Otolaryngology online journal

ISSN 2250- 0359 Volume 2 Issue 1 2012

Gore tex medialization thyroplasty- A case series

Dr Karthikeyan Arjunan Dr Balasubramanian Thiagarajan

Abstract:

Unilateral vocal fold paralysis classically presents with voice change, aspiration of ingested materials and cough. Medialization thyroplasty has become treatment of choice for un recovering vocal fold palsy. Still the ideal implant has not been defined in the surgical medialization of vocal folds. We present our experience of gore tex as the implant material.

Introduction:
Vocal fold paralysis is a rather common problem causing speech problems to the patient. If the other cord does not compensate adequately these patients may have troublesome aspiration also. Aspiration happens to be the most dreaded complication of vocal fold paralysis. Management of these patients is possible only by performing medialization thyroplasty. Various implants have been used in this procedure. Presently lot of interest has been generated in Gore tex medialization thyroplasty.

Materials and methods:
A study was conducted in Govt. stanley medical college, Chennai from the year 2009 to 2011. In the period we did 4 cases of medialization thyroplasty with Gore tex material. Cases were evaluated objectively and subjectively.

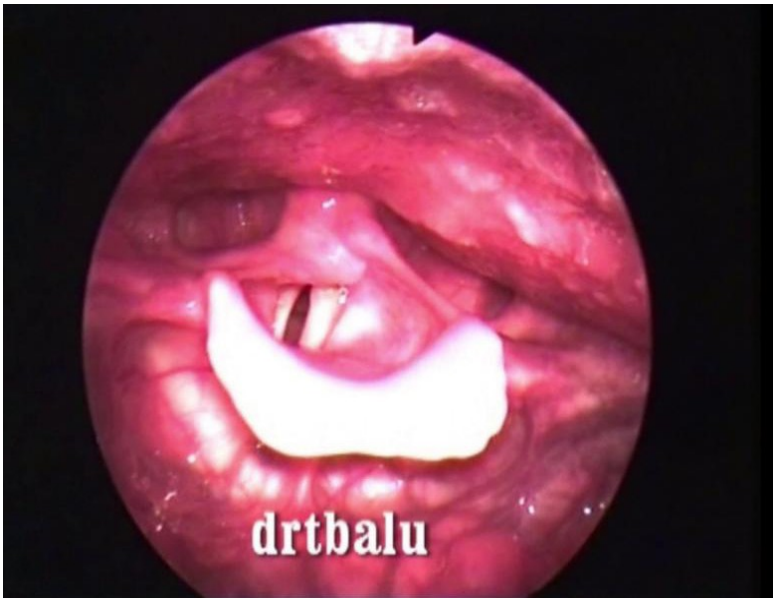
Inclusion criteria:

1.Unilateral vocal fold paralysis due to paralysis, paresis, atrophy.
2.Unilateral vocal fold scarring, soft tissue loss
3.In selected cases of parkinson's diseases with vocal fold atrophy.
Exclusion criteria:

