The Surgical Management of Anterior Glottic Web

History

- 1882, Fleischmann: First observed in an infant at autopsy.
- 1889, Sciffert reported a family case: father, a son, and two daughters had congenital webs.
- 1892, Von Schroetter corrected an anterior web of the larynx using hard rubber tubes.
- 1932, Tucker, advocated endolaryngeal removal of the web + a tracheotomy for dyspnea → direct laryngoscopic exam.
- 1950, McNaught, Laryngofisure + Tantalum keel.
- 1957, Alonzo and Regules, cutting a web by inserting a triangular piece of polyethylene.
- 1960, Lynch, polyethylene tube fixed by external sutures.
- 1961, Wright, small webs may produce few symptoms and may not be found until later in adult life.
- 1965, Cavanaugh, 10/204 congenital webs.
- 1970, Holinger:
  - Thin glottic webs: several rapid dilatations.
  - Thicker webs: incision followed by an insertion of polyethylene tube.
  - Occasionally a thyrotomy with placement of a tantalum keel, left in place for 6 weeks.
  - A tracheotomy was required for all of these surgical procedures.
- 1975, Hardingham, endoscopic procedure with Silastic keel.
- 1979, Dedo, the endoscopic insertion of a Teflon keel.

TYPE:

Congenital vs Acquired

Congenital Glottic Webs

- Congenital webs comprise 5% of congenital laryngeal anomalies.
- 2002, McElhinney, 10% Chromosomal 22q11 deletion and trisomy 21, 36% cardiovascular anomalies.
**Embryology**

- 18th day: medial pharyngeal groove, first stage
- 25th day: tracheobronchial groove
  - Pharyngoglottic duct
  - Epithelial lamina → anterior commissure
  - Vestibulotracheal duct (infraglottis)
  - Dissolution and autolysis of the epithelial lamina (from the dorsal to the ventral part of the larynx) → Disruption → basis for congenital web formation
- 2000, Milczuk, mechanism remains unknown

**Carnegie Embryologic stage 19-23**

**Acquired Anterior Glottic Webs**

- Most common causes: blunt laryngeal trauma and surgical manipulation
  - Excision of mucosa of both anterior vocal surfaces after removal of laryngeal polyps or laser ablation of papilloma will result in scar formation between the leading edges of the vocal ligaments
  - Moderate injury → hematoma at anterior commissure → fibrosis and blunting
  - Severe injury → thick anterior scarring, from the false cords down to the trachea
SURGICAL INTERVENTION

External Techniques

- Gold standard: laryngofissure
  - McNaught, 1950, Tantalum keel
  - Severe anterior glottic webbing requires external laryngofissure
  - Stenotic segment extends more than 5 mm subglottically
  - Associated with a thyroid cartilage fracture
  - Endoscopic approaches have failed

- Dedo and Sony 1984, Isshiki et al: mucosal flap

Endoscopic Techniques

- Haslinger, metal keel
- 1979 Dedo, endoscopic placement of a keel, suitable for thinner glottic webs

  - Keel is left in place for 3 to 4 weeks

- 1984 McGuirt, endolaryngeal mucosal flap on the superior surface of the web
  - Using the smallest size of the variable beam CO2 laser
  - From commissure to free edge of the web, maintaining as far laterally as possible
  - The mucosa is undermined using laser vaporization
  - Triangular mucosal flap is then draped over the ipsilateral denuded cord
  - Using a large spot, low-energy setting, the flap is "spot welded" to the vocal cord surface
  - Achieves unilateral cord coverage to prevent reformation of scar

- 1987 Parker, special designed silastic keel, tubular anterior edge and flat posterior wing
- 1999 Hsiao: McNaught type silver keel

- 2000 Hsueh:

- 2002 Schweinfurth

CONCLUSION
- Anterior glottic webs are an uncommon problem
- More frequently from iatrogenic or traumatic cause
- The gold standard: laryngofissure with keel or stent
- More and more endoscopic approach
REFERENCES