

A PROSPECTIVE STUDY TO EVALUATE THE OUTCOME OF FLEXIBLE ENDOSCOPIC INJECTION THYROPLASTY IN PATIENTS OF VOCAL FOLD PARALYSIS

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ABSTRACT

INTRODUCTION

Injection Laryngoplasty in the office setting have shown promising results with significant improvement in both subjective and objective voice outcome measures in patients of Vocal fold paralysis

OBJECTIVE

The aim of this study was to evaluate the safety, efficacy and outcome of Flexible Endoscopic Injection Type-1 Thyroplasty in patients of Unilateral Adductor Vocal fold paralysis

METHOD

A Prospective hospital based Interventional study was carried out in the department of ENT of a Tertiary Care Medical College and associated Hospital during a period of 22 months from January 2020 to October 2021. A total of 60 patients were selected according to Inclusion criteria and Exclusion criteria. Each of these patients underwent Injection Laryngoplasty with Gel foam under Local Anesthesia. Auditory perceptual assessment was done using modified GRBAS score, Voice Handicap Index and Maximum phonation time.

RESULTS

Statistical analysis revealed a significant difference between pre and post-injection voice quality as assessed by "GRBAS" scale and Voice Handicap Index (VHI). Maximum phonation time (MPT) was sufficiently increased following injection and

improvement was consistent throughout the follow-up periods.

CONCLUSION

Injection Laryngoplasty with gel foam paste is a temporary remedy for compensatory therapy for vocal cord paralysis without any major disadvantages.

KEYWORDS

Hoarseness, Vocal cord paralysis, Injection Thyroplasty

INTRODUCTION

Vocal fold immobility is a broad term used to describe vocal folds that are restricted secondary to mechanical fixation or neuropathy. Among the various techniques and approaches described for Injection Laryngoplasty in the office setting, all have shown promising results with significant improvement in both subjective and objective voice outcome measures.^[1,2,3&4] The aim of this study was to evaluate the safety, efficacy and outcome of Flexible Endoscopic Injection Type-1 Thyroplasty in patients of Unilateral Adductor Vocal fold paralysis.

MATERIAL AND METHODS

A Prospective hospital based Interventional study was carried out in the department of ENT of a Tertiary-Care Medical College and Associated Hospital during a period of 22 months from January 2020 to October 2021. A total of 60 patients were selected according to Inclusion

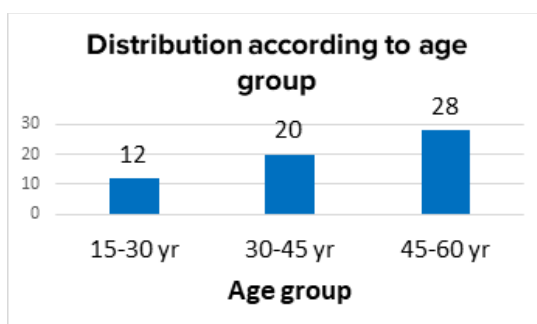
criteria (Age 14-60 years and Unilateral adductor vocal fold paralysis) and Exclusion criteria (Age <14 and >60 years, Bilateral Vocal paralysis, diagnosed case of CA Larynx, medical contraindications for Local Injection and any vocal disease like infection, benign or malignant tumor). After taking proper written informed consent and institutional ethical clearance, each of these patients underwent Injection Laryngoplasty with Gel foam under Local Anesthesia via percutaneous route through the Cricothyroid membrane under vision using flexible fiberoptic laryngoscope until the desired augmentation and voice quality was achieved. Auditory perceptual assessment was done using modified GRBAS score, Voice Handicap Index and Maximum phonation time. Statistical analysis was performed comparing pre-injection, 1week and 1month post injection voice scores.

