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Research Article

A Observation Study of Benign Lesion of Larynx

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ABSTRACT
Aims and objectives: The present study was conducted to categorize the various benign appearing lesions of the larynx. Material and methods: This is a prospective study involving patient with apparently benign looking lesion not improved after two month of conservative treatment including medical treatment, avoidance of risk factors and voice therapy. 50 cases presenting with apparently looking benign laryngeal lesion were selected and subjected to micro laryngeal surgery in the Department of the Otorhinolaryngology, RNT Medical College, Udaipur (Rajasthan) Result and **conclusion:** Benign laryngeal lesions are prevalent in all age groups but more common between 20 to 30 years of age group. Vocal cord nodule and polyp are the most common encountered benign laryngeal lesions. Males are more affected with these lesions. Synergistic effect of vocal abuse, smoking and chronic respiratory tract infections, gastro oesophageal reflux, alcohol, atmospheric pollution and allergy, mental stress and sino nasal disease are the contributing factors for development of benign laryngeal lesions

INTRODUCTION

Speech is one of the unique qualities that set human apart from all other living organisms. Human voice is important not only for speech but also for communication. Voice is produced by the vibration of two vocal folds which are part of glottis. The lesion of glottis thus affects the movements of the vocal folds resulting in change in voice and is commonly known as hoarseness of voice [1].

Benign laryngeal lesion is not a rare entity. Large number of patients attending otorhinolaryngology outpatient department presenting with hoarseness of voice have benign lesion of larynx. It may be large enough to obstruct airway and threaten life of an individual or may produce hoarseness of voice. Hoarseness of voice due to vocal fold lesion has deep impact on the emotional and occupational aspect of life [2].

Common benign laryngeal lesions are vocal nodules, Polyps, Laryngeal cyst, Granuloma, Reinke's edema, recurrent respiratory papillomatosis, vascular lesion, Vocal sulcus, and chronic hypertrophic laryngitis. The incidence of benign laryngeal lesion is continuously increasing due to modern life style and stress. It has been noted that vocal cords are more prone to vocal abuse, atmospheric pollution, smoking and consumption of alcohol, dust and fumes, allergy and gastro esophageal reflux, upper and lower respiratory tract infections and caffeine intake. The professional voice users, teachers, children, housewives, hawkers, shopkeepers, singers are susceptible groups to benign laryngeal lesion [3].

The complete evaluation of benign laryngeal lesion is done by detailed history including complete medical history and voice history, indirect laryngoscopy, rigid oral endoscopy by 70° and 90° endoscopes, flexible fiber optic nasopharyngo laryngoscopy. Various other techniques have been developed to diagnose the laryngeal lesion or to understand the problem arising during voice production. The techniques are high speed photography and digital imaging, strobovideo laryngoscopy, videokymography, glottography and electroglottography, laryngeal electromyography and acoustic voice measurement [4].

All the patients of benign laryngeal lesion were managed with conservative management including avoidance of predisposing factor like smoking, alcohol, vocal abuse and treatment of sino nasal problem, laryngopharyngeal reflux, acute and chronic respiratory infections, and mental stress. Before surgery minimum two month trial of voice therapy including hydration and avoidance of vocal abusive behavior, education regarding vocal hygiene is considered. Those patient not improved in spite

of conservative management were considered for surgery. The operative technique includes micro laryngeal surgery which opened wide horizons and has wide variety of procedural options [5].

Micro laryngeal surgery has added new dimensions to the diagnosis and treatment of a number of laryngeal lesions. It provides magnification, brilliant illumination and opportunity for bimanual instrumentation, photography and teaching. The technique has proved to be of great importance in the early diagnosis of carcinoma and in the establishment of the exact extent of the tumors. Principle of micro laryngeal surgery to preserve the uninvolved epithelial covering, while removing underlying lesion using the conservative approach with little or no trauma to the normal mucosa and superficial layer of lamina propria. The most widely used techniques include conventional cold steel dissection (micro instrumentation) and the carbon dioxide (CO_2) laser. Micro laryngeal surgery is vitally important to the management of vocal fold pathology and in achieving maximal voice improvement. Postoperative care and pre and postoperative speech therapy substantially improved the results.

Aims and Objectives

1. To categorize the various benign appearing lesions of the larynx.
2. To correlate the various clinical, micro laryngoscopic and histopathological features.
3. To evaluate the age incidence, sex ratio, occupational factors in various benign laryngeal lesions.
4. To evaluate the role of micro laryngeal surgery in benign laryngeal lesion.

