

Implantable Vascular Access Port insertion and Management

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Abstract

The device which is used to draw blood and some treatments including intravenous fluids, chemotherapy, blood transfusion and antibiotics therapy. The port should be placed under the skin preferably right side of chest. It is attached to a catheter (a thin, flexible tube) that is guided (threaded) into a large vein above the right side of the heart called the superior vena cava. The medication will be done by inserting a needle to draw blood or give fluids and other treatments. A port may stay in place for many weeks, months, or years. Also called chemo port (port-a-cath).

The main advantage of this vein-access device is that chemotherapy medications can be delivered directly into the port rather than a vein, eliminating the need for needle sticks. It needs to be inserted by specially trained professionals and prepare the patient to keep the chemo port safe with special care in order to prevent complication.

Keywords: Venous Port Catheter; Vein-access Device; Vascular Access Port; Implantable Vascular Access Port; Chemotherapy and Safe handling.

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Introduction

The implantable subcutaneous venous access port or chemo port is a common procedure in patients requiring long-term venous access. Chemoport offers safe, smooth and cosmetically excellent venous access.

A chemotherapy port is a small device that is implanted under the patient's skin to allow easy access to your bloodstream¹. A port may be used to draw blood samples for various diagnostic purpose and administer chemotherapy drugs. Blood and blood components can also be transfused whenever it required.

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In the absence of a port or a PICC line, every time we need to insert new intravenous line for the purpose of chemotherapy, intravenous Fluid infusion or a blood transfusion.

The use of implantable port has grown tremendously since their first use in 1981. Oncology patients were the first recipients of chemo port. The acceptance of these devices has increased rapidly and implantation of ports being more than 100000 each year.

These devices have designed by different manufactures companies in their own type of port, and More than fourteen manufactures companies making this device, still most are similar in design, function and application.

Design of Implanted Ports

The implantable venous access device consists of the portal body and the catheter. The portal body is made of either stainless steel, titanium, polysulfone, or a combination therefore with an inner centre space

called a reservoir. The three principle outside feature of the chemo port. are the base, the shoulder, and the barb².

A self-sealing, compressed silicone septum overlays the portal body². The septum is designed for either top and/or side access². This is done by a chemo port. needle, Huber needle, or a needle with a deflective, non-coring tip².

Indication

Indications for use of implantable ports over use of other central lines are;

- ◆ There is no external component to break.
- ◆ Patients with poor venous status, e.g. Cancer Patients, diabetic, and cystic fibrosis patients who have fragile veins which are difficult to access.
- ◆ Patients with need of long-term venous access.
- ◆ For the Patients who require total parenteral nutrition (TPN), vesicant drugs, chemotherapy and anti-biotics.
- ◆ Administration of pain medicines which are delivered by PCA or CADD pumps needs reliable venous access.
- ◆ Administration of blood products and need for blood draws are facilitated by use of a chemo port.
- ◆ Patients with highly body image concerns, i.e. their body image is not threatened by external Intravenous catheters.
- ◆ Patients who require more mobility (young, active adults).

Advantages

- Greater comfort
- Less delay
- Less risk of extravasation (leakage)
- Less risk of infection when bathing or swimming

Disadvantages

- Surgical procedure needed to place the port.
- Can become infected.
- Can develop a clot in the catheter.
- Could stop working due to mechanical problem.
- Might limit some activities.
- Can leave a scar.

Contraindication

- ◆ Chemo port should not be used when a known infection is present.
- ◆ A patient with too adequate or inadequate body tissue will present a challenge to the use of the chemo port.
- ◆ A chemo port should not be placed in severely neutropenic patients because of their lowered resistance to infection.
- ◆ Patients who has low platelet count are at risk for bleeding during and after operative procedures.

Chemo port insertion

The most common site for insertion of Chemoport is the right Internal jugular vein. In case of right Internal jugular vein is not visible, or small in size, then the next choice was the left Internal jugular vein. The right subclavian vein or the right external jugular vein can be selected in case of thrombosed Internal jugular vein. Chemo port insertion performed in GA and LA. Technique of insertion should be routinely standard.

