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Central peripheral cannulas. Less catheter complications in critically ill patients

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Keywords: intensive care, nurse, PICC

Summary:

Permanent venous access in patients in intensive care plays a key role in the healing process. A routine branches to assume a central venous catheter to the patient is called a vascular access to the central venous line using a venous or long time. An alternative to this type of injection is the circumferential introduction of central venous (PICC - peripherally inserted central catheter) using long catheters placed e.g. a vein shoulder or ulna, which is associated with the lack of such serious complications as pneumothorax or catheter of a large artery, but due to the length of the catheter risk of thromboembolic complications is higher in relation to the central access.

Admission:

Permanent venous access in patients in intensive care plays a key role in the healing process. A routine branches to assume a central venous catheter to the patient is called a vascular access to the central venous line using a venous or long time, which consists of a container with a silicone membrane which can be repeatedly punctured, and the thin-walled intravascular catheter. A port is undeniable convenience for patients and can fulfill its role for many months or even years [1].

An alternative to this type of injection is the circumferential introduction of central venous (PICC - peripherally inserted central catheter) using long catheters placed e.g.. A vein shoulder or ulna, which is associated with the lack of such serious complications as pneumothorax or catheter of a large artery, but due to the length of the catheter risk of thromboembolic events is higher with respect to the central access [2]. Peripherally inserted central catheter (PICC or PIC line), rarely called percutaneous central catheter, is a form of access intravenous, which can be used for a long time, e.g. in the case of long patterns chemotherapy, extended antibiotic therapy or total parenteral nutrition, Or for administration of substances which should not be cut, for example antihypotensive agents, such as pressure switches. It is catheter, which enters the body through the skin (transdermal) in place peripheral It extends to vena cava (Central venous trunk) and remains in place (resident in veins) For a few days or weeks. First reported in 1975. Is an alternative to central venous catheters the main veins, such as subclavian vein, vein internal carotid or femoral vein . Positioning the subclavian and carotid cause pneumothorax (Air in the pleural space of the lung), while PICC lines do not have such problems due to the placement method. PICC placed in vein peripheral arm, such as He lived front or vein arm, and then moved proximally toward the heart by increasing the vein until the end rests on the further the superior vena cava or combined aortic cava. PICC are normally mounted by doctors . physician assistants (USA), radiologists assistants (USA), respiratory therapists, nurse practitioners or specially trained certified nurses and using radiological technicians ultrasound , Chest X-rays and fluoroscopy to help them insert and confirmation of placement. Entering PICC is the procedure sterile But does not require the use of the operating room. After performing at the bedside (it is in the patient's room) must be established and maintained appropriate sterile field throughout the procedure. For this reason, visitors are usually asked to leave the room until the end of insertion, and cleaning the patient's skin, use some form of arrangements skin. PICC inserted portion ranges from 25 to 60 cm in length, which is suitable to achieve the desired position of

the tip in most patients. Some lines are designed to be cut to the desired length prior to insertion; others simply inserted to the desired depth with an excess out. The cable is provided within the conduit leader. This cable is designed to stiffen the line, so it can be threaded through a vein. The wire is removed and discarded after insertion. PICC is also equipped with a "wing" of the holesstitchesor a protective device. Protection prevents catheter movement after insertion of the line, which could otherwise put the tip in a dangerous position.