MATERIALS AND METHODS

This is a prospective study involving patient with apparently benign looking lesion not improved after two month of conservative treatment including medical treatment, avoidance of risk factors and voice therapy. 50 cases presenting with apparently looking benign laryngeal lesion were selected and subjected to micro laryngeal surgery in the Department of the Otorhinolaryngology, RNT Medical College, Udaipur (Rajasthan).

All patients posted for micro laryngeal surgery underwent thorough history including medical and voice history, detailed clinical examination including medical and ear, nose and throat examination, and voice assessment. All patients were postoperatively followed up at one week, one month, and two month. Perceptual voice assessment was done by patient and his/her relatives and pre and postoperative comparison was done.

Inclusion Criteria

1. Patients with history of hoarseness / change in voice with apparently benign looking lesion whose voice not improved by two months of conservative treatment, medical treatment, and voice therapy.
2. Patients of benign laryngeal lesion fit for micro laryngeal surgery under general anesthesia.

Exclusion Criteria

1. Non-operable cases.
2. Cases with clinical diagnosis of malignancy of larynx.
3. Cases improved by medical treatment and voice therapy.
4. Cases unfit for surgery.
5. Cases with inflammatory lesion. Patient with speech defect due to central nervous system lesion, patient with oral and speech defect.

Surgical Preparations

Pre-operative Evaluations

Patient with apparently looking benign laryngeal lesion posted for micro laryngeal surgery was first examined in outpatient department. Detailed history including medical history and voice history was taken that includes detail of symptoms impacting the voice and laryngeal functions, vocal hygiene, vocal abuse, and ascertaining the presence of known risk factors for voice pathology. General medical history was taken that may affect their fitness for surgery and their treatment plan. The clinical examinations includes indirect laryngoscopy, oral rigid endoscopy by (90° and 70°) endoscopes and flexible fiber optic nasopharyngolaryngoscopy. Other diagnostic modalities, like ultrasound, computed tomography were used if required. Patients posted for micro laryngeal surgery under general anesthesia were advised nothing per oral for 6 hours before surgery. Sensitivity test for local anaesthesia was done. Informed risk consent was taken regarding surgical and anaesthetic complications.

Anesthesia

All patients were operated under general anesthesia with small sized cuffed endotracheal tube size usually 5 mm to 6 mm inner diameter.

Surgical Technique

Patient was placed supine on the operation table, the head is extended at the atlanto-occipital joint, and neck is flexed on the chest

(morning sniffing, Boyce-Jackson position achieved). Lips, teeth's and alveolar ridge were protected by wet cotton gauze. The largest size Kleinsasser suspension laryngoscope that can comfortably fit is inserted per oral into the larynx and then degree of exposure of vocal folds and laryngeal structures is checked. The laryngoscope was attached to laryngeal suspension system and fixed with Reicker Kleinsasser laryngoscope holder and chest support placed over patient chest. Once the patient was suspended, external counter pressure was applied manually to determine its value for improving exposure. Then a 1 inch wide cotton cloth tape would be placed across the larynx at the level of cricothyroid membrane and then both ends of tape was attached to the side of operating table. The magnitude of the pressure and vector of the forces were adjusted to optimize the exposure of the lesion and the anterior glottis. Magnification was achieved with Karl Zeiss binocular operating microscope with a 400 mm objective. A tilt of 30° of the O.T. table was done to achieve maximum visualization, Microscope was connected to the video system for recording of surgical procedure.

The lesion was palpated with a blunt probe to assess its texture and depth of deep tissue involvement. Sub epithelial infusion of 1-2 ml of lignocaine 2% + adrenaline (1:100000) in to the superficial lamina propria was used in most of the glottal lesions. Infusion was done by 27 gauge needle fitted with long canal. The lesion was grasped by microsurgical cup forceps on the free edge, taking care not to include underlying lamina propria so as not to disturb normal tissue surroundings the lesion of vocal folds as possible. Then it was stretched medially and excised by micro scissors without damaging underlying structures and deep lamina propria. After the excision of lesion the edges of remaining redundant mucosa was trimmed to produce a smooth and straight vocal fold edges. Hemostasis was achieved by topical application of adrenaline (1:1000) soaked cottonoids over raw surface of surgical wounds. When surgery was completed, any residual blood or secretions in the laryngeal introitus or hypopharynx were sucked. Then laryngoscope was removed safely under vision not to injure vital structures. Biopsy was sent for histopathological examination report and later assessed for the type of lesion and especially for any sign of malignancy.

