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Tracheostomy in Pan Facial Fractures.

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ABSTRACT

Tracheotomy is a surgical procedure which consists of making an incision on the anterior aspect of the neck and opening a direct airway through an incision in the trachea (windpipe). The resulting stoma (hole), or tracheostomy, can serve independently as an airway or as a site for a tracheostomy tube to be inserted; this tube allows a person to breathe without the use of his or her nose or mouth. Both surgical and percutaneous techniques are widely used in current surgical practice. It is a procedure which can be performed safely when the patients are under the life threatening conditions such as facial trauma and neck surgeries and head and neck space infections etc.

Keywords: Trachea, Pan facial trauma, Tracheotomy, Atelectasis, Hypoxia, Golding bird.

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INTRODUCTION

The word tracheotomy comes from two Greek words: the root "tom" meaning "to cut", and the word trachea. The word tracheostomy, including 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. Indications for tracheotomy include such conditions as severe facial trauma, neck cancers, large congenital tumors of the head and neck (branchial cleft cyst) and acute angioedema and inflammation of the head and neck. In the context of failed orotracheal or nasotracheal intubation, either tracheotomy or cricothyrotomy may be performed. In the chronic setting, indications for tracheotomy include the need for long-term mechanical ventilation and tracheal toilet (e.g. comatose patients, or extensive surgery involving the head and neck). For comatose patients or such needing long-term sedation, a significant reduction of duration of Intensive-care-unit-stay and administration of sedatives and vasopressors has been shown. In extreme cases, the procedure may be indicated as a treatment for severe Obstructive Sleep Apnea seen in patients intolerant of Continuous Positive Airway Pressure (CPAP) therapy. The reason tracheostomy works well as sleep surgery for obstructive sleep apnea is because it is the only surgical procedure that completely bypasses the upper airway. This procedure was commonly performed in the 1960-1980s for obstructive sleep apnea, until other procedures such as the uvulopalato pharyngoplasty, genioglossus advancement, and maxillomandibular advancement surgeries were described as alternative surgical modalities for OSA.

Definitive management of impending upper air way obstruction in maxilla facial injuries is by tracheostomy as with most other surgical procedures, some cases are more difficult than others. Surgery on children is more difficult because of their smaller size. Difficulties such as a short neck and bigger thyroid glands make the trachea hard to open⁽¹⁾.

Percutaneous tracheotomy

While there were some earlier false starts, the first widely accepted percutaneous tracheotomy technique was described by Pat Ciaglia, a New York surgeon, in 1985. This technique involves a series of sequential dilatations using a set of seven dilators of progressively larger size⁽²⁾. The next widely used technique was developed in 1989 by Bill Griggs, an Australian intensive care specialist. This technique involves the use of a specially modified pair of forceps with a central hole enabling them to pass over a guidewire enabling the performance of the main dilation in a single step⁽³⁾. Since then a number of other techniques have been described. In 1995, Fantoni developed a translaryngeal approach of percutaneous tracheostomy which involves passing a guidewire through the larynx and over it railroading a tracheostomy tube with a cone shaped structure. It is also known as the In-and-out procedure. A variant of the original Ciaglia technique, using a single tapered dilator known as a "blue rhino", is the most commonly used of these newer techniques and has largely taken over from the early multiple dilator technique. Ambesh SP (2005) introduced a T-Trach kit (T-Dagger) which contains a T-shaped dilator with an elliptical shaft. The shaft of the dilator is marked in its length according to the sizes of tracheostomy tube to be introduced and has a number of holes. This T-shaped dilator provides better grip during its introduction and its elliptical shaft forms a calibrated tracheal stoma between two tracheal rings and minimizes tracheal ring fracture⁽⁴⁾. The Griggs and Ciaglia Blue Rhino techniques are the two main techniques in current use. A number of comparison studies have been undertaken between these two techniques with no clear differences emerging⁽⁵⁾.

