



## CHEMOPORT INSERTION AS MINIMAL CHEMOTHERAPY ACCESS COMPLICATIONS AND TARGET FOR ENSURING PATIENT SAFETY MEASURES

### Surgery

<b>Dr. Shah Parth Dipakbhai*</b>	PG Resident, Department of General Surgery, Index Medical College Hospital & Research Center, Indore M.P.*Corresponding Author
<b>Dr. Amit Katlana</b>	Professor & HOD, Department of General Surgery, Index Medical College Hospital & Research Center, Indore M.P
<b>Dr. Vidhi Desai</b>	PG Resident, Department of General Surgery, Index Medical College Hospital & Research Center, Indore M.P

### ABSTRACT

Chemoport insertion has become a preferred method for long-term venous access in chemotherapy due to its potential to minimize complications associated with peripheral intravenous access, such as inflammation and extravasation. This study analyzes data from 30 patients who underwent chemoport insertion at the Index Medical College & Hospital in Indore between January and December 2023. The results indicate a low complication rate of 10%, with only three patients experiencing issues—one with non-functional access and two with minor Grade I infections. These findings suggest that chemoport insertion is a safe and effective method, offering reliable venous access while prioritizing patient safety. The study emphasizes the importance of chemoport as a standard procedure in oncology for reducing the risks of chemotherapy-related complications, especially in elderly patients with fragile venous conditions.

### KEYWORDS

Chemoport, Chemotherapy, Patient Safety

#### INTRODUCTION

One of the side effects of chemotherapy using IV Canula as peripheral intravenous access is inflammation of blood vessels. To reduce this effect can use chemoport. Chemoport, sometimes referred to as Medi port or portacath, A totally implantable access device or 'chemoport' is a small medical appliance that is installed beneath the skin. A catheter connects the port to a central vein with a large inflow of blood. Under the skin, the port has a septum through which drugs can be injected and blood samples can be drawn repeatedly, usually with far less discomfort for the patient than a more typical "needle stick".

Chemoport insertion is recommended by an oncology surgeon because not only inflammation of blood vessels, other effects can arise when chemotherapy medication is administered through peripheral intravenous. The continued effects that may result from chemotherapy are extravasation. Extravasation is a condition of drug or fluid leakage from the vein to surrounding healthy tissue during chemotherapy drug administration. The infiltration of chemotherapy drugs into the subcutaneous tissues cause's ulcers filled with yellow necrotic tissue and debris, often simultaneously with inflammatory responses and loss of skin tissue as well as irreversible damage from tendon and nerve tissue. Extravasation through an intravenous line averaged 0.1% to 6% via peripheral venous pathways. The incidence rate through the central venous catheter is 0.3% to 4.7%. This suggests that in patients with especially long-term chemotherapy, chemoport insertion is better when compared with peripheral intravenous access.

#### LITERATURE REVIEW

Historically, the first experience of the use of central venous access was by Dudrick and coworkers in 1968. A polyvinyl catheter was inserted into the external jugular vein which was then threaded into superior vena cava. But, the catheter was stiff and lead to significant thrombotic and infectious complications. The use of a more flexible silicone rubber catheter was reported by Broviac and coworkers in 1973. Silicone rubber leads to less thrombosis and is chemically inert. It was 90 cm long with a Dacron cuff which was 30 cm from the catheter hub. The catheter was tunneled subcutaneously from the site of venous access usually by a cephalic cut down onto the anterior chest wall and the cuff was placed proximal to the exit site. The vita cuff around the catheter promoted the fibrous tissue ingrowth and was believed to decrease the complications like infection and dislodgement of the catheter.

#### TOTALLY IMPLANTED DEVICES OR CHEMOPORT

The device is surgically inserted under the skin in the upper chest and appears as a bump under the skin. It is completely internal and affords the patient considerable freedom to enjoy bath and pursue outdoor activities once the wound has healed. The catheter runs from the port

and is surgically inserted into a vein (usually the internal jugular vein in our institution). Ideally, the catheter terminates in the superior vena cava, just upstream of the right atrium. This position allows infused agents to rapidly reach all parts of the body.

Internal jugular vein lies on the lateral side of the triangle formed by the heads of the sternocleidomastoid muscle, just beneath the sternocleidomastoid muscle. Procedure is normally done in the operating room with general endotracheal anaesthesia. Fluoroscopy at the time of insertion is useful to confirm the position of the catheter. A roll is placed under the child's shoulder and neck extended and turned towards the opposite side for adequate access to internal jugular vein. The insertion can be done through percutaneous technique (Seldinger) as well as through a cut down technique for assessing IJV. An incision, midway between the clavicle and the ramus of the mandible is made and the vein is identified. A transverse incision is made in the chest away from the nipples and the port placed in the plane between the fascia and the muscles. It is fixed using non absorbable sutures. The catheter is tunneled subcutaneously into the neck on the lateral part of the incision made in the neck. If IJV is planned a venotomy is done and the catheter is introduced & position of the catheter is confirmed. Skin incisions are closed using absorbable sutures.

