Coniotomy

Coniotomy and coniopuncture (also called cricothyrotomy) are procedures performed to urgently secure an airway in a situation where other measurements have failed or are not available. They are not intended for a long-term securing of the airway. They are rarely performed, however, potentially **life-saving procedures**.

Localization of the procedure

The core of the procedure is to cut through (coniotomy) or puncture through (coniopuncture) the lig. cricothyroideum (lig. conicum) and following insertion of a tube to enable securing an airway. Coniotomy and coniopuncture are **easy** (the ligament is usually easily accessible) and **quick** to be performed**,** and require **minimal** technical requirements for the procedure and equipment.

The **indication** for impossibility to secure airways in another way is usually **aspiration** or stuck **foreign object** in the area of the vocal cord ligaments or in the subglottic area, extensive **trauma** in the orofacial area or different conditions causing difficult conditions for tracheal intubation or other alternatives (combitube, oropharyngeal airway, laryngeal mask) with impossible ventilation using a mask. It may also be a "**cannot intubate, cannot ventilate**" condition at the onset of general anaesthesia. In an emergency situation **the procedure has no contraindication**, the priority is to restore the airway as quickly as possible.

Tracheostomy is not a suitable method for emergency airway management.

The **disadvantages** of coniotomy and coniopuncture are mainly:

- frequent occurrence of complications, such as subglottic stenosis (it is necessary to replace the approach as soon as possible after overcoming the acute situation and to suture the lig. conicum without plunging the sutures into the lumina of the airways);
- cannot be used as a long-term airway - quick transfer (within 24 h) most commonly to tracheostomy

Methods

The literature describes a greater number of procedures for accessing the airway through the lig. conicum. The specific use depends on the practice of the department and the performing physician. A **simple and quick procedure** is essential, because when coniotomy is needed, it is usually necessary to act quickly and confidently. Many departments modify the following procedures in various ways (dilation with fingers, by a forceps or a dilator, use of different sets, cannulas, USG guidance). A smaller number of steps to secure the airway is usually appropriate for dealing with a stressful situation and rapid reaction; a larger number of steps may allow for better insertion or less risk of complications.

The textbook of intensive medicine by Professor Ševčík lists 3 basic methods: surgical coniotomy, BACT and coniopuncture. For all three methods, a **good fixation of the larynx** is essential, as it is laterally mobile due to its position against the vertebrae, and there is a risk of dislocation when the patient coughs after a ligament intersection. **Findting the lig. cricothyroideum** is usually easy; it lies just under the skin and connects the thyroid and the annular cartilage - the first soft spot under the palpable upper edge of the thyroid cartilage.

BACT

Bougie-assisted cricothyrotomy (BACT) is a method which consists of consists of only 3 steps (easy to learn and quick) and allows for a good quality airway (usually with a cannula of a larger caliber than in coniopuncture). No special equipment is needed to perform BACT (both bungs and small intubation cannulas are standard equipment in anesthesia sets).

1. T-shaped incision into the lig. conicum with fixation of the larynx with the non-dominant hand.
2. Introduction of elastic bougie.
3. Insertion of tracheal tube with cuff.

Surgical coniotomy

Standard performance of coniotomy is carried out with visualization of lig. conicum. First, a vertical skin incision is made, then a horizontal incision is made through the visualized ligament. Next, the opening should be widened with a forceps and a special tracheostomy cannula is introduced.

Coniopuncture

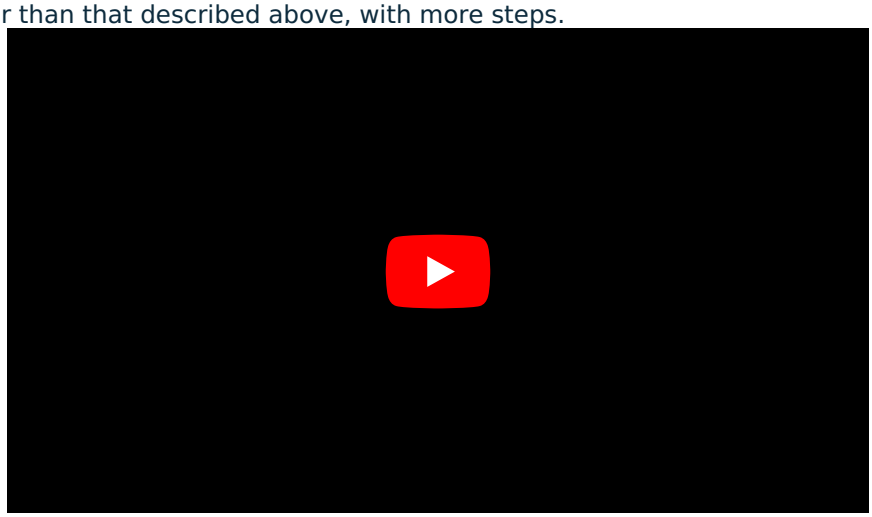
Special coniopuncture sets allow puncture access by various methods, often with dilators inserted through the wire. The methods are usually quick and easy, and can be preferably used for children because of the lower risk of stenosis. They require special sets and usually have more steps to insert than BACT. An alternative is puncture with

two to four wide-diameter intravenous cannulas.

Videos

BACT

This video shows a footage of a cadaveric teaching session, in which a young anesthesiologist successfully performs a BACT very quickly without having performed this procedure before. The vertical incision here is conducted quite long, a second palpation occurs to ascertain the position of the ligament. The procedure is thus probably slightly longer than that described above, with more steps.



Surgical coniotomy

Links

Related Articles

- Securing the airway
  - Endotracheal intubation (pediatrics)
  - Difficult intubation
  - Tracheostomy

External Links

- Koniotomie (pdf) autor Michal Otahal (http://www.akutne.cz/res/publikace/koniopunkce-michal-otahal.pdf)
- Koniotomie (pdf) autor Pavel Michálek (http://www.akutne.cz/res/publikace/koniotomie-pavel-michalek.pdf)
- SAKLES, John C. *Emergency cricothyrotomy (cricothyroidotomy)* [online]. UpToDate, [cit. 2020-05-22]. <https://www.uptodate.com/contents/emergency-cricothyrotomy-cricothyroidotomy>.

Used Literature

- ŠEVČÍK, Pavel. *Intenzivní medicína.* 3. edition. Galén, 2014. 1195 pp. pp. 78. ISBN 978-80-7492-066-0.