- ◆ Patient position is supine insert role towel under the shoulder to extend neck.
- ◆ Skin preparation was done with 10% povidone-iodine or chlorhexidine solution and sterile draping was used.
- ◆ Insertion into the entry vein was done with an ultrasound guidance using a 19-G puncture needle³. The angle of the needle should be away from the carotid artery. If the puncture was difficult, a micro puncture set with a 22-G puncture needle and a 0.018" wire was used, and subsequently replaced with a 4-Fr introducer to facilitate transition to a 0.035" system³.
- ◆ Once the entry site was punctured, a guide wire was inserted and the proximal end was secured³. The distal end of the guide wire was ideally placed in the inferior vena cava (IVC)(3).
- ◆ Check the guide wire position in c-arm.
- ◆ The creation of the Chemoport pocket. The most common site for the pocket was at the delto-pectoral region, around 2.5 cm from the clavicle⁴.
- ◆ After the pocket was created, then take sutured in at least two sites to the underlying muscle.
- ◆ The silicone catheter was inserted using a trocar subcutaneously from the pocket to the entry site or vice versa.

- ◆ The tip was measured to reach the cavo-atrial junction.
- ◆ A peel-away sheath was inserted to facilitate the catheter insertion into the venous system. Catheter insertion is done by instructing patient to hold breath or inspiration and pinching of the peel-away sheath to avoid air embolism.
- ◆ The tip was then checked for kinks and optimal positioning by fluoroscopy.
- ◆ Aspiration of blood was done to check its function.
- ◆ Flushing with heparinized saline was done.
- ◆ The port was then closed in two layers using absorbable sutures. Sterile dressings were placed.
- ◆ A post-procedural chest radiograph was taken routinely.

Maintenance

- If no I.V. fluids are infusing chemo port, flush with 10cc NS and 5cc heparin (100 unit/cc) once every 24 hours. Follow facility's policies and procedures.
- If I.V. fluids are infusing, avoid a very slow infusion rate (i.e. 5 ml/hr.) as this could contribute to the development of clots at the end of the internal catheter.
- Do not flush chemo port with heparin 500 units more often than once every eight hours. A thorough flush with NS is acceptable when frequent administration of I.V. medicines is required and the chemo port is heplocked.
- If the chemo port is not being used for infusion of medication or I.V. fluids, the port should be accessed once per month for a terminal flush with 10cc and 5cc heparin (100 units/cc).
(NOTE: Heparin is used to keep blood from clotting in catheter. Once a clot forms, Heparin will not Dissolve the Clot.)

Nurse's responsibilities for I.P

1. Maintaining the function of chemo port is a critically important task.
2. Access/ de-access chemo port.
3. Perform proper flushing technique.
4. Flush by creating a turbulent flow/ scrubbing action thereby clearing out residue.
5. Clamp tubing toward the end of the flushing action.

6. Withdrawal of blood.
 - Flush with 10cc NS and withdraw 3 cc to 5 cc of waste and discard.
 - Draw blood sample.
 - Flush with 10cc NS using proper flushing technique.
 - Continue I.V. fluids as ordered or, if heplocked, flush with 5cc heparin (100 unit/ml).
7. Troubleshoot problems such as cause of occlusions, tipped, edema around chemo port and catheter, and other situations encountered.
8. Assessment of skin integrity at the chemo port site.
9. Perform terminal flush once per month, when the port is not accessed.
10. Make patient familiar with design and function of port.

Documentation

Accessing port documentation

- ◆ Date and time accessing.
- ◆ Appearance of skin over and surrounding port.
- ◆ Whether blood return was positive or negative.

Conclusion

Totally Implantable Vascular Access Port for chemotherapy at present are a safe enough, means for the administration of chemotherapy regiment or other substances, in view of the low number of complications observed.

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