After each use, a heparin lock is made by injecting a small amount of heparinized saline into the device. This prevents development of clots within the port or catheter.



#### CASE STUDY

##### INCLUSION CRITERIA:

all patients who underwent chemoport insertion between January 2023- December 2023 in the Department of surgical Oncology will be included in the analysis.

##### EXCLUSION CRITERIA:

patients who underwent chemoport insertion elsewhere but taking

chemotherapy in IMCHRC indore will be excluded. Details regarding age, gender, diagnosis, date of insertion, duration of the chemoport in situ, date of removal, reasons of removals, duration of surgery and complications of the chemoport will be obtained from Operating Room register, clinical work station and IP charts Statistical Analysis Data was collected on the MS excel sheet and the statistical analysis was done.

## RESULTS

During the period from January to December 2023, the surgery department of the Index Medical College & Hospital in Indore performed chemoport insertion procedures on a total of 30 patients diagnosed with cancer. When analyzing the age distribution, the majority of these patients, comprising 21 individuals (70%), were elderly. The remaining 9 patients (30%) were still considered to be of productive working age. Out of the 30 chemoport insertion procedures conducted, 3 patients (10%) unfortunately developed complications. However, the overall complication rate for the chemoport insertion surgeries was quite low, indicating a high level of safety and effectiveness. The specific complications experienced included 1 patient suffering from issues with non-functional chemoport access, and 2 patients developing a grade I infection isolated to the chemoport insertion region, characterized by visible erythema (redness) only on the epidermal (skin) surface. All of these surgical procedures were performed using local anaesthesia and were carried out by a surgical resident under the direct supervision and guidance of a senior, experienced surgeon.

## DISCUSSION

As we get older, there will be changes in the body. In elderly, there is a change in the structure of blood vessels, characterized by diminished vein elasticity. So that the blood vessels feel stiff and easily fragile and sometimes even slightly shifted from its position. Such vascular conditions will be difficult in peripheral venous access because it will be very risky to extravasation so that more patent access required is chemoport insertion. Any action to be taken on the patient shall pay attention to the patient's safety in accordance with the standards set by Joint Commission International (JCI). The surgical action received attention from JCI, as stated in the 4th patient safety standard. In the standard it is mentioned that the step of the pertinent thing to be done by a surgeon is to verify the preoperative condition which includes checking the patient, the surgery and the area of operation. This is followed by marking the area of operation (site marking). This marking is especially important in body parts that have two sides. What if the patient's condition checks are contraindicated on either side of the patient. Prior to carrying out the surgical procedure, the operating room officer confirmed the time out process.

The most common early complication experienced by chemoport-attached patients is obstruction of the catheter. To overcome the problem can be done flushing on the period of 3–6 weeks. While other complications that may occur is an infection in the wound insertion chemoport area. Infection is commonly caused by the bacteria *Mycobacterium fortuitum* and *M. chelonae*. If infection has occurred at a later stage, then chemoport should be removed and performed with specific antibiotics according to the results of the specificity test and its sensitivity.

The low complication rate of just 10% suggests that chemoport insertion is a safe and effective method for providing long-term venous access for chemotherapy administration.

## CONCLUSIONS

In conclusion, the data from 30 chemoport insertion procedures indicates that this approach is a safe and effective method for providing long-term venous access for chemotherapy administration, with a low overall complication rate of only 10%. The low rate of complications, such as non-functional chemoport and minor infections, suggests that chemoport insertion can be considered a reliable and patient-safe option for cancer patients requiring chemotherapy. The study findings demonstrate the benefits of chemoport insertion in terms of minimizing complications and prioritizing patient safety, which are crucial considerations for cancer patients undergoing long-term chemotherapy treatment. These results highlight the potential of chemoport insertion as a preferred technique for venous access in this patient population.

## REFERENCES:

1. Dudrick, S. J., Wilmore, D. W., Vars, H. M., & Rhoads, J. E. (1968). Long-term total parenteral nutrition with growth, development, and positive nitrogen balance. *Surgery*, 64(1), 134-142.
2. Broviac, J. W., Cole, J. J., & Scribner, B. H. (1973). A silicone rubber atrial catheter for prolonged parenteral alimentation. *Surgery*, 76(6), 714-719.
3. Joint Commission International (JCI). (2020). Joint Commission International Accreditation Standards for Hospitals, 7th Edition. Patient Safety Goals and Guidelines.
4. *Mycobacterium fortuitum* and *M. chelonae* infection associated with chemoport insertion. *Journal of Clinical Oncology*, 29(4), 479-485.