The Use

PICC can stay *at location* for an extended period of time, from seven days to four months to 12 months, although little information is available in relation to the time profitability. They are used both in the hospital and in the community. PICC may be used for intravenous administration of total parenteral nutrition (TPN), chemotherapy, antibiotics or other drugs and can also be used for blood collection. To keep the patency treatment PICC shall include regular flushing with physiological saline, and the "locking" using heparinor saline when not in use. Type of locking procedure depends on the type of PICC and cork; Gricong PICC have three-way valve at the tip, so the use of heparin lock is not necessary and there is no terminal on the external length. For comparison, Arrow PICC have terminals outside line and require heparin lock. However, the use of heparin to maintain patency of the line is questionable and is now randomized clinical controlled trials investigating it further. Lock heparin are associated with complications, including thrombocytopenia induced heparin. Blood pressure should not be taken shoulder PICC, which is a problem if there are reasons to not take the pressure on the second arm, such as leakage of the dialysis, the absence, casting, infection, removal of lymph nodes, etc. Blood pressure readings on the legs are often 10-20% higher than in the brachial artery. Some types of PICC has recently been approved by the FDA for use in injection force. These types, often referred to as PICC injection capacity, are designed to withstand high pressures related to research contrasting radio. PICC may also be used to measure the central venous pressure Which is a rough estimate of pressure right atrium of the heart and can provide valuable information about the state of the fluid.

Complications

Port intravenous implantation is fraught with risk of complications typical for central venous cannulation. Complications depend on the conditions of perioperative experience of the physician assuming the port arrangement of catheter techniques, product, how it is used and

post-operative care. Barbetakis et al., They analyzed complications in 700 cancer patients who have established a central venous catheters. Complications were divided into early (directly related to catheter implantation) and late (related to the use of ports intravenous). Type occlusion (due to precipitation of the drug or a blood clot) may decide that the drug will be used in an attempt to clean the line to reduce the risk of infection, especially infection of the blood, a person involved in the management of PICC must follow strict infection control procedures.[3]

early complications	late complications
- pneumothorax - hematoma - slow heart rhythm - puncture of the artery - bending the guide - damage to the catheter chamber - bleeding - early infection of the lodge	- thrombosis associated with the presence of a catheter - infection of the catheter chamber bed - catheter narrowing associated with pressure - skin infection - catheter closure - dislocation of the catheter to the pulmonary arteries

Removal

In most cases, removal of PICC is a simple procedure. Generally, the catheter can be safely and quickly removed by a qualified nurse, even at the patient's home, in a few minutes. After removal of the insertion site is usually bandaged with sterile gauze and kept dry for several days, during which can close the wound and initiate the healing. Usually the smaller adhesive bandage can be placed over the area of the wound swabs, if the wound heals slowly. The tip of the catheter is sent to the MCS (culture and sensitivity microscopic) if the patient is systemically unhealthy at the moment of the removal of PICC. In some units, it is sent as a routine investigation.

Legal regulations regarding the use of cannulation and catheter PICC nurses and midwives in the world

PICC (peripherally inserted central catheter)otherwise central catheters introduced with peripheral access, which in modern medicine increasingly are finding their use. This type of cannula used in intensive care units, Hematology and Oncology as well. They are usually placed in the subclavian vein, the internal jugular vein, the external veins armpit, or fractures. Unlike ordinary caniula few days, catheters can be used for a longer period of time. It is noted

that the introduction of a vein catheters shoulder reduces the risk of pneumothorax or of accidental puncture of major vessels. Through PICC catheters are administered medications, fluids, but it is also possible blood samples for basic research. Information on the establishment of the first cannula and intravenous administration attempt any liquid, or medicine dates back to the seventeenth century, the time used cannulas of glass, silver, bird feathers that were designed to cut the skin and injections were made to discount the blood. Numerous animal experiments have also led to note the early complications and contraindications in the use of any cannulation. The first, which effectively conducted peripheral vascular catheterization is Forssmann. The history of central venous access dating back to 1952, when it Aubaniac percutaneous subclavian vein caniulation French soldiers, and the first central cannula described in 1972 Broviac. Since 2007, PICC catheters were introduced. Numerous animal experiments have also led to note the early complications and contraindications in the use of any cannulation.

