

Tracheotomy

Tracheotomy and **tracheostomy** are surgical procedures on the neck to open a direct airway through an incision in the trachea (the windpipe). They are performed by emergency physicians, and surgeons. Both surgical and percutaneous techniques are now widely used.

While tracheostomy may have possibly been portrayed on ancient Egyptian tablets,^[1] the first correct description of the tracheotomy operation for patients who are suffocating was described by Ibn Zuhr in the 12th century,^[2] and the currently used surgical tracheostomy technique was described in 1909 by Dr. Chevalier Jackson of Pittsburgh, Pennsylvania.

Terminology

Tracheotomy, from the Greek root *tom-* meaning "to cut," refers to the procedure of cutting into the trachea and is an emergency procedure.^[3]

A *tracheostomy*, from the root *stom-* meaning "mouth," refers to the making of a semi-permanent or permanent opening, and to the opening itself.

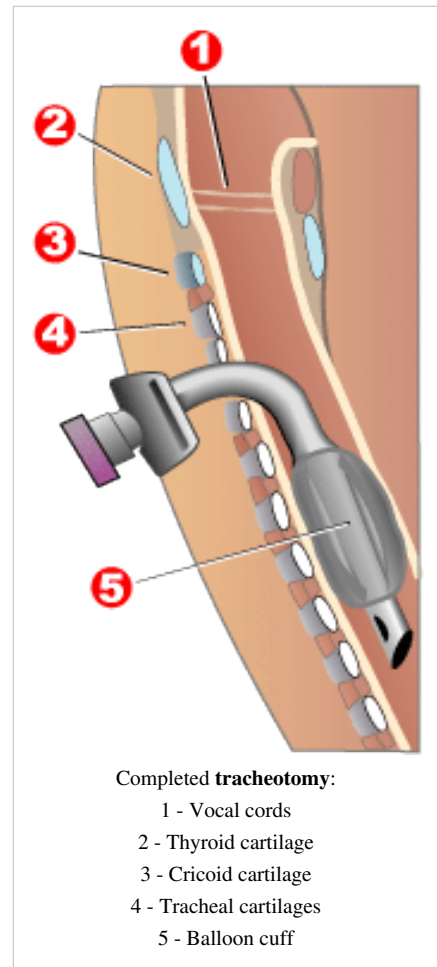
Some sources offer different definitions of the above terms. Part of the ambiguity is due to the uncertainty of the intended permanence of the stoma at the time it is created.^[4]

Uses of tracheotomy

The conditions in which a tracheotomy may be used are:

- Acute setting - maxillofacial injuries, large tumors of the head and neck, congenital tumors, e.g. branchial cyst, acute inflammation of head and neck, and
- Chronic / elective setting - when there is need for long term mechanical ventilation and tracheal toilet, e.g. comatose patients, surgery to the head and neck.

In emergency settings, in the context of failed endotracheal intubation or where intubation is contraindicated, cricothyrotomy or mini-tracheostomy may be performed in preference to a tracheostomy.



Tracheostomy tube

Tracheotomy procedure

1. Curvilinear skin incision along relaxed skin tension lines (RSTL) between sternal notch and cricoid cartilage.
2. Midline vertical incision dividing strap muscles.
3. Division of thyroid isthmus between ligatures.
4. Elevation of cricoid with cricoid hook.
5. Placement of tracheal incision. An inferior based flap, or Björk flap, (through second and third tracheal rings) is commonly used. The flap is then sutured to the inferior skin margin. Alternatives include a vertical tracheal incision (pediatric) or excision of an ellipse of anterior tracheal wall.
6. Insert tracheostomy tube (with concomitant withdrawal of endotracheal tube), inflate cuff, secure with tape around neck or stay sutures.
7. Connect ventilator tubing.

It is also possible to make a simple vertical incision between tracheal rings (typically 2nd and 3rd) for the incision. Rear end flaps may produce more intratracheal granulation tissue at the site of the incisions, making it less favorable to some surgeons.

Percutaneous tracheotomy procedure

1. Curvilinear skin incision along relaxed skin tension lines between sternal notch and cricoid cartilage.
2. Midline blunt dissection down to the trachea (optional depending on technique).
3. Insertion of 14-gauge plastic cannula and needle with fluid filled syringe attached into trachea. Aspiration of air confirms correct placement of the tip in the trachea.
4. Removal of needle leaving cannula in place.
5. Insertion of soft tipped guide wire into trachea through cannula.
6. Removal of cannula leaving guide wire in place.
7. Tracheal dilatation is now undertaken - different techniques do this in different ways.
 1. Ciaglia - the sequential insertion and removal of a series (usually 4-5) of increasing larger dilators over the wire into the trachea.
 2. Griggs - insertion of a specially designed pair of guide-wire forceps along the wire into the trachea and then are opened to complete the dilation in one step.
 3. Rhino - insertion of a single large tapered dilator over a plastic guidewire reinforcement.
 4. Frova Percutwist - insertion of a specially designed screw of increasing diameter which rotates to create the dilatation.
8. Insert tracheostomy tube (with concomitant withdrawal of endotracheal tube), inflate cuff, secure with tape around neck or stay sutures.
9. Connect ventilator tubing.