RESULT

In our study, majority of the patients were from fifth and sixth decade (46.67%). (Tab 1)

Table 1: Age distribution of patients

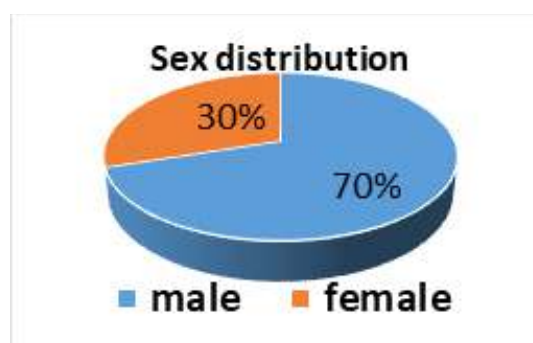
Age Group	No. of Patients	%
15-30	12	20.00
30-45	20	33.33
45-60	28	46.67
Total	60	100.00



Male preponderance was seen with male to female ratio as 2.33:1. [Tab-II]

Table II: Sex distribution of patient

Sex	No. of Patients	%
Male	42	70.00
Female	18	30.00
Total	60	100.00

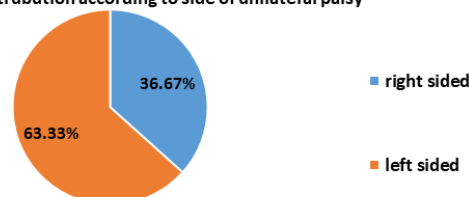


Left sided Unilateral Vocal cord palsy was more common with left vs right laterality as 1.73:1. [Tab-III]

Table III: Distribution according to laterality as

Sex	No. of Patients	%
Right	22	36.67
Left	38	63.33

Distribution according to side of unilateral palsy



Most common etiology of unilateral vocal cord palsy was Idiopathic followed by iatrogenic trauma during thyroid surgery. [Tab-IV]

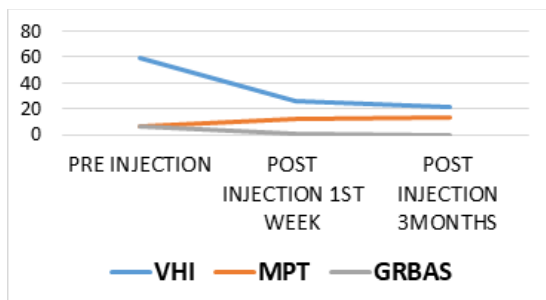
Table IV: Etiology of unilateral vocal fold paralysis (UVFP)

Cause	No. of Patients	%
Idiopathic	42	70.00
Thyroid Surgery	13	21.67
Neck Trauma	05	8.33
Total	60	100.00

Statistical analysis revealed a significant difference between pre and post-injection voice quality as assessed by “GRBAS” scale and Voice Handicap Index (VHI). Maximum phonation time (MPT) was sufficiently increased following injection and improvement was consistent throughout the follow-up periods.[Tab-V]

Table V: Pre-injection and post injection comparison of voice assessment according to GRBAS, VHI and MPT

	Pre Injection	1 week after post injection	1 month after post injection
VHI	59.27±7.47	26.74±4.84	21.77±4.04
MPT	6.27±0.96	11.87±1.83	13.05±1.39
GRBAS	6.28±0.95	0.233±0.42	0.01±0.25



Recurrence is defined as regaining of poor quality of voice after gel foam injection laryngoplasty after 4-6 weeks. 6 out of 60 patients in our study, complaint of hoarseness in between 2-3 months after gel foam injection Laryngoplasty. [Tab-VI]

Table VI: Three months post injection recurrence rate

	No. of Patients	%
Recurrence	06	10
Non-Recurrence	54	90



Post injection pain was the most common post procedure complication seen in 32(53.3%) patients followed by Vocal cord edema in 5(8.3%) cases. None of the patients developed hemoptysis, stridor or LRTI. [Tab-VII]

Table VII: Post procedure complications

Complications	No. of Patients	%
Post Injection pain	32	53.33
Vocal Cord Edema	5	8.33
Laryngeal spasm	0	0
Hemoptysis	0	0
LRTI	0	0

