TRACHEOSTOMY IN THE I.C.U.

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REZUMAT

Traheostomia în Unitatea de Terapie Intensivă

După intubaţia orotraheală prelungită (peste 3 săptămâni) se pune problema traheostomiei şi evident tehnica acesteia: chirurgical (convenţional, deschis) în sala de operaţie sau percutanat (dilatativ) la patul pacientului. În algoritmul decizional se ţine cont de indicaţiile generale ale traheostomiei şi de contraindicaţiile traheostomiei percutanate dilatative.

Avantajele fiecărui tip de procedură şi aplicarea corectă a acestora funcţie de patologia specifică pacientului, înlătură dezvoltarea complicaţiilor.

Cuvinte cheie: traheostomie, traheostomie percutanată dilatativă, indicaţii, avantaje, complicaţii.

ABSTRACT

After a prolonged orotracheal intubation (over 3 weeks) issues the problem of inserting a tracheostomy tube and by which technique: surgically method or by percutaneous dilatational tracheostomy method at the bedside. That depends merely from the general indications of the tracheostomy and from the percutaneous dilatational tracheostomy contraindications.

The advantage and the correct indication of each procedure depending from the particularities of the patient, avoid complications.

Key words: tracheostomy, percutaneous dilatational tracheostomy, indications, advantages, complications.

Definition:

Standard Tracheostomy (conventional open tracheostomy) is a surgical procedure wherein a standard tracheostomy tube is inserted through an incisional tracheostoma.

Percutaneous dilatational tracheostomy (PDT) is a procedure for inserting a tracheal cannula without a large incision, without extensive dissection of peritracheal tissue and without exposure of the trachea. It is based on a modified Seldinger technique.

Cricothyroidotomy is a surgical technique for placement an airway device into the trachea through the cricothyroid space; by simplicity it is preferred for emergency situations.

Minitracheotomy allows the placement of a 7 French cannula through the tracheal rings for patients with difficult clearing airway secretions.

When?

The American College of the Chest Phisicians`Council on Critical Care recommended tracheal intubation for patients requiring assisted ventilation for less than 7 days, but a tracheotomy if on the 7-th day extubation could be not foreseen in the next few days.

Heffner advised a tracheotomy if the anticipated duration of intubation exceeds 2-3 weeks.

How?

PDT has two techniques:

- Ciaglia (Cook set), with a variant: translaryngeal tracheostomy, and
- Griggs (Portex set)

PTD as described by Ciaglia is a technique that allows the placement of a tracheal cannula by making a small cutaneous incision whithout wide dissection of the pretracheal tissues and exposure of the trachea. The method has a smaller risk of complications than the standard tracheostomy.

A variant of the Ciaglia`s method is described bay Fantoni – aplicable to children; it is named translaryngeal tracheostomy (TLT). The direction of dilatation is from inward to outward. The essential device of TLT is the cone-cannula which acts as a dilatator and cannula carrier. The bronchoscope – preferrable a rigid tracheoscope – is used to locate the site chosen for the stoma, and guide a wire in through the skin and out of the mouth. The mouth end of the wire is connected to a cone-cannula device. This is than used to dilatate the stoma and allow first a scope and than the cannula to be placed. An additional factor acting against the inflammation of the stoma is the single passage of the dilatator: the multiple dilatator method creates a higher exposure to bacterial contamination. The rigid tracheoscope is an important safety factor in TLT because it stiffens the trachea and facilitates the external localisation of the anatomical landmarks.

The Griggs technique: the trachea is punctured with a cannulated needle, a guide wire is introduced and advanced a dilatator forceps along the wire into the tracheal lumen. Instead of several dilatations steps as used in Ciaglia`s technique, the opening in the trachea is enlarged with a forceps. The tracheal cannula loaded over a dilatator is inserted over the guide wire and advanced into the trachea.

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The general indications for tracheostomy:

1. upper airway obstruction - mechanichal-functional
2. prolonged mechanical ventilation
3. tracheobronchial hygiene
4. weaning from ventilation (by reducing the ventilatory dead space)
5. aspiration prevention of the patients with glottic disfunction

The advantages of tracheostomy:

1. reduced respiratory effort
2. better oropharingial hygiene
3. better removal of tracheobronchial secretions
4. rapid weaning from mechanical ventilation
5. easy communication with the patient

Contraindications to PDT:

1. the emergency situation
2. pediatric age (< 16 years)
3. clinical situations with unclear anatomical marks: serious obesity, goitre
4. coagulation disorders
5. impossible translaryngeal intubation
6. cutaneous infections
7. cardiopulmonary instability
8. reduced intracranial compliance
9. unstable fracture of the cervical spine

Complications:

Are divided in general and specific complications, depending on the technique – open tracheostomy or PDT.

General complications:

Perioperative:

1. bleeding
2. pneumothorax
3. tracheostomy tube displacement
4. improper peritacheal insertion
5. arrhitmia

Immediate postoperative:

1. bleeding
2. subcutaneous or mediastinal emphysema
3. wound infections

Late complications:

1. tracheocutaneus fistula
2. tracheoesophageal fistula
3. tracheoinnominate fistula
4. granulations
5. residual opening stoma
6. swallowing troubles
7. tracheal stenosis

Specific complications:

Differences are only in the perioperative complications.

In standard tracheostomy:

1. cardiorespiratory arrest due to vasovagal reactions, tension pneumothorax and pulmonary oedema
2. laringeal recurrent nerve distruction.

In PDT:

1. conversion, from PTD to conventional open tracheostomy because of the major bleeding or inability to insert the cannula.
2. malplacement of the cannula (1%) and accidental „false route". Endoscopy permit direct vision and may avoid this complication.
3. damage of the posterior tracheal wall.

Standard tracheostomy has complications 2-3 times more frecquently than PDT and a higher incidence of tracheal stenosys.

Risk of surgical complications increase five-fold when tracheostomy is applied in emergency situations

Causes of death from PDT:

1. bronchospasm
2. arrhytmia
3. extubation
4. tracheoinnominate fistula

Which one is the best?

An emergency cricothyroidotomy provides the greatest likelihood of a successful airway placement with the lowest risk for complications in patients with upper airway obstruction who cannot undergo translaryngeal intubation.

The Griggs puncture tracheostomy method is more difficult to carry out on obese patients or those with a proeminent pretracheal soft tissue layer, but the Griggs method is more economical.

Comparison of historical experiences of open tracheostomy with PDT are favorable to the latter, but comparative studies have shown no or only minimal differences between the two techniques.

In PTD there is a lower incidence of: stomal infection, shorter duration of the operation and it is easy performed at the bedside.

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