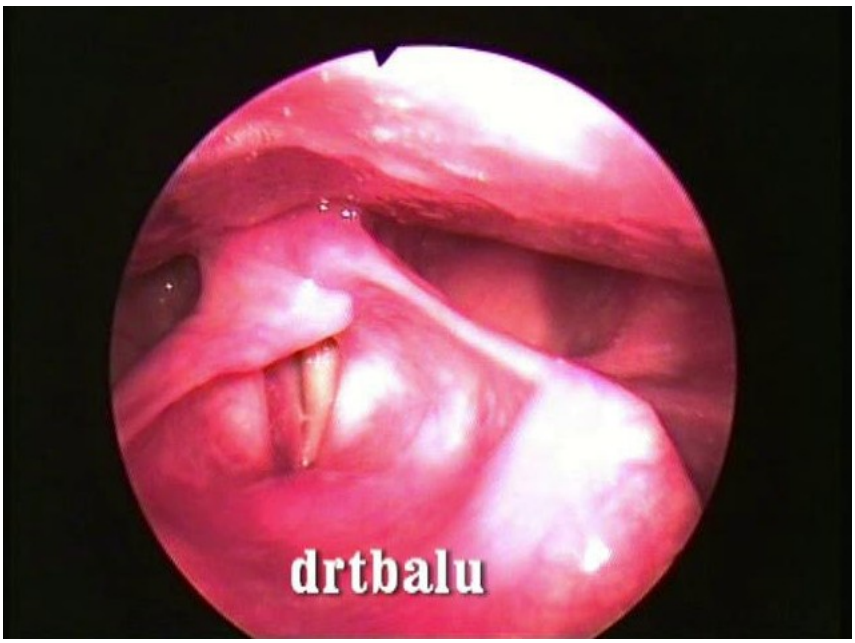
1.Previous history of irradiation or surgery.
2.Malignant lesions involving larynx
3.Poor abduction of contralateral vocal fold.

Patient evaluation:

Objective measures:
1.videolaryngoscopic examination:
Videolaryngoscopic examination was done and recorded for all patients to compare pre operative with post operative vocal cord status. Glottic gap,overriding of arytenoid are noted.



Pre operative videolaryngoscopic picture showing glottis gap and overriding of arytenoids



Post operative VLS examination- disappearance of Glottic gap is seen

2. Maximal phonation time:
The average maximal phonation time of these patients is 6 seconds against normal value of 25 seconds. It is improved post operatively to 20 seconds.
3. Manual compression test:
Even though it is not specific manual compression test done and quality of voice is assessed.

Picture showing Manual compression test

Subjective measures:

Patient's self evaluation:
1.Voice:

Scoring was given to evaluate the voice of the patient as below.

Voice	Original voice	Improved	same	Worse
Scoring	2	1	0	-1

Patients were interviewed and scoring were recorded on 6th post op day.

Voice	Case 1	Case 2	Case 3	Case 4
Scoring	1	2	2	2

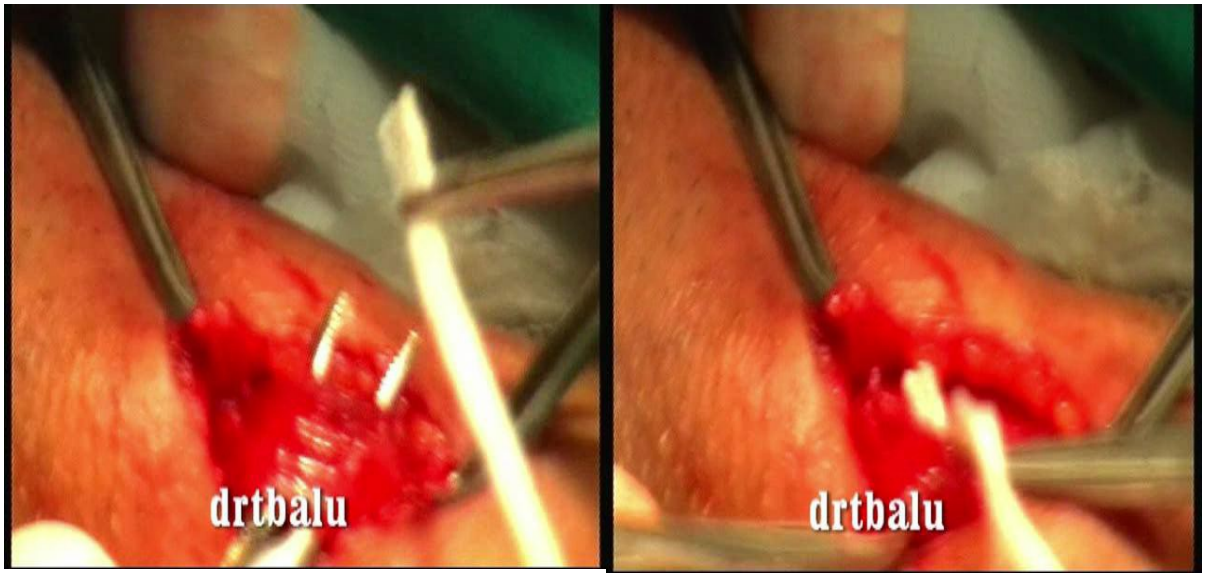
And patients were followed up on 3 months and 6 months and the same quality of voice is assured.