Discussion

This prospective randomized study was conducted in the department of ENT of a Tertiary Care Medical College and Associated Hospital during a period of 22 months from January 2020 to October 2021 on 60 indoor patients of unilateral vocal fold paralysis selected according to the inclusion and exclusion criteria. The age of the patients assorted from 14 - 60 years. Males 42(70%) outnumbered females 18(30%). Our results were similar to **Storck C et al (2007)** whereout of 26 patients, 19 were men. Male is to female ratio was 2.7:1. ^[5][Seyed Javad Seyed Toutouchi](#) et al (2014) studied a case series of 45 patients with vocal cord paralysis. Out of these, 31 patients (68.9%) were male and 14(31.1%) were female. ^[6]In the present study, 22(36.67%) patients had right vocal fold paralysis while in 48(63.33%) patients left vocal involvement was seen. The

ratio between left and right vocal fold paralysis was 2.18:1. Comparable results were obtained in the study by Milstein CF et al (2005) with predominance of left cord involvement and the ratio between left and right vocal fold paralysis as 2.33:1.^[7] Jaya Gupta et al (2013) corroborated similar findings where most of the patients presented in 5th (26.67 %) and 6th (21.67 %) decade. Males outnumbered females in the ratio 2.3:1.0. Left vocal cord was paralyzed in 69.64% and right cord in 30.36%.^[8] In our study the most common cause for cord palsy was found to be Idiopathic in 42 (70%) patients, followed by Iatrogenic (post thyroid surgery) in 13(21.61%) and neck trauma in 05(8.33%) patients. In accordance to our findings, [Nilanjan Bhowmick et al \(2014\)](#) too reported most common etiological factor as idiopathic in 136(49.1%) cases. The incidence of various other etiologies were surgical trauma 60(21.6%), nonsurgical trauma 10(3.7%), nonlaryngeal malignancy 36(12.9%), central/neurological 17(6.1%), post radiation 1(0.3%) and other benign lesions 17(6.1%). Thyroidectomy was the single most common surgical cause for unilateral vocal cord palsy, followed by other non-thyroid neck surgeries (20%) and anterior cervical decompression (18.3%).^[9] In perceptual assessment of the voice assessed by modified GRBAS scale, all parameters showed gradual satisfactory improvement after injection. The results are in agreement with Woo et al. & Powell et al (2014)^[10]

¹The patients in the present study reported significant improvement in their perceived voice in the 1st follow-up (after 1 week) and this improvement continued after 1 month. This finding was similar to the study of Wang et al. (2013) who reported an improvement in all parameters^[11]. According to our study, the follow-up periods (1 week and 1 month) after injection laryngoplasty showed decrease of VHI, this significant decrease in the VHI was close to the results reported by Rudolf and Sibylle(2012)^[12] Injection Laryngoplasty lead to significant increase in MPT when comparing pre-injection with post-injection results.

This improvement in the acoustic parameters implies improvement of the patients' Auditory Perceptual Assessment (APA). These results were in accordance with Fang et al & Boshnaq (2017)^[13]. Because of the relatively long period of cord stability following Gelfoam injection, the patients were able to practice and to improve the quality of their voice with or without speech therapy. R. Arold et al (1986) also stated long-lasting positive result in respect of vocal performance in 24 patients following Gel foam injection.^[14] In the present study, 32(53.33%) patient complaint of pain after injection which improved with analgesics after 24 hours. Only 5 patients developed Vocal cord edema post injection which subsided spontaneously in 48 hours. None of the patient developed hemoptysis, stridor or LRTI. Schramm et al (1978) also reported local mild mucosa edema at the injection sites which resolved over 2 or 3 days.^[15]

CONCLUSION

Injection laryngoplasty with gelfoam paste is a temporary remedy for compensatory therapy for vocal cord paralysis without any major disadvantages.

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How to Cite the article

Singh R et al, A Prospective Study To Evaluate The Outcome of Flexible Endoscopic Injection Thyroplasty in Patients of Vocal Fold Paralysis, *UPJOHNS* June 2022; 10(1) - 22-27 DOI: <http://doi.org/10.36611/upjohns/volume10/Issue1/4>



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