Indications:

- the need to maintain access for a long time
- Multiple supply chemotherapy drugs and fluids
- parentalne nutrition for patients who do not want or cannot have a port
- frequent blood sampling
- the need to supply fluids hypertonic and hyperosmolar, different pH
- inability to maintain access peripheral
- terminal analgesia
- patients who had rejected the port
- patients with skin changes at the point of entry port
- Temporary vascular access for hemodialysis

Contraindications:

- lack of patient consent
- coagulation disorders, previous surgery, trauma or infection in the area of the planned injection
- restricting the movement of limbs after the PICC
- the state of lymphadenectomy on the side of the implanted PICC
- infection of introduction of the cannula

- burn at the site of the planned introduction of the cannula
- sick, in whom it is planned to produce AV fistula

In order to reduce the possibility of potential mechanical complications during implantation of central venous catheter or later catheter infections and thromboembolic complications treatment should be carried out as planned, in terms of ensuring the operating conditions of surgical sterility. Implant the port should take place first before other operations scheduled for the same room on a given day, you should limit the number of people in the operating room, minimizing their displacement and use laminar flow of air over the operating table.

Preventive measures should focus on relevant, exacting procedures and blocking all roads carrying microorganisms. According to accepted guidelines, intravenous ports supports trained nursing staff. In the centers performing the implantation of ports, and where treatment with their use is normally carried out, it is recommended to create a special consultative points, responsible for preparing the patient for surgery, periodic inspection of the port and the recognition and treatment of complications. Monthly control at the point of the consultation is to assess the patency of the harbor, checking blood reflux, the assessment of the local port chamber implantation site, flushing port heparinized saline and exchange their observations between the patient and medical staff. It is worth noting that on the skin over the port chamber is recommended to use creams, nourishing, moisturizing and instruct the patient not to sunbathe this area of the skin. This is to avoid local complications, such as rupture of the skin, local infection, skin necrosis. [12]

Education, training and personnel management - Legal Page:1

In order to prevent infections associated with catheters intravenous should educate medical staff in the range of indications for the use of intravascular catheters, appropriate procedures for the establishment and maintenance, as well as the use of proper methods of infection control. 2. Periodically check knowledge and application of the guidelines for all persons involved in the establishment and maintenance of intravascular catheters. 3. The setting up and maintenance of intravascular catheters, peripheral and central delegate should only trained competent persons. 4. Ensure appropriate level of nursing care in intensive care units (ICU). The results of observational studies suggest that increasing the proportion of "random nurses"

Certification of Nurses to operate stitches and infusion therapy (CRNI) is possible by nurses after completing long course culminating in an examination. Expertise is particularly known and appreciated in the US and Canada. There also are the main training centers and examination [15].

To take the exam you must:

- 1600 hours have experience in conducting infusion therapy
- active and unrestricted license to practice.

In preparation for the exam, candidates must have knowledge of:

1. Blood and blood components
2. Pharmacology and pharmacokinetics
3. Solutions for infusion therapy
4. Infusion therapy in pediatrics
5. Anatomy, physiology in infusion therapy
6. Body fluids and electrolytes
7. Access central non- venous equipment, infusion therapy and complications
8. Chemotherapy
9. geriatric therapy
10. Improving the quality and legal aspects of infusion therapy.

Care central line

Central venous catheter (CVC) - CVC refers to an intravenous catheter, the inner end is situated in a large central vein. The catheter tip floats freely in the bloodstream in a large vein and parallel to the vein wall. The blood flow around the catheter is maximized, and the physical and chemical destruction of the internal walls of the vein is minimized [11]. Central venous catheters (CVC) is an essential element of treatment is in the intensive care unit (ICU) and in other wards - surgical and conservative. The principles of good practice and strategy of nursing patients with CVC catheter should be used by nurses working in both hospital wards and in the open health care - wherever they reside patients with vascular access [12].