2.Aspiration and cough:

Aspiration and cough were relieved completely in all patients.
Surgical technique:
All cases were done under local infiltration anaesthesia[2] using 2%xylocaine mixed with1 in 1,00,000 units adrenaline.

Picture showing skin incision

Horizontal skin crease incision[3,4]beginning at the mid portion of the thyroid cartilage extending to the paralyzed side.



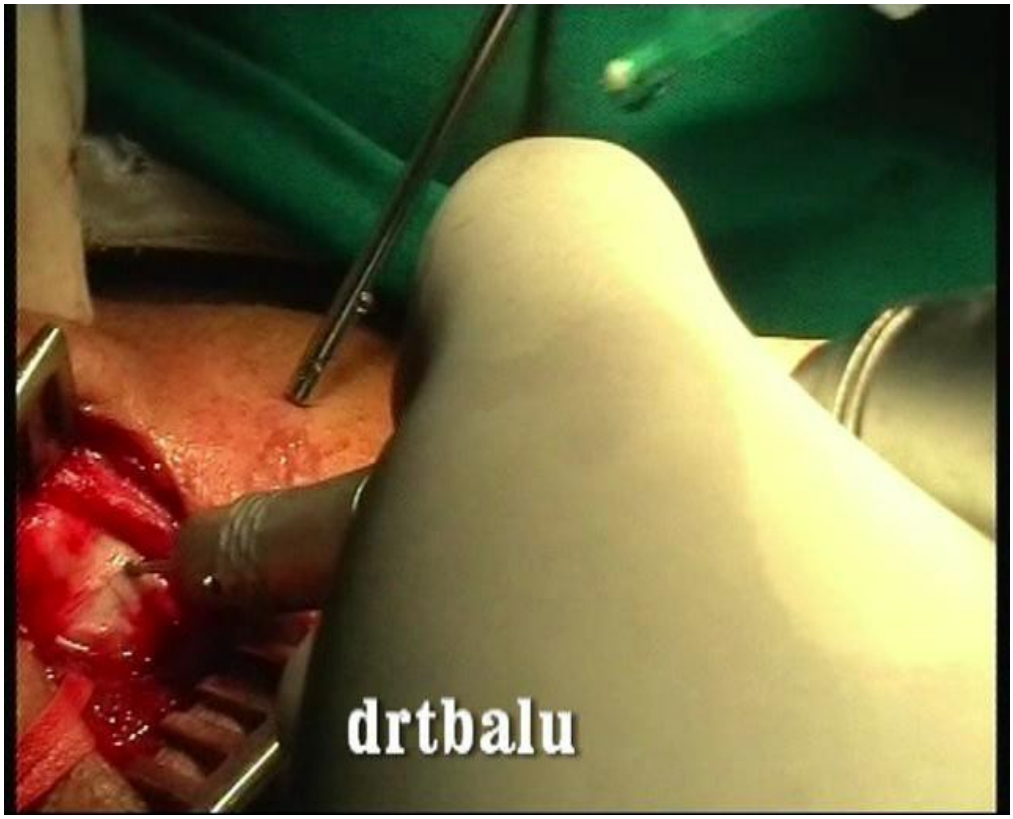
Pictures showing strap muscle separation

The strap muscles are separated away from midline and held apart from the operating field using umbilical tape.

