

Management Of Paralytic Dysphoniaour Experience

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Abstract: For several years restoration of voice in case of paralytic dysphonia remained as challenging problem. Development of phonosurgical techniques like Medialization Laryngoplasty (M.L.) or Thyroplasty and Arytenoid Adduction (A.A.) technique was a breakthrough in the management of paralytic dysphonia. This study was done in 22 cases of paralytic dysphonia, which consists of medical management esp. voice therapy and laryngoplastic phonosurgery which includes Thyroplasty type I or Medialization Laryngoplasty & Arytenoid Adduction technique. The study includes followup of patients for four years.

Keywords: Arytenoid Adduction, Dysphonia, Medialization Laryngoplasty, Vocal Cord Paralysis.

I. Introduction

Dysphonia means difficulty in phonation, but is the term routinely used to denote abnormal voice production due to mechanical or rheological factors involved in vocal cord movement. There are several types of dysphonia of which paralytic dysphonia is a common cause.

Patients with paralytic Dysphonia usually present with symptoms of - change in Voice, choking attacks, aspiration, stridor depending on the type of paralysis of vocal cords, i.e. Unilateral or Bilateral.

Treatment Modalities for paralytic dysphonia include

1. Voice Therapy and Rehabilitation
2. Vocal Cord injection techniques
3. Laryngoplastic phonosurgery
4. Reinnervation surgery with ansa cervicalis

The most important aspect of rehabilitating voice is defining the patient goals. It is always a team work between otolaryngologist, voice therapist, psychologist and voice teacher.

Assessment of patients by speech pathologist allows for maximal medical treatment to be implemented before consideration is given to surgical treatment. Some patients develop hyper functional compensatory mechanisms which lead to the common complaints of voice strain, neck discomfort and fatigue. Speech pathologist can help to eliminate these habits and educate the patient on proper compensation techniques. Relaxation exercises, aerobic conditioning, voice exercises and other methods are all practiced by the patient to improve voice quality. Once vocal therapy has been maximized and further voice improvement is desired, surgical options may be considered. Utilizing voice therapy in treatment of unilateral vocal cord paralysis is crucial to ensuring the greatest improvement in voice.

In 1915 Payr reported the first medialization procedure through the anteriorly based cartilage flap for correction of paralytic dysphonia. Since then several methods were described for medialization of paralyzed vocal cord. Professor Isshiki of Japan who popularized the Silastic implant in medialization also had the credit of introducing for the first time the technique of Arytenoid Adduction for correction of paralytic dysphonia.

Selection of phonosurgical procedures in cases of paralytic dysphonia depends on the severity of patient's symptoms, glottis configuration, the tone of the paralysed cord, and status of paralysis (temporary or permanent). Since Arytenoid Adduction (AA) is an irreversible procedure it is adapted only in long standing, uncompensated, unilateral vocal cord paralysis with breathy dysphonia and also in cases where it is ascertained that the neuronal function of the affected vocal cord will not return to normal as shown by Laryngeal EMG. AA is also indicated in high vagal lesions with a triangular glottis defect of more than 2 mm and also in cases where the paralysed vocal cord is at much lower level when compared to normal cord, as observed by fiberoptic laryngoscopy. In these cases AA is done as a primary procedure along with medialization laryngoplasty. Secondary AA is done when the previous Thyroplasty type I, has failed to give sufficient voice improvement due to posterior glottis gap.

II. Material & Methods

22 patients with paralytic dysphonia attending E.N.T. Clinics at Visakapatnam from January 2012 to January 2016 were taken for study. All these patients were subjected to the preliminary investigations for paralytic dysphonia including CT, FL Scopy recordings and audio recording of voice and palpation of arytenoids under DL Scopy. Out of 22 cases, 7 cases (31.81%) had good subjective improvement of voice on

conservative treatment with voice therapy and, Laryngoplastic Phonosurgery was done in remaining 15 cases (68.18%) after 6 months of conservative treatment.

In 7 cases (46.67%) both medialization and Arytenoid adduction was performed, in 4 cases (26.67%) only medialization Laryngoplasty was done and in 4 cases (26.67%) secondary arytenoids adduction was done, where medialization was done previously with little or no improvement. The voice improvement was observed during operation itself in about 95.45% of cases. The preoperative and post operative voice qualities of each patient were rated according to the Voice rating scale (Fig 01) by a speech pathologist.

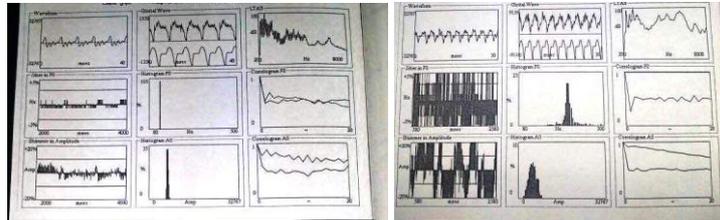


Fig 01: Voice Analysis

All cases were operated under local anesthesia with intra operative voice monitoring. All the cases were subjected to voice training in the post operative period. The cause of vocal cord paralysis, the occupation of the patient, duration of dysphonia and whether primary or secondary AA done are shown in the following table.