Post-Operative Care

1. Voice therapy: including absolute voice rest for 2 days then relative voice rest for 7 days, after 7 days gradual increasing use of voice was allowed, after 4 weeks complete use of voice was permitted. All patients were trained regarding vocal hygiene, including voice rest, adequate hydration, the reduction of laryngeal irritants, avoidance of vocal abuse and hard glottal attacks, reduction of vocal loudness and speech rate, and elimination of chronic throat clearing and coughing. Vocal resonance exercise, such as humming, and yawning and lip buzzing, and relaxation exercises that aimed to release musculoskeletal tension in the shoulders and neck were also taught.
2. Medication: steroid for 2 weeks in tapering dose, analgesic for 1 week, proton pump inhibitor for 1 month was advised.
3. Avoid straining and hard work for 1 month. Smoking, caffeine, alcohol, and spicy food, ice cold or extremely hot liquid and food intake were avoided.

Follow-up

Patients were followed up at one week after discharge and later on at one month and two month. A proforma was made for all patients to collect data and analysis.

OBSERVATION AND RESULTS

In the study, majority of patients were males 38 (76%) in number and 12 cases were females that accounts for 24%.

Out of 50 cases, 28 cases (56%) were from rural area and 22 cases (44%) were from urban area.

The free margin of vocal cord was the commonest site of origin of these lesions in 72%, followed by anterior commissure in 28% cases.

Farmers, housewives, labourers were mostly found with benign laryngeal lesions, while pensioners, imams, and preachers had the least incidence. Majority of the patients in this series, i.e., about 70%, belonged to occupations well known for excessive vocal use, such as housewives, labourers, shopkeepers, businessmen, politicians, and teachers.

Table 1: Patient Distribution under Different Types of Benign Tumor of the Larynx According to Age

Type of Lesion	Males	Females

	21–30	31–40	41–50	51–60	61–70	21–30	31–40	41–50	51–60	61–70
Vocal nodule	4	6	3	0	1	4	1	0	1	0
Vocal polyp	2	4	3	3	1	1	1	1	0	0
Vocal cyst	0	2	1	0	0	0	0	0	1	0
Keratosis	0	0	2	1	0	0	0	0	0	0
Reinke's edema	0	0	2	0	0	0	0	1	0	0
Squamous hyperplasia	0	0	1	0	0	0	0	0	0	0
No evidence of tumor	0	0	0	0	0	0	0	1	0	0
Cavernous haemangioma	1	0	0	0	0	0	0	0	0	0
Saccular cyst	1	0	0	0	0	0	0	0	0	0

Out of 50 cases, 20 cases (40%) had vocal cord nodule, 16 cases (32%) had vocal polyp, 4 cases (8%) had vocal cyst, 3 (6%) cases each have Keratosis and Reinke's edema and 1 (2%) case of each have cavernous haemangioma, saccular cyst and squamous hyperplasia. Vocal nodule 20 (40%) is the most common lesion in both sexes.

Table 2: Distribution of Cases According to the Nature of Lesions

Non Neoplastic			**Neoplastic**		
Lesion	No.	%	Lesion	No.	%
Vocal Nodule	20	40	Cavernous Haemangioma	1	2
Vocal Polyp	16	32	Squamous Hyperplasia	1	2
Vocal Cyst	4	8			
Reinke's Edema	3	6			
Keratosis	3	6			
Saccular Cyst	1	2			

The study shows that most of the lesions were non-neoplastic — 94%, while 4% were found to be neoplastic.

Amongst the non-neoplastic benign lesions, vocal nodules were most common (40%), followed by vocal polyps (32%).

Table 3: Complications

Minor Complications							**Major Complications**
Dental Injury	Mucosal Injury	Throat Pain	Tongue Injury	Vocal Cord Scar	Recurrence	Residual	
0	2	1	0	0	0	0	0

Minor complications were found in 3 (6%) cases, while major complications were not found in any case.

Table 4: Perceptual Voice Assessment at 2 Months Postoperatively

Type of Lesion	**Normal**	**Improved**	**Unchanged**	**Worse**	**Total**
Vocal nodule	19	1	0	0	20
Vocal polyp	16	0	0	0	16
Vocal cyst	4	0	0	0	4
Keratosis	1	1	1	0	3
Reinke's edema	1	2	0	0	3
Squamous hyperplasia	1	0	0	0	1
Cavernous haemangioma	1	0	0	0	1
Saccular cyst	1	0	0	0	1
Diagnosis not made	1	0	0	0	1
Total	45	4	1	0	50

Majority of the patients, 45 (90%), achieved normal voice, 4 (8%) of patients' voice improved, and only 1 (2%) patient's voice remained unchanged.

