Medialization Laryngoplasty with Silastic Implant in Unilateral Vocal Cord Paralysis

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The state of art of Laryngoplastic surgery gaining day to day importance where Rhinoplasty stood almost a century ago. Medialization Laryngoplasty using Silastic Implant for the correction of symptomatic unilateral vocal cord paralysis is discussed.

Key Words

Vocal cord paralysis, laryngoplasty, silastic implant, phonosurgery.

INTRODUCTION

"Medialization Laryngoplasty" describes laryngoplastic procedure that restores the voice in unilateral vocal cord paralysis. It stood for a long time as an unexplored surgical method and now remains the most important surgical technique for correction of unilateral vocal cord paralysis.

HISTORICAL ASPECTS

The history of correction of paralytic dysphonia started as early as 1915 by Brunnings with the technique of intracordal paraffin injection. Payr 4 years later described laryngeal frame-work surgery with cartilage flap technique and neither has gained much importance. Almost 50 years later Arnold popularised intracordal injection of Teflon but recently the limitations of Teflon injection have become apparent.

Regarding development of Medialization Laryngoplasty, in 1952 Meurman implanted autologous rib cartilage between the ala and inner thyroperichondrium. Out of the 15 patients 6 had excellent voices. 2 cases developed extrusion of the cartilage. One developed

dyspnoea, and others had substantially improved voices. In 1955 Opheim placed thyroid cartilage within the substance of vocalis muscle which had resulted in oedema and airway obstruction. In 1975 Isshiki et al achieved medialization by displacing a stabilised, rectangular cartilaginous window at the level of vocal cord on the paralysed side.

In 1980 Isshiki reported successful use of silastic for medialization. In 1986 Koufman described a formula for calculating approximate size of rectangular window.

MATERIAL AND METHODS

Mr. V. R. aged about 23 years attended on 1-3-96 a private clinic at Guntur, A.P. India with complaint of hoarse voice of 10 years duration. At various E.N.T. centres he was advised to undergo speech therapy. In the recent times his hoarse voice stood as objection for his selection as a Police Constable. Indirect laryngoscopy by a mirror was showing right vocal cord paralysis, the paralysed cord in the paramedian position. After thorough ENT checkup he was subjected to other investigations like CBP, VDRL, Upper panendoscopy, xray of neck and chest, CT scan of base of skull and mediastinum, all were found within normal limits. On Transnasal Fiberoptic Endoscopy glottic chink was found elliptical with about 2 mm gap. The finding was recorded. His voice was also recorded on a Audio cassette recorder.

OPERATIVE TECHNIQUES

After taking informed written consent, the patient was premedicated with 25 mg of promethazine

(phenargan) and 30 mg of pentazocine about 20 minutes prior to surgery. The patient was kept in supine position with the head in the neutral position.

After marking the incision with skin marker, local Anaesthesia was given with 1% Xylocaine with 1. 100,000 Adrenaline. A transverse incision of 3 cm length was given starting from the midpoint of Thyroid lamina on the paralysed side. The subcutaneous tissue, platysma were incised, the strap muscles were cut and separated exposing the thyroid lamina, widely on all its sides on the paralysed side. Mollison's mastoid retractor was used for the retraction of the tissues. The laryngoplasty window was marked as per the Koufman's formula.

KOUFMAN'S FORMULA

$$\text{Window height (mm)} = \frac{\text{Thyroid alar height (mm)} - 4}{4}$$

$$\text{Window width (mm)} = \frac{\text{Thyroid alar height (mm)} - 4}{2}$$

After incising the perichondrium, the window was made on the thyroid lamina with a fissure burr. The mobile window segment was depressed medially while the patient was phonating letter "Ee" alternatively, anteriorly, posteriorly, and in its midportion to determine and to judge for the correct position of the implant. Small holes were drilled in the centre of proximal and distal margins of the window. Anterior lip was created in the anterior part of the window for stabilising the Implant anteriorly. A prepared silastic Implant measuring 4 mm x 5 mm x 13 mm was introduced into the window. The implant was fixed in position using 4 'o' prolene passing through the holes at the proximal and distal borders of the window. The implant was fixed finally when the patient was phonating with good voice and glottic gap was satisfactorily closed as observed through the Fiberoptic Laryngoscopy with a video monitor. His voice improved on the table. The wound closed with light compression dressing and antibiotics given for 5 days.

The post operative period was uneventful and he was discharged on 7th post operative day. The patient's voice was recorded on 3rd day, 15th day, and 3 months after surgery. Till to date 3 months after surgery, the patient is maintaining good voice. Fiberoptic Laryngoscopy in the postoperative period was showing satisfactory closure of the glottic gap.

DISCUSSION

Patients with voice disorders live desperately because they do not believe that correction is possible. For several years symptomatic vocal cord paralysis was treated by Teflon injection but recently it's limitations have become apparent. The limitations are 1. Need for patient's cooperation under local Anaesthesia. 2. Need for certainty that motor function will not return to the paralysed cord. 3. Presence of deficient soft tissue or extensive scarring of the paralysed cord. 4. In central neurological or proximal vagal lesions the voice results are not satisfactory after the injection. 5. When there is Anatomical variation proper injection is not possible which can give deficient posterior glottic closure. So in it's place Medialization Laryngoplasty is found to be very effective procedure for restoring voice in paralytic dysphonia.

Compared to mirror and telescopic laryngoscopy, Transnasal fiberoptic laryngoscopy (TFL) has been found to be a most reliable way to evaluate glottis preoperatively. Videostroboscopy is useful in assessing whether the paralysed cord has muscle tone or flaccid. Laryngeal Electromyography (EMG) can provide good prognostic information regarding possible return of motor function. In symptomatic unilateral vocal cord paralysis, if the posterior glottis is not opened only Medialization Laryngoplasty is performed whether or not motor function returns or not at a later date. If the posterior glottis is open and EMG shows complete denervation then both Medialization Laryngoplasty and Arytenoid Adduction procedures are recommended.

The common complications described with

Medialization Laryngoplasty are, exstusion of implant, Laryngocutaneous fistula, wound infection and air way obstruction.

Apart from it's application in paralytic Dysphonia it is said that Medialization Laryngoplasty can be used successfully in presbylarynx, in glottic deformities, in bowing of vocal cords. Bilateral

medialization has been described in adults with bowing of both vocal cords. Relative contraindications described for Medialization Laryngoplasty are in patients who had external beam irradiation to the neck, or in previous radical neck surgery, and also in diabetics and in immunosupressed individuals.

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CONGRATULATIONS !

Dr. P. Thulasi Das of Madras has won a Bronze Medal for the best video presentation in the Professional Education Category in 16th World Congress of ENT 1997 held at Sydney, Australia.