

Introduction

1. A CVAC is a catheter or tube made of synthetic materials, inserted under your skin, into a vein. It is a convenient and relatively pain-free way to give substances intravenously, such as chemotherapeutic agents, antibiotics, intravenous nutrition fluid, and to draw blood via the catheter as well as haemodialysis.
2. There are several types of CVACs such as tunneled catheters (e.g. Hickman's or Broviac's catheters), peripherally inserted central catheters (PICC), dialysis catheters and implantable ports.
3. Without a CVAC, the alternative is to puncture the skin afresh each time blood is to be taken or through siting and simple intravenous catheter which requires changing every 2 - 3 days. When your doctor recommends a CVAC, it is with your best interest in mind. It could make your frequent treatments more comfortable.

The Operation / Procedure

1. The procedure is performed under local anaesthesia using aseptic techniques.
2. Your vital signs (blood pressure, pulse and oxygenation status) will be monitored throughout the entire procedure.
3. A needle is inserted into the vein under image guidance, followed by guidewire.
4. The skin entry site is serially dilated. The catheter is then inserted over the guidewire to the correct position in a central vein.
5. The next step depends on the type of catheter. For a tunneled catheter, a skin tunnel is then created before the skin wound is sutured and the completion of the procedure. For a port, a small subcutaneous site is created to harbour the port before skin is sutured over it. For other catheters, they are sutured to the skin to minimize slippage.
6. You should avoid or minimize any activity that risks the dislodgement of CVAC.
7. The portion of the catheter that is outside your body should be secured with tape.
8. A CVAC may be needed for periods from a few weeks to several years, depending on catheter nature, its condition, clinical circumstances and advice of clinicians.

Before the Operation / Procedure

1. A written consent is required.
2. Inform medical staff before the examination if patient is or may be pregnant as the examination involves high dose of X-ray that is harmful to a foetus. Pregnancy test may be necessary in case of any doubt if the examination is to be proceed.
3. Inform doctor of history of allergy to food and drugs, and in particular any previous reaction to contrast medium, asthma, urticarial, eczema and allergy rhinitis etc. Oral or intravenous steroid premedication may be needed before injection of contrast medium.
4. Keep fasting for 4 hours prior to the examination.
5. For diabetic patients on Metformin medication, patient should inform medical staff before examination.
6. Check clotting profile for any bleeding tendency, to be corrected if abnormality detected.
7. Antibiotic cover prior to examination when necessary.
8. Set up venous access.

Risk and Complication

1. Varies with different catheters and skin entry site, the more frequent complications include:
 - 1.1 Infections.
 - 1.2 Blockage of the CVAC.
 - 1.3 Clotting of the vein.
 - 1.4 Catheter fracture.
 - 1.5 Irregular heart beat.
 - 1.6 Pneumothorax, hemothorax (air, blood accumulated in the space surrounding the lung).
 - 1.7 Venous and adjacent arterial injury.
 - 1.8 Blood clot around the wound.
 2. Other rarer complications include:
 - 2.1 Air embolism (air sucked in through the sheath or wound during catheter insertion, which may cause severe circulatory impairment or death).
 - 2.2 Bleeding.
 - 2.3 Injury to brachial plexus (nerves around the neck or axilla).
 - 2.4 Accumulation of blood in space surrounding the heart, causing circulatory impairment.
 - 2.5 Catheter or port erosion through the skin.
 3. Allergic reaction to intravenous contrast medium.
 - **Mild reactions:** For example, itching, mild skin rash, nausea, vomiting, feeling of warmth, arm pain, sneezing, coughing, etc. These reactions are only temporary and require no treatment.
 - **Moderate reactions:** These are more serious and prolonged. Examples are severe skin rash, fever, chills, palpitation, high or low blood pressure, etc. These reactions usually need medical treatment.
 - **Severe reactions:** These usually require immediate medical treatment and can even cause harm. For example, shortness of breath, irregular heartbeat, chest pain, convulsions, kidney failure, unconsciousness, etc.
 - **Death:** On rare occasion, contrast medium like many other drugs can cause death. The chance of this fatal occurrence resulting from the injection of non-ionic contrast medium is about 1 in 250,000.
 - **Delayed reactions:** Some patients may experience delayed reaction within 24 hours. The symptoms include 'flu' like illness, arm pain, itching, rash, painful or swollen salivary glands, etc.
 4. Pain at injection site during injection of intravenous contrast medium. Contrast medium may accidentally leaks out from the injection site into the soft tissue. Discomfort, swelling or pain may result. Generally, this should disappear within one or two days. Rarely, local skin necrosis has been known to occur as a late complication.
- Should a complication occur, another life-saving procedure or treatment may be required immediately.

Disclaimer

This leaflet only provides general information pertaining to this operation / procedure. While common risks and complications are described, the list is not exhaustive, and the degree of risk could also vary between patients. Please contact your doctor for detailed information and specific enquiry.

Reference

1. The Hong Kong Society of Interventional Radiology Limited, Patient Information Leaflet: Central Venous Access Catheters (CVAC) (2010)
2. Smart Patient Website by Hospital Authority: Percutaneous Venous Catheterization (2013)