Table 5: Diagnostic Efficiency of Various Diagnostic Modalities

Methods of Diagnosis	Number of Cases	Percentage
Indirect Laryngoscopy	27	54%
Hopkin's (70° and 90° scopes)	46	92%
Microlaryngoscopy	50	100%

Indirect Laryngoscopy could diagnose only 27 (54%) cases, while in 46 (92%) cases diagnosis was made by Hopkin's (70° and 90° scopes), and 50 (100%) cases were diagnosed by Microlaryngoscopy.

DISCUSSION

The clinical study of 50 patients of benign lesion of larynx was carried out at R.N.T. Medical College and associated group of hospitals, Udaipur who were admitted in our Otorhinolaryngology ward.

Incidence:

In our study, out of 50 cases 47 (94%) were non-neoplastic while 2 (4%) were neoplastic. The ratio between two was 23.5:1. Similar was the observation of Hegde MC et al (2005) [6] and Singhal P et al (2005) [7] who reported the ratio of 42:1 and 23:1 in their respective studies. The variation in the ratio of non-neoplastic and neoplastic in various studies could be due to different environmental and social factors and possibly because of the greater number of cases (Sellars, n = 743) studied by them as compared to our study (n = 50).

In the present study, it has been observed that males 38 (76%) were more commonly affected as compared to female 12 (24%), male to female ratio being 3.16:1. The findings are similar to that with Singhal P et al (2005) [7] and Hegde MC et al (2005) [6]. They observed male to female ratio of 3:1 and 2.72:1, 2.5:1 and 2.82:1 in their respective studies. This may be attributed in males to their increased environmental exposure, enthusiastic outdoor activities, ease of seeking medical advice and personal habits like smoking and alcohol consumption.

Age is not found to be a bar as the study involved individuals of all age groups. The benign laryngeal lesions were commonly found to be in third to fifth decade of life out of 50 cases 43 (86%) were between the ages of 20 to 50 years of age. The youngest patient was 21 year old house wife and oldest patient was 66 year old politician. Chopra H and Kapoor M in 1997 [8] found out 67 of patients, 49 (73.14%) of patients were between 20 to 50 years age group. It is known that individuals in younger age group are more ambitious, active and use their vocal skills maximally.

Socioeconomic Status

In our study 32 (64%) patients belonged to middle socioeconomic status families followed by 13 (26%) from lower socioeconomic status families and only 5 (10%) were from high socioeconomic status families. Strong MS and Vaughan CW (1982) [9] were supported the same and found 85% of cases were low to middle class families. The possible reason for such high incidence in low or middle class families could be due to overcrowding, exposure to environmental hazards, vocal abuse and low immunity. Furthermore their profession also requires excessive speaking or yelling.

Predisposing Factors

In our study, 32 (64%) cases had history of vocal abuse followed by smoking in 20 (40%) cases, chronic respiratory infection in 12 (24%) cases, gastro oesophageal reflux in 8 (16%) and mental stress in 7 (14%) cases, alcohol in 6 (12%) and environmental pollution in 5 (10%) cases, allergy in 4 (8%) and Sino nasal disease in 3 (6%) cases. Chronic mucosal irritation by heavy smoking, excessive intake of alcohol and tobacco chewing in Asian countries play significant role in etiology of hoarseness. It was observed that in India and other developing countries the prevailing lower socio economic status, poor nutrition, poorer general health, different food habits, vocal habits, smoking and drinking habits, unhealthy environment, and different social customs influence the incidence of hoarseness as per Parikh [10]. Secondary influences such as smoking, infection, allergy, acid reflux may also increase the mucosa's vulnerability to the kind of injuries that may occur during mucosal oscillation [11].

Vocal abuse: In the study, 64% cases has history of vocal abuse. Also it was found that occupational status has direct bearing on the degree of vocal abuse. In our study, out of 50 cases 12 cases were farmers, 10 were

housewives and 6 were labourers, 5 were shopkeepers and 3 were businessmen. In our study 70% of patients belonged to occupations well known for excessive voice use. The voice misuse/abuse is very common in professionals like singers, teachers, door to door vendors and people working in noisy environment.

