

Adjustable Implant for Treatment of Glottic Insufficiency

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Technology description

Glottic insufficiency is the medical term used to describe inadequate vocal fold contact during voice production. Glottic insufficiency results in poor voice quality and “breathiness” during phonation, and also may cause problems with breathing and swallowing. In the case of certain disorders that cause glottic insufficiency, treatment is primarily surgical and aims to medialize (i.e., move toward the center) one of the vocal folds by placing it closer to the normally functioning fold.

One surgical technique, injection laryngoplasty, is a simple method that can be performed as an outpatient procedure. However, it cannot correct severe cases of vocal fold paralysis and may decrease post-treatment voice quality and/or result in absorption of the injected material into the surrounding tissue. An alternative approach is medialization thyroplasty, or medialization laryngoplasty. In this method, an implant is used to fix the paralyzed vocal fold in a midline position, allowing for contact with the contralateral normal fold. Implants currently used in this procedure are limited by the potential for extrusion into the airway, inability to be modified for individual patients and the lack of options for adjusting the degree of medialization post-operatively. Improved surgical implants for the treatment of glottic insufficiency are needed. UW-Madison researchers have developed an inflatable, adjustable laryngeal implant for the treatment of glottic insufficiency. The implant utilizes an implantable balloon stabilized by a titanium frame. The titanium frame is implanted into the thyroid cartilage of the larynx to provide a mount for the implant and to prevent it from shifting into the airway. The adjustable implant is filled with saline, which pushes the paralyzed vocal fold closer to the functioning fold to restore vocal fold capabilities and alleviate breathing, swallowing and voicing issues. The balloon is filled through a port and valve configuration that also can be used to remove any excess saline, allowing for post-operative adjustment.

Additional Information

Hoffman M.R., Witt R.E., McCulloch T.M. and Jiang J.J. 2011. Preliminary Investigation of Adjustable Balloon Implant for Type I Thyroplasty. *Laryngoscope* 121, 793-800.

Application area

Treatment of glottic insufficiency, including vocal fold paralysis

Advantages

- Allows for post-operative adjustment of volume and compressibility
- Enables customization for an individual patient's anatomy
- Preserves the mucosal wave
- Fastens securely to the thyroid cartilage to prevent blockage of the airway

Institution

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