INTRODUCTION

Voice is the medium through which verbal communication happens. Thus, it reflects the importance. Voice is produced by vibration in vocal cord which is modified by articulation producing speech. Voice disorder is defined by change in pitch, quality, and loudness which is inappropriate for the age and gender. As per the American Speech Language Hearing Association, its prevalence is 3–9% and is affected by age, gender, and occupation. It is important to know that voice disorder is different from speech disorder which comprises disorder in articulation basically.

Voice disorder comprises as one the common complaints in patients visiting to otorhinolaryngology outpatient. The common causes for voice change are laryngopharyngeal reflux (LPR), laryngitis, vocal cord paralysis, tumor, vocal nodule/cyst/poly, and functional. Detailed history, clinical evaluation, laryngoscopy, and stroboscopic examinations are key components in the evaluation. In laryngoscopy, fiber-optic evaluation is most commonly performed in view of rapid, evaluating the larynx in normal anatomic position, option of narrow-band imaging in doubtful malignant cases for suspicion and able to take biopsy. Conservative management, voice therapy, and phonosurgery are common methods of treatment depending on the etiology.

We aimed the study with intention of revealing spectrum of voice disorders and their management option from...
MATERIALS AND METHODS

It is a prospective study conducted between June 25, 2020, and November 30, 2021. All patients visiting to our outpatient with complaint of voice change and consenting for the study were enrolled. We enrolled the patients till August 31, 2021, so that minimum 3 months follow-up could be recorded. Clinical, demographic profiles were recorded. Fiber-optic laryngoscopy was performed in all the cases. Radiology examination computed tomography/magnetic resonance imaging was supplemented only in required cases. Biopsy was performed in suspected malignant cases before proceeding definitive treatment. Microlaryngeal surgery (MLS) was performed for vocal cord leukoplakia, polyp, and cyst.

Laryngectomy (total) was performed in advanced stage laryngeal cancer. Anti-reflux medication was prescribed in LPR. Voice therapy and lifestyle modifications were advised in all patients. Minimum 3 months follow-up was collected in all patients post-definitive therapy. Only those patients benefitted from our treatments were included in the study. Ethical approval was obtained from the Institute Ethical Committee before this study. Statistical analysis was performed using Statistical Package for the Social Sciences version 24. Pearson Chi-square test was used for see the association between parameters. P-value was considered significant while being <0.05.

RESULTS

Out of 218 patients, the most patients (approx. 70%) occupied in the age group of 30–50 years and the least common was beyond 60 years of age. There was male predominance (76.6%) (Table 1).

Most of the patients visited with complain of voice change was due to LPR which was noticed in 56.4% of cases. Benign vocal fold lesions (nodule/cyst/polyp) were noticed in 26.5% of cases. Malignant lesions were seen in 1.8% of cases (Table 2).

Benign vocal fold lesions (polyp and cyst) were treated by MLS with cold instruments. Similarly, pre-malignant lesion (leukoplakia) was treated with MLS stripping. Out of four malignant lesions, one was in early stage and underwent supraglottic laryngectomy while others were in advanced stage (T4) and treated by total laryngectomy followed by adjuvant radiation treatment. Since, radiotherapy facility was not available in our center, we have referred them (Table 3).

We had evaluated any association of benign vocal fold lesions with a history of voice overuse, smoking, and alcohol. Nodule was seen in association with voice overuse (P≤0.001) while smoking use and alcohol use were not (Table 4).

DISCUSSION

Voice change complain drives the patients to visit otorhinolaryngology specialist. It can be intermittent or persistent. Intermittent voice change is mainly associated with vocal unhygiene practices such as overuse/misuse or LPR. In our study, reflux (LPR) was noticed in 56.4% while vocal nodule in 21.5% of cases. A study by Koufman et al., LPR was seen in 50% of cases who visited the center with voice change. A study from Nepal by Singh et al., they...
found vocal nodule as a cause for hoarseness in 38.9% of cases.\textsuperscript{23,24} The difference in magnitude is may be because of patient enrolled variation. Vocal hygiene practices are key therapeutic approach in vocal nodule management which is noticed in professional voice users. Anti-reflux medication and proton-pump inhibitor (PPI) are needed in treating reflux apart from dietary and lifestyle modification. Mostly, long-term use of PPI for around 8–12 weeks is required. Persistent hoarseness is mainly because of benign vocal fold lesion such as cyst or polyp, premalignant lesion such as leukoplakia or erythroplakia, and neoplastic growth. In our cases, magnitude of these cases was 5.0%, 2.3%, and 1.8%, respectively. Our study is supported by the literatures.\textsuperscript{25,26} Benign or premalignant lesions need MLS biopsy for treatment. Malignant lesion is treated by surgery or radiation/chemoradiation or both depending on the stage. In our study, one case was in early stage (T2) and underwent supraglottic laryngectomy for treatment while three cases were in advanced stages (T4a) and treated by total laryngectomy with neck dissection followed by adjuvant radiation therapy. Sometimes, non-organic functional cause is also seen, especially in emotionally labile young women.\textsuperscript{27} We noticed in 4.7% of cases. These patients require mostly require mostly placebo like therapy in the form of laryngeal massage, PPI apart from reassurance. Vocal fold paralysis either idiopathic or post-thyroid surgery is also encountered not uncommonly and needs to rule out other causes before assuming as idiopathic.\textsuperscript{28} Most of time, it is because of viral infection and reversible. In our cases, 6.9% of cases had idiopathic vocal fold paralysis and 1.4% had secondary to malignant thyroid surgery. We managed all such patients with voice therapy except one in which type 1 thyroplasty was executed.

We kept follow-up for at least 3 months in all cases after treatment and improvement of voice was satisfactory except in malignant cases that underwent total laryngectomy (three cases) who are disease free till now and planned for secondary tracheoesophageal prosthesis for voice rehabilitation.

Our center is being the largest tertiary care center in East Nepal, we encounter huge number of patients with voice change complain. Hence, we conducted the study with intention of revealing spectrum of voice disorders and their management option. The limitation of our study is subjective measurement for voice improvement after therapy and lack of stroboscopic evaluation.

### CONCLUSIONS

Spectrum of voice change is wide and comprises reflux to malignant lesion. Hence, proper evaluation with laryngoscopy is pinpointed in deciding the treatment plan. Most of the patients have good response with treatment if properly consecuted. Dietary modification, lifestyle change, and voice hygiene practices with PPI cover the major treatment bulk. Surgical treatment in the form of MLS is usually for benign or premalignant lesion while laryngectomy for malignant lesion. Voice framework surgery has also revealed very promising outcome in those not benefitted with conservative management.

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### REFERENCES


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RT- Concept, design of the study, preparation of manuscript draft, statistical analysis, result interpretation, and review of literature; SKT- Coordination, review of literature, and manuscript preparation

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