

HEADLINES

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TRACHEOSTOMAL STENOSIS

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What is tracheostomal stenosis?

Tracheostomal stenosis (stomal stenosis) is a narrowing of the stoma following total laryngectomy, which is a general definition for a complex problem. Stomal stenosis causes anxiety and distress in the laryngectomee and creates a clinical challenge to the medical team. A recent article by Lucioni, et. al. (2003) states that stomal stenosis is not easy to define: for example, tracheostomal diameter (or the measured size of the opening), only applies as a criterion if body mass or size of the patient is considered, since patients of small build are known to have small tracheostomas without any problem. Functional criteria are, instead, more reliable and are based on the laryngectomee's ability to breathe comfortably under stress or at rest without shortness of breath. At the MJ Dance Head and Neck Rehabilitation Center the Head and Neck Surgeons, Speech Pathologists, and Clinical Head and Neck Nurse Specialist agree, as a *general* guideline, that a stoma size of 10mm or less is considered problematic. When evaluating the problem, the team considers the patient's:

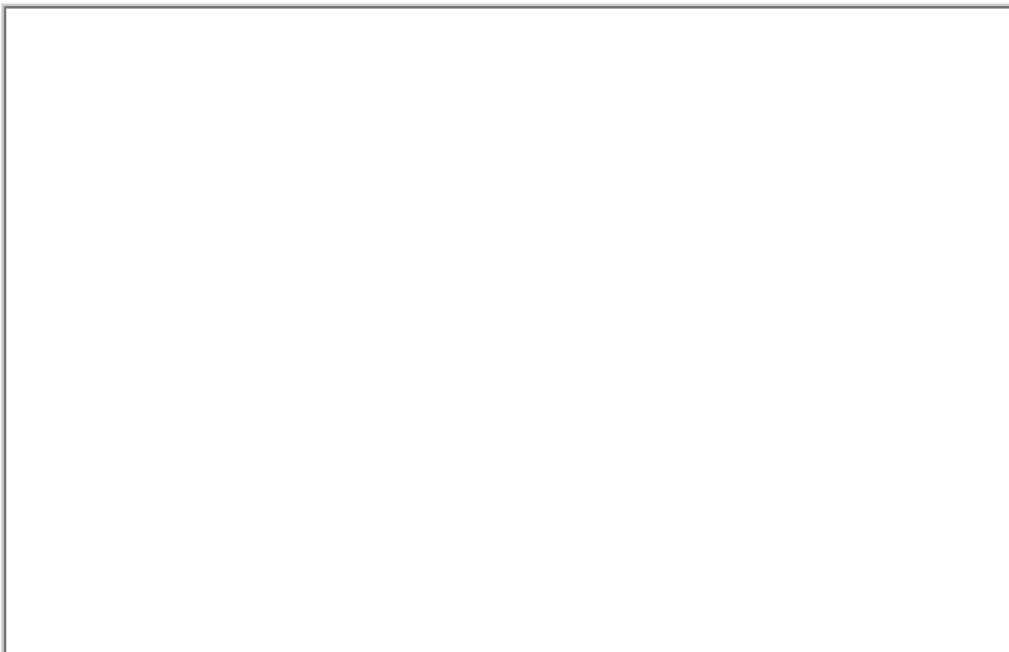
- body size
- ability to clean the stoma
- ability to clear mucous from the airway
- ability to breathe comfortably at all times
- access to the tracheoesophageal 'voice' prosthesis, if present, for cleaning and changing
- stoma and tracheal appearance (crusting, poor healing, mucous plugs, etc. are problematic)



Why does the stoma narrow?

Many factors are involved in producing stomal stenosis. The primary causes are the formation of scar tissue and other tissue changes around the stoma resulting in a narrowing or contraction. Several factors may contribute to this possibly life-threatening problem, such as:

- initial surgical technique used to create the stoma
- infection around the stoma
- swelling after surgery
- tissue changes as a side-effect of radiation
- the patients anatomy (i.e., body size, tracheal size)
- prominent muscles around the stoma (e.g., sternocleidomastoid muscles) may create a vertical slit narrowing of the stoma
- other medical problems, such as, diabetes (poor wound healing), thyroid problems and chronic obstructive pulmonary disease (COPD)
- recurrent tumor