A tracheal hook is used at the level of laryngeal prominence and pulled medially. This helps in mobilizing the cartilage better. The thyroid cartilage perichondrium is incised in the midline and extended laterally towards the paralyzed side.

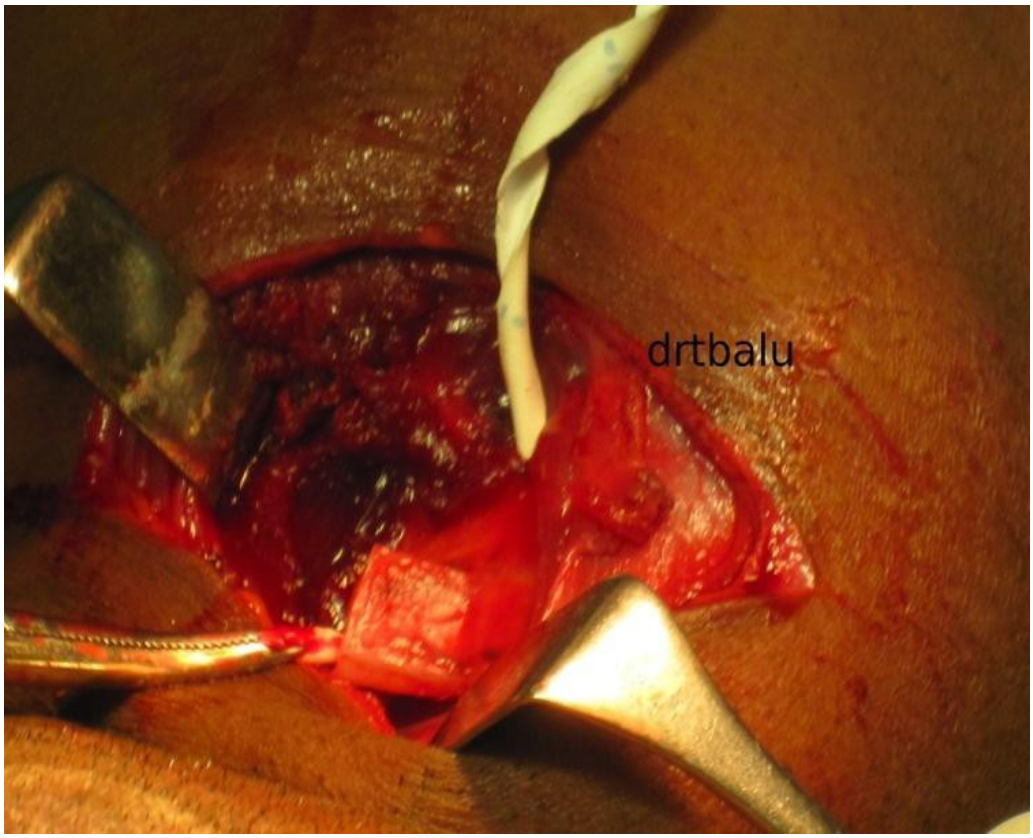
Picture showing skeletenised thyroid cartilage

The thyroid lamina on the paralyzed side is skeletonized up to the level of cricothyroid membrane. Strips of cricothyoid muscle that come in the way are excised. Dimensions of cartilage cuts[3,4]: Appropriate size of cartilage window is about 5mm x 10mm. The lower border of the window should be about 3mm above cricothyroid membrane. This ensures that the lower strut of thyroid lamina doesn't fracture when window is being created. Anterior border of the window is 8mm posterior to the midline.



Creation of window in the thyroid cartilage.

If thyroid cartilage is calcified then fissure burr can be used to create the window. The inner perichondrium is elevated from the under surface of thyroid lamina using scissors[3,4]. The inner perichondrium incised posteriorly and inferiorly. It is not incised anteriorly. Now the cricothyroid membrane is incised in order to separate it from the lower border of thyroid cartilage. A septal elevator is introduced through the inferior margin of thyroid lamina and the paraglottic space is compressed medially while the voice of the patient is assessed. If the result is acceptable then 1 cm wide Gor-Tex strips dipped in bacitracin solution is introduced via the inferior margin of thyroid lamina and delivered via the window.