Smoking

In our study out of 50 cases 20 (40%) were found to be smokers. Oskar Kleinsasser (1982) in a series of 900 patients of vocal cord polyps which were removed by endolaryngeal microsurgery of all these patients, 80–90% were smokers. In terms of smoking, tobacco chewing, alcohol intake, findings in our study was comparable to studies done by Buche et al [12], Banjara et al [13] and Wani et al [14].

Site of Lesion

In our study, it has been observed that lesions like Vocal nodule, Reinke's edema and Keratosis occur mostly bilaterally while vocal polyps and cysts occur commonly unilaterally. The observation is in concordance with Kambik V (1981) [15] who found that 90% of vocal polyps were unilateral. Vocal nodules were commonly seen at the junction of anterior one-third and posterior two third of vocal cord. This is the point of maximum amplitude of vibration and thus the site of strongest mechanical irritation.

Diagnosis

Diagnosis was made by history, clinical examination and examination by indirect laryngoscopy, Telescope (by Hopkins's 70° and 90° scopes) and microlaryngoscopic examination. In our study Indirect laryngoscopy can diagnose 27 (54%) of cases, 46 (92%) cases were diagnosed by 90° endoscope and in all 50 (100%) cases diagnosis was made by micro laryngoscopy. Batra K et al (2004) [16] attempted indirect laryngoscopy in 100 cases of hoarseness of voice but could not be performed in 38 cases. Common causes of inability to perform indirect laryngoscopy were anatomical position of base of tongue, soft palate and epiglottis, hyper-reflexive gag reflex and anxious uncooperative patient.

In our study we found a high correlation between clinical and pathological diagnoses in 46 (92%) cases. Similar was the observation of Wallis L (2004) [17] and Nunes RB (2013) [18]. In their study they respectively found 91.5% and 93.18% correlation between clinical and pathological diagnoses. Pathologically differential diagnosis between nodules and polyp is most difficult to perform in laryngeal biopsies and therefore must be made by means of an interactive relationship between the clinician and the pathologist. However Kambik V (1981) [15] concluded the distinction between a polyp and a nodule is only a matter of opinion, since histologically both produce identical changes.

Treatment

In our study the treatment approach for these lesions is fairly standardized, given that most patients should receive non-surgical treatment for these lesions, which consist of medical therapy for comorbid medical conditions (e.g., allergies, laryngopharyngeal reflux and acute and chronic respiratory infections) and behavioral therapy of the voice consisting of voice therapy and voice rest. Those patients who do not improve in spite of conservative treatment would be considered for surgery. The surgical treatment for various benign lesions of the larynx depends on the nature and extent of lesion. This technique leads to faster healing and thus there is no need for secondary reepithelialization. In a narrow pedunculated polyp, a simple superficial excision with minimized epithelial loss is generally sufficient. To accurately achieve these goals, however, high-powered binocular visualization and delicate microlaryngeal instrumentation is required.

The lasers used are usually carbon dioxide. The principle involves hemostasis of the microcirculation and sealing of lymphatics while preserving the adjoining healthy tissue. Recent advances include the application of anlyolytic lasers especially thulium laser and the 532nm pulsed KTP laser.

In our study all patients were operated under general anaesthesia with small sized endotracheal tube usually 5mm to 6mm inner diameter. In most of the lesions sub epithelial infusion of 1-2ml of lignocaine 2% + adrenaline (1:1000) was used. Lesion was excised by microsurgical instrument without damaging underline structures and deep lamina propria. After the excision of lesion the edges of remaining redundant mucosa was trimmed to produce a smooth and straight vocal cord edges. Hemostasis was achieved by topical application of adrenaline soaked cotonoids over raw surface of surgical wounds.

Complications

In our study we did not encounter any major complication. However, minor complications in the form of mucosal injury (2 case) and injury to tongue (1 case) were observed. The observation is in accordance with study of P. Kitzing et al (1987). They also did not have any major complication. However, minor

complications in the form of tooth injury (1%), submucosal haematoma in pharynx/gingival (1.8%) were observed.
On other hand Klussman et al (2002) observed minor mucosal injury in 75% of the patients after suspension laryngoscopy.