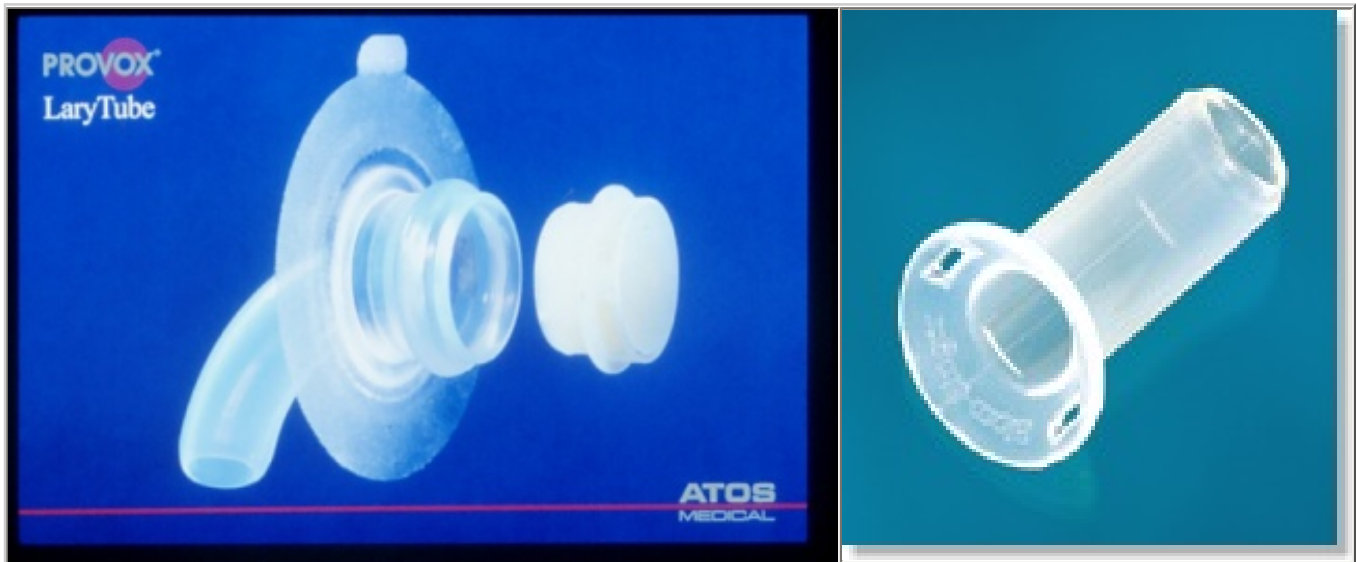
The patient's ability to manage the stoma and meet hydration and nutritional needs may contribute to how well this problem can or cannot be managed.

When and how frequently does this problem happen?

Stomal stenosis can happen immediately post laryngectomy or any time thereafter. The reported incidence varies, ranging from 4% to 42% and typically is found more frequently in women than men (Kuo, et.al., 1994). Other more recent studies report 4% to 13% of laryngectomees experience this problem (Cruise, et.al., 2004). Suffice it to say that it is a common problem facing many laryngectomees. As would be expected, this complication creates a great deal of concern and anxiety for laryngectomee and the rehabilitation team. It may be a short-term problem that can be managed by using various dilation or stretching methods to widen the stoma. If the stenosis continues, surgical stoma revision may be required to prevent persistent narrowing.

How is the problem corrected?

The management of stomal stenosis depends upon severity. The main goals are to allow patients to breathe and function comfortably. A review of the medical and surgical literature from 1982 through 1999 shows various ways to surgically correct the problem. In the more recent papers, various types of laryngectomy products, such as silicone laryngectomy tubes, stoma buttons or tracheostoma vents are advocated. These products are often very helpful in keeping the stoma from narrowing.



How does the surgeon and rehabilitation team lessen the patient's risk of stomal stenosis? Other factors to consider ... *the benefits of a Heat-Moisture Exchange System (HME).*

Today, at our institution, the approach to this problem is guided by the goal of establishing the most normal breathing (with HME) and natural voicing possible. That is, hands free with tracheoesophageal voice prosthesis (TEP) and tracheal stoma valve (TSV), as needed.

It is always best to take a preventative approach. Surgically, our preference is for a circular-shaped stoma to improve chances of fitting an HME System and TSV for physiologic, hands free voicing. For optimal results, the sternal heads of the sternocleidomastoid muscles should be cut at the level of the sternum to allow for a broader flat surface around the stoma.