Procedure:

This procedure can be carried out under local anesthesia, but it is more convenient in general anesthesia. The neck is extended as much as possible and the head stabilised in the midline to prevent any rotation, and a sand bag is placed below the shoulder. The important landmarks such as the thyroid cartilage in the midline the cricoid cartilage and the supra sternal notch should be taken into a consideration. It is more usual in an elective tracheostomy to perform a transverse incision midway between the thyroid cartilage and the suprasternal notch. The skin and the tissues are reflected and the midline facia joining the anterior strap muscles of the neck is identified. Dissection is carried out strictly in the midline through the fascia joining the paired sternohyoid and the sternothyroid muscle. The isthmus of the thyroid gland is identified and retracted superiorly upwards to expose the underlying 2nd and 3rd tracheal ring. After identification a circle of tissues is

excised to include these two rings sufficiently to take the tracheostomy tube. Hemorrhage should be controlled for the clean exposure of the surgical site. Adjacent tissues are sutured to the normal skin circumferentially. Tracheal dilators can then be inserted into the trachea and a cuffed tracheostomy tube is inserted. Once intubation is completed trachea should be free of all secretions and blood by means of suitable suction catheter to prevent them passing down into the bronchi. In children or mentally disturbed parents it is advisable to make an inverted U- shaped incision through the second and third tracheal rings without completing the rings.

The cuff of the tracheostomy tube is inflated until the anaesthetist is able to discern that there is no air leakage. Many authors have explained about the over inflation of the tube, which exerts above normal arterial pressure and the various complications that include mucosal ulcerations, cartilaginous necrosis and eventually tracheal stenosis. Influenced by the lateral wall pressure closing the wounds it is important to note that this should be loosely sutured together since tight closure of the tracheostomy incision may lead to mediastinal emphysema.

DISCUSSION

Airway obstruction is the most serious complication of facial injury. In cases that cannot be resolved by endotracheal intubation, surgical securing of the airway is mandatory^(6,8). The wide variation may be explained by the heterogeneity of the fracture types in the groups examined by the different authors. The high incidence of tracheostomy in, Morgan's series (11)(12.3%) and in Steidler's series^(9,10). According to the literature, the highest percentage of tracheostomy was performed for midface fractures and combined midface and mandibular fractures. In our study, most of the tracheostomies (92%) also were performed on patients with midface fractures. One of the indications for surgical securing of the airway is in cases of midface fractures associated with mandibular fractures. In these cases there is, on the one hand, difficulty in nasal intubation because of distortion of the normal anatomy of the midface and, on the other hand, there is a problem with oral intubation because it may compromise the restoration of proper maxillomandibular relations. We prefer to treat these cases in two steps. In the first stage we use nasotracheal intubation while treating the mandibular fractures in order to have the maxillomandibular relation as the main reference point. These fractures are fixed with rigid internal fixation and the mouth is then opened. In the second stage, the tube is changed to an orotracheal. Massive bleeding due to maxillofacial trauma is also considered one of the reasons for an acute airway obstruction, and therefore for tracheostomy. Posterior nasal packing with gauze or a Foley catheter, and immediate temporary reduction of the fractures, and maxillary disimpaction or intradental wiring, reduces the bleeding and minimizes the risk of subsequent airway obstruction.⁽¹³⁾ It has long been advocated that patients with facial trauma are at high risk for cervical spine injury and thus require surgical securing of the airway because of the need to avoid manipulation of the cervical spine that occurs during intubation. The current literature indicates that the correlation between facial fractures and cervical spine injury is low, and ranges only between 0.3% to 4.4%.⁽¹¹⁻¹⁵⁾

CONCLUSION

Once the purpose of tracheostomy is over the tube should be removed as early as possible. More the time it is kept indwelling more are the chances of the chest infection. If the metal tube lumen plugged with a gauze piece, the patient should be observed for breathing. Tracheostomy is performed in emergency situations when patients are at morbid situations and it has its own advantages and disadvantages as well. Complications that includes damage to internal jugular vein, surgical emphysema, air embolism, cricoid cartilage damage, recurrent laryngeal nerve damage, tracheoesophageal fistula. even though it has many disadvantages and contraindications it is the most important procedure performed widely under local and general anaesthesia in emergency situations.

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