CONCLUSION

Benign laryngeal lesions are not uncommon conditions. Benign laryngeal lesions are prevalent in all age groups but more common between 20 to 30 years of age group. Vocal cord nodule and polyp are the most common encountered benign laryngeal lesions. Males are more affected with these lesions. Synergistic effect of vocal abuse, smoking and chronic respiratory tract infections, gastro oesophageal reflux, alcohol, atmospheric pollution and allergy, mental stress and sino nasal disease are the contributing factors for development of benign laryngeal lesions.
The benign laryngeal lesions produce symptoms which can be from mild hoarseness to life threatening stridor. Benign laryngeal lesions can create a lot of mental and emotional stress in the patient and their family. The mainstay of diagnosis of benign laryngeal lesions was thorough medical and voice history and complete E.N.T. examination, followed by perceptual assessment of the voice. Diagnostic laryngeal endoscopy is a crucial part of the evaluation in the patients of benign lesion of larynx. Most patients of benign tumor of larynx require a combination of laryngeal endoscopy techniques: rigid oral endoscopy and transnasal flexible fiber optic endoscopy for a detailed visualization and analysis. Micro laryngoscopy has definite edge over other diagnostic modalities. Micro laryngoscopy, voice therapy and avoidance of known risk factors offer a cost-effective, useful and safe method for the management of benign laryngeal lesions.

REFERENCES

1. Zhang Z. Mechanics of human voice production and control. J Acoust Soc Am. 2016;140(4):2614
2. Hegde MC, Kamath MP, Bhojwani K, Peter R, Babu PR. Benign lesions of larynx-A clinical study. Indian J Otolaryngol Head Neck Surg. 2005;57(1):35-8
3. Robin PE, Olofsson J. Tumours of the larynx. In: Hibbert J Laryngology and head and neck surgery, 6th edn. Heinemann International, Great Britain, 1997.
4. Johns MM. Update on the etiology, diagnosis andtreatment of vocal fold nodules, polyps and cysts. CurrOpinOtolaryngol Head Neck Surg 2003; 11(6):456–61
5. Campagnolo AM, Priston J, Thoen RH, Medeiros T, Assunção AR. Laryngopharyngeal reflux: diagnosis, treatment, and latest research. Int Arch Otorhinolaryngol. 2014;18(2):184-91
6. Hegde MC, Kamath MP, Bhojwani K, Peter R, Babu PR. Benign lesion of larynx-a clinical study. Indian Journal of Otolaryngology and Head and Neck Surgery 2005;57(1):35-38
7. Singhal P, Bhandari A, Chouhan M, Sharma MP, Sharma S. Benign tumors of the larynx: a clinical study of 50 cases Indian J Otolaryngol Head Neck Surg 2005;61 (suppl): 26-30
8. Chopra H, Kapoor M. Study of benign glottic lesion undergoing micro laryngeal surgery. IJO and HNS. 1997;49(3):276-279
9. Strong MS and Vaughan CW. Vocal cord Nodules and polyps, the role of surgical treatment. Laryngoscope 1971;911-923
10. Parikh N. Aetiology study of 100 cases of hoarseness of voice. Indian J Otolaryngol Head Neck Surg. 1991;43(2):71–73
11. Bastian Robert W. Benign vocal fold mucosal disorders Cummings otolaryngology head and neck surgery. 4. Philadelphia: Mosby Elsevier; 2005. p. 2150
12. Buche RA, Garud SH, Jaiswal SA, Chamania GA. Benign lesions of larynx—a clinicopathological study. IOSR J Dent Med Sci. 2016;15:09–17
13. Banjara H, Varsha M, Singh D, Gupta A. Hoarseness of voice: a retrospective study of 251 cases. Int J Phonosurg Laryngol. 2011;1(1):21–27
14. Wani AA, Rehman A, Hamid S, Akhter M, Baseena S. Benign mucosal fold lesion as a cause of hoarseness of voice—a clinical study. Otolaryngology. 2012;2:120
15. Kambic V, Radsel Z, Zargi M, Acko M. Vocal cord polyps: incidence, histology and pathogenesis. J Laryngol Otol. 1981;95(6):609-18
16. Batra K, Motwani G, Sagar PC. Functional voice disorders and their occurrence in 100 patients of hoarseness as seen on fibreoptic laryngoscopy. Indian J Otolaryngol Head Neck Surg. 2004;56(2):91-5

17. Wallis L, Jackson-Menaldi C, Holland W, Giraldo A. Vocal fold nodule vs. vocal fold polyp: answer from surgical pathologist and voice pathologist point of view. J Voice. 2004;18(1):125-9

18. Nunes RB, Behlau M, Nunes MB, Paulino JG. Clinical diagnosis and histological analysis of vocal nodules and polyps. Braz J Otorhinolaryngol. 2013;79(4):434-40