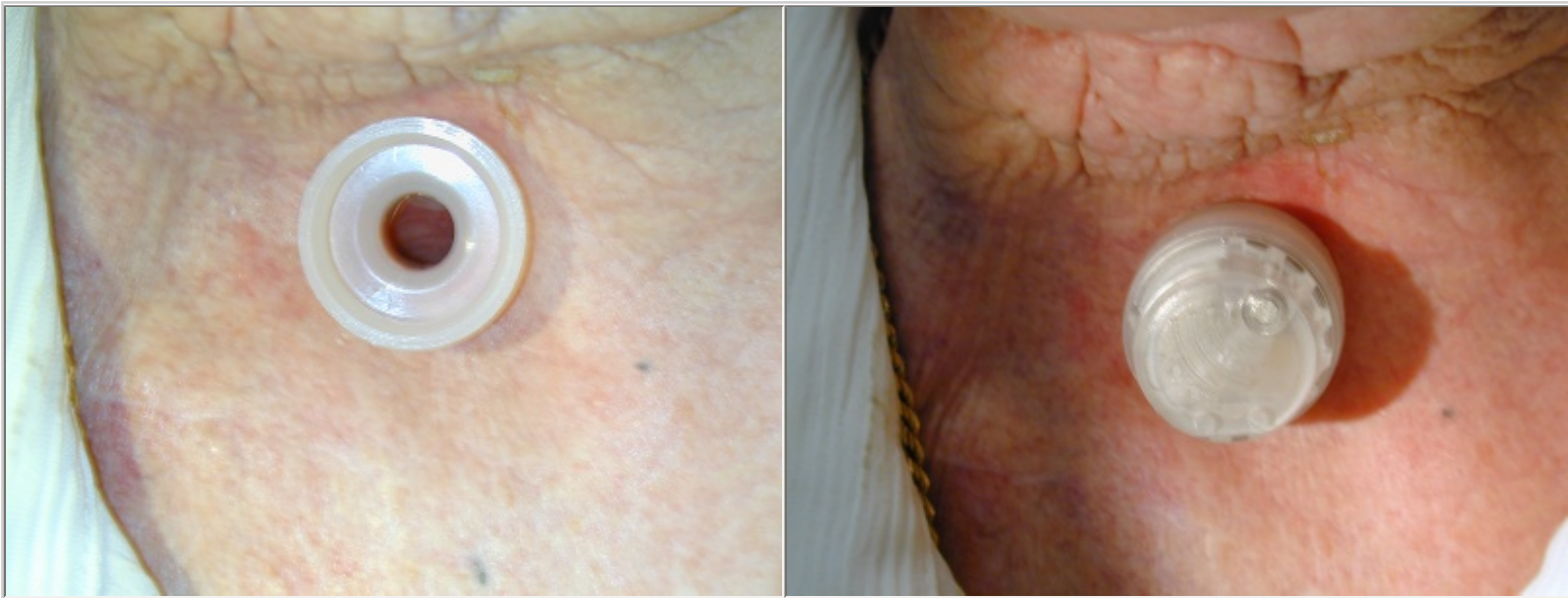
The primary benefits of the HME system are to:

- filter unwanted particles from entering the stoma
- partially restore moisture and warmth to the airway.
- partially restore breathing resistance and improve lung function (positive pressure in the alveoli keeps the lungs expanded and avoids alveolar collapse).
- decrease the amount of crusting around the stoma
- provide a more hygienic stomal appearance
- decrease secretions

Steps towards the laryngectomee's acceptance and use of an HME system may begin as early as day #1-2 after the laryngectomy. The patient is instructed on the use of an HME/TSV system (Hilgers, et.al.). The HME system is attached using a tape disc housing and a silicone laryngectomy tube, as tolerated. This allows laryngectomees to become accustomed to using an HME system - to use a laryngectomy tube and/or tape housing and filter over his/her stoma.



As the rehabilitation process progresses, the team works towards using the HME/TSV system with the silicone tubes that fit directly into the stoma (intraluminal attachment), such as a Barton Mayo Button, Provox LaryTube or Trachinaze Stoma Stud, rather than an adhesive housing or tape disc that attaches around the stoma (peristomal attachment). This is because the intrastomal attachment is easier to use and care for than the peristomal attachment. With the use of these silicone tubes, the stoma is held open and the chance of tracheal stoma stenosis is virtually eliminated.



What happens when the silicone tubes do not solve the problem?

When stomal stenosis persists, and the use of silicone laryngectomy tubes fail to keep the stoma from narrowing, attempts are made to dilate the stoma with metal laryngectomy tubes. Depending on the size of the stoma, the #4 metal tube is used first. The stoma is progressively dilated on the initial visit. Often, the dilation can progress to #6 or to #8. If #8 is achieved, a stoma vent is inserted and the patient is seen in follow-up for refinements. In most instances, dilation to adequate size can be achieved in one session. The patient is then fitted with either a stoma vent or other silicone laryngectomy tube to maintain adequate opening and prevent narrowing.



If adequate dilation cannot be achieved, surgical correction reconstruction may be necessary. Under those circumstances, we have generally utilized local tissue transfer, such as Z-plasty to correct the stenosis. We would then use the intrastomal HME/TSV device in order for the patient to resume physiologic breathing and hands free voicing.

Conclusion

Tracheostomal stenosis is a complex problem faced by many laryngectomees. Clearly there are numerous factors which may cause tracheostomal stenosis. Management of this challenging problem begins with a proper surgical procedure and early introduction of laryngectomy products designed to

maintain adequate opening and good physiologic functioning. For those with a tracheoesophageal voice prosthesis, another aim is to provide hands free voicing. The ultimate goal is always to improve quality of life post laryngectomy.

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webwhispers.org is a site with helpful information on what to do before and after a laryngectomy. It includes educational sections on larynx cancer as well as a complete Library of Information, lists of Suppliers, a monthly newsletter, and Humor. Laryngectomees, caregivers, and professionals can meet on two different e-mail lists to exchange messages, ideas and support. In addition, there is a forum with message boards for social interaction. This is the largest internet support group for laryngectomees and is a member club of the IAL.

The Official site of the International Association of Laryngectomees

<http://www.larynxlink.com> has all of the current information on the IAL, plus many newsletters from all over the US (including HeadLines for the last two years). Information is always available for the IAL Annual Meeting and Voice Institute held once a year.