Case No.	Sex & Age	Occupation	Cause of Vocal	Duration of cord Paralysis	Procedure Dysphonia
1.	M22	Police	Idiopathic	10 years	ML+ AA
2	F 35	Fruit Seller	Post Thyroidectomy	2 years	ML+AA
3	M 42	Medical Officer	Idiopathic	7 years	ML+AA
4	F 65	House Wife	Idiopathic	3 Years	ML+AA
5	M 26	Bank Officer	Head Injury	1 year	AA in Second Stage
6	M 52	Teacher	Post Intubation	1 year	ML + AA
7	F 30	House Wife	Post Thyroidectomy	2 years	ML + AA
8	M 36	Preacher	Idiopathic	3 years	AA in Second Stage
9.	F 45	Clerk	Chest Injury	1 year	AA in Second Stage
10	M 33	Teacher	Idiopathic	2 yesrs	ML + AA
11	M 45	Labourer	Idiopathic	3 years	ML
12	F 45	House Wife	Post Thyroidectomy	1 year	ML
13	M 55	Labourer	Idiopathic	2 years	ML
14	M24	Student	Post Traumatic	1 year	ML
15	M65	Retired	TB of Lung	2 years	ML

III. Surgical Technique

After taking informed consent the patient is subjected to premedication with 50 mg of promethazine (Phenargan) and 25 mg of Pentazocine (Fortwin) half an hour before the surgical procedure. Patient is kept in supine position with a little extension of neck and head turned to the normal side. A transverse incision of about 4 inches length is marked with a marker pen from the midline at the midpoint of the thyroid lamina to the middle of the sternomastoid on the paralysed side. 1% Xylocaine with 1 in 1,00,000 adrenaline is infiltrated in and around the incision area. After making the skin incision the superficial fascia and platysma are incised, the superficial jugular veins are ligated and the strap muscles are clamped, cut and coagulated. The thyroid lamina is exposed on all its sides and thyroplasty type I(M.L) is completed in following steps – Designing the Window, Cutting the cartilage window, and adjustment of medial displacement of the window and Fixing of the Window.



Fig Window Creation by cutting thyroid cartilage Fixiation of the Silastic implant to the thyroid cartilage

In Artenoid Adduction (AA) Technique the primary step is identification and division of cricothyroid joint after separating it from its pharyngeal musculature. The inferior horn of the thyroid cartilage is lifted up with a hook and the cricothyroid muscle is divided. 1 cm. Cephalically, the cricoarytenoid joint is identified and confirmed by palpating with the finger. Using a sharp blunt tipped scissor cricoarytenoid joint is divided, exposing its glistening articular surface over the cricoid cartilage. The muscular process of the arytenoids is freed of its muscular attachments and 3 zero prolene is passed through the freed muscular process of the arytenoids. The prolene is pulled along the direction of action of lateral cricoarytenoid muscle for observing the improvement of voice. At the same time the position of the arytenoids is confirmed with the help of transnasal fiber optic video laryngoscope. At this stage one must be careful not to injure the bulging pyriform sinus mucosa. The muscular process of the arytenoids is fixed to the thyroid lamina by passing prolene through it antero inferiorly after confirming for a good voice. The wound is closed in layers with a drain and dressed. The patient is kept on systemic antibiotics for about one week and steroids for about 4 days post operatively.

IV. Results

Out of 22 cases, 7 cases (31.81%) had good subjective improvement with voice therapy and Laryngoplastic Phonosurgery was done in 15 cases (68.18%).

In 7 cases (46.67%) both Medialization and Arytenoid adduction was performed, in 4 cases (26.67%) only Medialization Laryngoplasty was done and in 4 cases (26.67%) secondary arytenoid adduction was done, where medialization was done previously with little or no improvement. The voice improvement was observed during operation itself in about 95.45% of cases. The preoperative and post operative voice qualities of each patient were rated using Voice Rating scale by a speech pathologist. (1) Normal, (2) near normal (mild Dysphonia) (3) Moderate Dysphonia (4) Severe Dysphonia (5) Aponia. Out of 7 patients who underwent primary AA procedure with medialization laryngoplasty (ML) 4 cases had voice score of 1 and 2 cases voice scores of 2. 4 patients who underwent AA in second stage after preliminary ML with score 3 had improvement of voice and attained score 1. This improvement was due to closure of posterior commissure defect by AA procedure. 4 patients who underwent Medialization Laryngoplasty had voice score of 1.

V. Complications

In all cases operated the post operative period was uneventful except

1. In one case with Medialization Laryngoplasty and Arytenoid Adduction Technique, in a woman aged 60 years there was stridor necessitating Tracheostomy on the 4th Postoperative day due to Retrolaryngeal Hematoma.
2. In another case of arytenoids adduction technique, a man aged 70 years, injury to pyriform fossa occurred during dislocation of calcified crico-arytenoid joint, which was repaired immediately.
3. In two cases voice was deteriorated 1 year after surgery due to dislodgement of implant for which revision surgery was undertaken.

VI. Discussion

Patients suffering from paralytic dysphonia particularly professional voice users move desperately thinking that there is no proper treatment. Invention of intracordal injection of Teflon Paste has created a hope for victims of vocal cord paralysis and it has been practiced for several years by Oto-Laryngologists in various parts of globe, but has several limitations. In fact, the innovation of Laryngoplastic Phonosurgical techniques have revolutionized the treatment of paralytic dysphonia and has given a ray of hope for professional voice users. Laryngoplastic Phonosurgery proved superior to Teflon Injection in producing optimum voice production in paralytic dysphonia. In this study laryngoplastic phonosurgery which includes Thyroplasty Type 1 or Medialization thyroplasty and Arytenoid Adduction technique and the results are compared with Kaufmann's

Study. 93.34% of the Patients underwent Laryngoplastic Phonosurgery had excellent voice recovery both perceptually and objectively, when compared to 98% in Koufman series. The complications are more common with Arytenoid Adduction technique when compared with Thyroplasty Type 1 alone. The study includes follow up of patients for four years and the long term results are awaited. This work is a humble attempt to show the application of Laryngoplastic phonosurgery in the management paralytic dysphonia, which constitutes a considerable group among voice disorders.

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