Risks

During the procedure, there is a risk of damaging the recurrent laryngeal nerves. These nerves control the vocal cords. If one of the nerves is damaged a patient will probably have a problem with his/her voice; if both of the nerves are damaged, the patient will lose his/her speech. This risk of nerve damage is the reason emergency tracheotomies are performed higher up, in the larynx and why tracheotomies have to be done in hospital under anesthetic. Professor Stephen Hawking lost his speech due to a tracheotomy after contracting pneumonia.

Moreover, if the recurrent laryngeal nerve is damaged, the patient will have trouble controlling the flow of air through the rima glottidis, thus ultimately leading to inhibited breathing or suffocation.

See also

- Cricothyroidotomy
- Intubation
- Mechanical ventilation
- History of Tracheotomy

External links

- Tracheotomy Info ^[5] (A Community For Tracheotomy-wearers and the people who love them) at tracheotomy.info
- Aaron's tracheostomy page ^[6] (Caring for a tracheostomy) at tracheostomy.com
- How to perform an emergency tracheotomy ^[7] (For information purposes only.) at tracheostomy.com (This page actually depicts cricothyroidotomy, not tracheostomy)
- RT Corner (Educational Site for RT's and Nurses) ^[8] at rtcorner.net
- (Pictures with video clipping) ^[9] at drtbalu.com
- *Tracheotomy* ^[10] at Dorland's Medical Dictionary
- Smiths Medical Tracheostomy Training Videos ^[11]

References

- [1] "Tracheostomy: Evolution of an Airway," (<http://www.tracheostomy.com/resources/pdf/evolution.pdf>) Steven E. Sittig and James E. Pringnitz, *AARC Times*, February 2001.
- [2] Prof. Dr. Mostafa Shehata, "The Ear, Nose and Throat in Islamic Medicine", *Journal of the International Society for the History of Islamic Medicine*, 2003 (1): 2-5 [4].
- [3] "Adult Tracheostomy," (http://www.bcm.edu/oto/grand/03_06_03.htm) Romaine F. Johnson, M.D. March 6, 2003, Baylor College of Medicine.
- [4] "eMedicine - Tracheostomy : Article by Jonathan P Lindman, MD" (<http://www.emedicine.com/ent/topic356.htm#section~introduction>). Retrieved 2007-12-30.
- [5] <http://www.tracheotomy.info>
- [6] <http://www.tracheostomy.com>
- [7] <http://www.tracheostomy.com/resources/surgery/emergency.htm>
- [8] <http://www.rtcorner.net>
- [9] <http://www.drtbalu.com/tracheostomy.html>
- [10] http://www.mercksource.com/pp/us/cns/cns_hl_dorlands_split.jsp?pg=/ppdocs/us/common/dorlands/dorland/eight/000109880.htm
- [11] <http://www.smiths-medical.com/education-resources/videos/airway/index.html>

Article Sources and Contributors

Tracheotomy *Source:* <http://en.wikipedia.org/w/index.php?oldid=352178619> *Contributors:* -Marcus-, A5b, Abgstat, Activeforever1, Agamemnon2, Ainlina, Akoaraisin, Aranel, Arcadian, Asierra, BadDoggie, Barticus88, Bensin, Bogdangiusca, Brim, Burnsauce, Caw, DJ Clayworth, Davidhorman, Dellidot, DerMika, Dibberri, Doctor aust 23, Docu, Don't give an Ameriflag, Drtbalu, Drum guy, Drutbhuyan, E23, Eequor, Elkman, Fenwayguy, Flemindra, Foscoe, G3pro, Gveret Tered, Indyfitz, Informarun, Ishkabob13, Jagged 85, Jay Jech, Jeremykemp, Jessica DeVoto, Jfdwolff, Joel.Gilmore, Joke137, Jwri7474, Kamaki, Kimchi.sg, Kirasha, Kosebamsse, Leeclarke, Linnell, Lkinkade, LorenzoB, Lpod100, Lupin, MLRoach, Maddy56, Michael Harpur Edwards, Michaelk Vance, Minority Report, Mjklm, Mucram, Muriel Gottrop, Nol888, Nosleep, Novangelis, Nunh-huh, Pakaran, Paxillian, Pgan002, Prolog, QuizQuick, Qwerty Binary, RedWolf, Reneeholle, Rhobite, Rls, Rockfang, Ronhjones, Ronz, SWAdair, Sabbe, Scottalter, Shenme, Skully Collins, Slicedoranges, Slike2, Smartin684, Smilesunshinefun, Sundar, Tearlach, The Thing That Should Not Be, TheEgyptian, Theoneandonlyother, Thomas H. Larsen, Tpeck 86, Valerius Tygart, WJBscribe, Warut, Way of Five Pecks of Rice, Weblook1, Wereon, Will381796, Wjousts, Wouterstomp, Yossiea, Ytracker, ينام, 147 anonymous edits

Image Sources, Licenses and Contributors

Image:Traqueostomia.png *Source:* <http://en.wikipedia.org/w/index.php?title=File:Traqueostomia.png> *License:* unknown *Contributors:* Jeremykemp

Image:Tracheostomy_tube.jpg *Source:* http://en.wikipedia.org/w/index.php?title=File:Tracheostomy_tube.jpg *License:* Creative Commons Attribution 2.0 *Contributors:* User:Enigma51

License

Creative Commons Attribution-Share Alike 3.0 Unported
<http://creativecommons.org/licenses/by-sa/3.0/>