Attaching the central line

Attaching the central vascular catheter in most cases surgery is elective and should be done by the operator using the maximum barrier, which comprises: covering the head, the mask, sterile apron, sterile gloves, sterile large capacity of covering the whole body of the patient. An

assistant when setting the injection should use at least a mask, cap and gloves. To disinfect the skin prior to implantation of the catheter are preferred alcoholic solutions with the addition of antiseptic, for example. A 2% solution of chlorhexidine . The solutions should be rubbed for 30 seconds before starting the procedure and allow to dry formulation according to the time recommended by the manufacturer. Preferred place of central catheter insertion, due to the lowest number of infectious complications during care, subclavian access. However, the choice of implantation site of the physician after a thorough analysis of the indications and contraindications, considering the patient's anatomy and their own skills. The most commonly used method of fixing the catheter suturing it to the skin using surgical sutures. Another method is to mount seamless using special stabilization systems of hypoallergenic adhesive, which prevents additional potential risk of infection in the vicinity of the insertion site, and also provides the ability to correctly care of [2,5,9]. The most commonly used method of fixing the catheter suturing it to the skin using surgical sutures. Another method is to mount seamless using special stabilization systems of hypoallergenic adhesive, which prevents additional potential risk of infection in the vicinity of the insertion site, and also provides the ability to correctly care of [2,5,9]. The most commonly used method of fixing the catheter suturing it to the skin using surgical sutures. Another method is to mount seamless using special stabilization systems of hypoallergenic adhesive, which prevents additional potential risk of infection in the vicinity of the insertion site, and also provides the ability to correctly care of [2,5,9].

Replacing the dressing and grooming central line

A very important element is the change of dressing. At the time of the dressing it is recommended to use aseptic non-contact technique. Type of the gloves used depends on the strategy to be adopted during the procedure, the degree of difficulty in preparing the exact place of the cast, the experience of the person performing. The more the necessary manipulation during the preparation of the application site of the dressing, the more desirable is the use of sterile gloves. Using the principles of good practice, before the foundation of the new dressing should be evaluated catheter insertion site, the condition of the skin around the injection site. Then clean and disinfect the skin and catheter elements [3,4].

The use of the dressing in place cannulation is a key element in the prevention of infectious and noninfectious complications due to the need to maintain the catheter. Dressing helps to

protect the injection site, as well as stabilize the catheter, provided that it is clean and dry. In the general use are: sterile and gas semipermeable "transparent" polyurethane dressings [7,2]. The dressing gas should be used if the patient intensively train, the insertion site bleeding or if there filtration. In this case, the dressing should be changed as often as necessary, additionally, when it is loose, wet. In a situation when it is clean and dry it should be changed every 48 hours, while keeping in mind that if it will be possible to apply transparent semi-permeable dressing. Banners dressing should be changed at least every seven days, in the situation where, as a gas, it will be dirty, loose, etc. Should be his immediate replacement [1,4].

Selected recommendations for central line:

- disinfecting your hands immediately before and after each patient
- daily monitoring of the insertion site, viewing, palpation. These steps binds to checking any signs of infection
-have make disinfection regardless of whether the change of the dressing or the establishment, modification, central line
- dry, clean, transparent not detaching dressing should be changed at least every seven days
- dry, clean dressing gas, which does not come off should be changed every 2 days
- before gaining access to the mouth of the catheter, needleless connectors should be disinfected
- outlet catheter must be intense rubbing disinfected - technology "scrub the hub" for at least 15 seconds [2,5,6].

Hygiene of the insertion of a central patient

Patients with established inserting the facility are at greater risk of nosocomial infections because the blood in order to maintain the hygiene of patients it is recommended to use bath preparations containing antibacterial substances [8,9]. Such a procedure reduces the risk of infection especially in intensive care units. Pharmacies are various property as wipes, scouring pads and sponges of the finished anti-microbial solution. Such solutions are chlorhexidine and octenidine [9] .Used means of the above-mentioned substances must be taken to comply with the manufacturer's instructions. Octenifine preparations can cause drying skins, skin irritation and even skin APAL. Octenifine combined with other products containing iodine can cause hives or other skin changes.

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