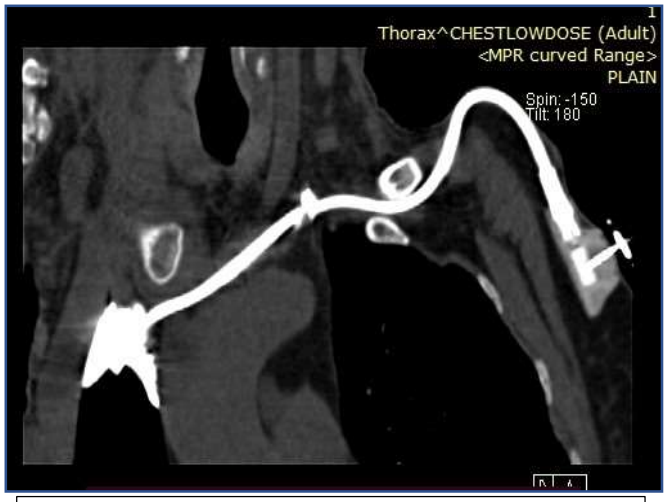

Figure no 02.

Figure no 03.

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