

TRACHEOSTOMY

Tracheostomy is an operative procedure that creates a surgical airway in the cervical trachea. It is most often performed in patients who have had difficulty weaning off a ventilator, followed by those who have suffered trauma or a catastrophic neurologic insult. Infectious and neoplastic processes are less common in diseases that require a surgical airway.

Tracheostomy is a utilitarian surgical procedure of access; therefore, it should be discussed in light of the problem it addresses: access to the tracheobronchial tree. The trachea is a passage between the upper airway and the lungs that delivers moist warm air and expels carbon dioxide and sputum. Failure or blockage at any point along that pathway can be most readily corrected with the provision of access for mechanical ventilators and suction equipment. In the case of upper airway obstruction, tracheostomy provides a path of low resistance for air exchange.

The traditional semantic difference between tracheostomy and tracheotomy is now blurred because the hole is variably permanent. If a cannula is in place, an unsutured opening heals into a patent stoma within a week. If decannulation is performed (ie, the tracheostomy cannula is removed), the hole usually closes in a similar amount of time. The cut edges of the tracheal opening can be sutured to the skin with a few absorbable sutures to facilitate cannulation and, if necessary, recannulation can be performed. Alternatively, a permanent stoma can be created with circumferential sutures. The term tracheostomy is used, by convention, for all these procedures and is considered to be synonymous with tracheotomy.

The trachea is nearly but not quite cylindrical, flattened posteriorly. In cross-section, it is D-shaped, with incomplete cartilaginous rings anteriorly and laterally, and a straight membranous wall posteriorly. The trachea measures about 11 cm in length and is chondromembranous. This structure starts from the inferior part of the larynx (cricoid cartilage) in the neck, opposite the 6th cervical vertebra, to the intervertebral disc between T4-5 vertebrae in the thorax, where it divides at the carina into the right and left bronchi.

Indications

The advent of the antibiotic era and advances in anesthesia have made tracheostomy a commonly performed elective procedure. Indications include the following:

- Congenital anomaly (eg, laryngeal hypoplasia, vascular web)
- Foreign body that cannot be dislodged with Heimlich and basic cardiac life support maneuvers
- Supraglottic or glottic pathologic condition (eg, infection, neoplasm, bilateral vocal cord paralysis)
- Neck trauma that results in severe injury to the thyroid or cricoid cartilages, hyoid bone, or great vessels
- Subcutaneous emphysema
- Facial fractures that may lead to upper airway obstruction (eg, comminuted fractures of the mid face and mandible)
- Edema from trauma, burns, infection, or anaphylaxis
- Prophylaxis (as in preparation for extensive head and neck procedures and the convalescent period)
- Severe sleep apnea not amendable to continuous positive airway pressure devices or other less invasive surgery

Tracheostomy may also be performed to provide a long-term route for mechanical ventilation in cases of respiratory failure or to provide pulmonary toilet in the following cases:

- Inadequate cough due to chronic pain or weakness
- Aspiration and the inability to handle secretions

The cuffed tube allows the trachea to be sealed off from the esophagus and its refluxing contents. Thus, this intervention can prevent aspiration and provide for the removal of any aspirated substances. However, some would argue that the risk of aspiration is not actually lessened, as secretions can leak around the cuffed tube and reach the lower airway.

The Council on Critical Care of the American College of Chest Physicians recommends tracheostomy in patients who are expected to require mechanical ventilation for longer than 7 days. However, the final decision is made on an individual basis based on comorbidities and the patient's current condition.