Picture showing Gore tex insertion

The amount of Gor-Tex insertion is dependent on the improvement of quality of voice
Conclusion : Gore-tex implant showed significant improvement in glottal gap closure and loudness. The result persists for 3 to 6 months follow up period.

Discussion: Gore-Tex is a waterproof/breathable fabric, and a registered trademark of W. L. Gore and Associates. a porous form of polytetrafluoroethylene1 (the chemical constituent of Teflon) with a micro-structure characterized by nodes interconnected by fibrils. Gore-Tex materials are typically based on thermo-mechanically Expanded polytetrafluoroethylene (PTFE) and other fluoropolymer products. They are used in a wide variety of applications such as high performance fabrics, medical implants, filter media,insulation for wires and cables, gaskets, and sealants. However, Gore-Tex fabric is best known for its use in protective, yet breathable, rainwear. The outer layer is typically

nylon or polyester and provides strength. The inner one is polyurethane, and provides water resistance, at the cost of breathability. [1] The first surgical treatment of unilateral vocal cord paralysis in the modern era was Bruning's intracordal injection of paraffin in 1911.[2]

In 1915 Payr [2] introduced anteriorly based thyroid cartilage flap.Each procedure produced only limited success. In 1960s the first synthetic material, teflon was used for vocal fold injection for medialization. Several authors then introduced different modifications but the procedure did not become popular until the late 1970's when Isshiki[2] introduced his thyroplasty technique. This involved displacing and stabilizing a rectangular, cartilaginous window at the level of the vocal cord, therefore pushing the soft tissue medially. This technique gained wider acceptance after Isshiki reported the successful use of Silastic as the implant material. This procedure has been modified by many surgeons by using different prosthesis. In 1996 hoffman and Mc Cullouch reported the first case of medialization thyroplasty using Gore tex material[3.]
There are some notable advantages[2,5,6] to the Gore tex material. The flexibility of the ribbon allows the surgeon to distribute the degree of medialization differently along the length of the vocal fold. Thus alllowing finely tuned intraoperative adjustments that do not involve removal and replacement of the entire prosthesis. This flexibility also allows the surgeon to fit the ribbon through a small cartilage fenestration. The Gore tex implant does not require carving ,is relatively easy to place,and its malleability permits contouring of the surrounding tissue. Greater pliability also may decrease extrusion potential and make Gore tex a more naturel implant for vocal fold augmentation. Because of these unique properties inherent to the material itself , and the case of surgical placement , indications for thyroplasty may be expanded to include almost any anatomic defect at the glottic level that leads to aerodynamic glottic insufficiency.

References:

1.Gore tex wikipedia, free encyclopedia
2.Gore tex medialization thyroplasty: objective and subjective evaluation. Jesse selber, Robert sataloff,Joseph spiegel,and Yolanda Heman Ackah vol 17, Issue 1, page 88-95, 2003
3.Hoffman HT, Mc Cullouch TM, V ictoria L.Laryngeal paralysis In Gates G, ed. Current therapy in otolaryngology.6th ed st louis, MO:Mosby; 1998: 446-452.
4.Hoffman HT, Mc Culloch TM. Anatomic considerations in the surgical treatment of unilateral laryngeal paralysis. Head Neck 1996;18: 174-187 5. McCulloch TM, Hoffman HT. Medialization laryngoplasty with expanded polytetrafluoroethylene. Ann Otol Rhinol Laryngol 1998; 107:427–432.
6. Implants in Medialization Thyroplasty : Silastic vs Gore-Tex Hazarika and Dipak Nayak Otolaryngology -- Head and Neck Surgery 2010 143: P215 2010,06 423