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Role of stroboscopy in diagnosis of laryngeal disorder

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ABSTRACT

Background: Laryngeal disorders are the main culprit for change of voice. Patient presenting with change of voice needs to be assessed for laryngeal disorder. Larynx being part of hypopharynx in the deeper part of cavity has been difficult organ to examine since long, but with technological evolution from artificial light to flexible scopes to stroboscope has made life easier for a laryngologist to evaluate laryngeal disorder thoroughly.
Methods: In this study we have included all cases of change of voice coming to department of ENT and head and neck surgery at GMERS Medical College and Hospital, Gotri in last one year with change of voice for more than one month including vocal cord malignancy. A detailed history and thorough examination of ENT and in particular larynx done. Further work up and management was done according to case base need.
Results: Out of 50 patients enrolled in the study we found 48% males and 42% females. Most of the patients were adults. Only 4% were in geriatric age group. Most common diagnosis was vocal cord nodules 26% followed by hypertrophy of vocal cords16%. Malignancy of the vocal cords was found to be 14% followed by10% of vocal cord polyp and vocal cord palsy 10%. Other conditions were found to be 6%.
Conclusions: Stroboscopy is a great tool for evaluation of vocal cord pathology in particular subtle diseases of vocal cords. Along with diagnosis we can have proper documentation of dynamic movement of vocal folds with help of stroboscopy.

Keywords: Stroboscopy, Laryngeal disorder, Vocal cord nodules

INTRODUCTION

Change in voice is the most common symptom of laryngeal pathology.[1] Ever since Manual Garcia in 1854 first observed his own vocal cord movements using laryngeal mirror and sun light a number of techniques have evolved and understanding of laryngeal pathologies been made more comprehensive and interesting.[2,3] Over this period of time we have introduced various methods of laryngeal examination from indirect laryngoscopy to stroboscopy.[4] Indirect laryngoscopy, it is an office procedure done using indirect laryngoscopy mirror for examining larynx and vocal cords with advantage of being ease of access and minimum requirement of any specific instrument but with disadvantage of illumination, narrow field of vision and no possibility of documentation. While Endoscopic rigid laryngoscopy also an office procedure done using angled laryngoscope (70^0 or 90^0) gives good illumination and wide field of vision with recording and demonstration facilities but it requires special setup. Another disadvantage of this technique along with indirect laryngoscopy is that we require patient co-operation. As well as the larynx is evaluated in elevated position and not in its physiological position. This can be done with flexible laryngoscopy which can also be done as an office procedure in which we can assess the larynx during phonation in its physiological position. Disadvantage with flexible being lower quality image compared to rigid endoscopes. In all this technique we get real time assessment of the larynx,

while in stroboscopy which is also an office procedure we can assess movement and vibration of vocal folds in detail and we can also document. Principle of stroboscopy, it involves use of high speed flashes of light at a frequency slightly lower or higher than the frequency of vocal fold vibrations of patient.[2,5,6] The image thus obtained appears to be a slow motion view of vocal fold vibration.[6,7]

METHODS

The present study is of 50 patients coming to the Department of E.N.T and Head and Neck Surgery in GMERS Medical College, Gotri, Vadodara. The study was conducted between January 2018 and January 2019. Those patients who fulfilled the inclusion criteria were enrolled in the study. Detailed history and clinical examination was done including stroboscopy. Patients were analyzed on the basis of stroboscopic findings and their age of presentation. All patients with age above 10 years with hoarseness of voice for more than 1 month are included in the study. While previously operated, diagnosed with neurological disorder or cardiovascular disorder, pregnant or lactating mothers were excluded from the study group. All patients were analyzed based on age, sex and pathology responsible for change of voice.

RESULTS

In our study of patient suffering from laryngeal disorders we found 29 males (58%) and 21 females (42%). Most of the patients were adults distributing them further decade wise it was found that maximum patients were in the 3rd decade (Table 1).

We also found out that from 50 patients 13 had vocal cord nodules while 8 had vocal cord hypertrophy and 7 had irregularity of vocal cord (Table 2). This shows that 86% of the patients had benign lesions of vocal cords and 14% had malignancy of vocal cords. Vocal cord nodules were seen in 9 females and 4 male patients (30% of all bengn lesions). Hypertrophied vocal cords were found in 4 males and 4 females (9% of benign lesions). Carcinoma was found in 7 males that too in 5th and 6th decade of life. Vocal cord palsy was seen in 5 patients (11%) and similarly vocal cord polyp was also found n 5 patients (11%). Other benign conditions had 3% occurance like bowing of vocal cords, vocal cord polyp, vocal cord cyst and leukoplakia.

Table 1: Age and sex wise distribution.

Age (in years)	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	>60	Total
Male	-	2	8	8	8	3	29
Female	1	7	9	3	1	-	21
Total	1	9	17	11	9	3	50

Table 2: Incidence of diagnosis with age and sex wise distribution.

Diagnosis	Age (in years)						
	Total	**11 to 20**	**21 to 30**	**31 to 40**	**41 to 50**	**51 to 60**	**>60**
Vocal cord polyp	5	0	1 (1F)	1 (1M)	1 (1M)	2 (2M)	0
Vocal cord nodule	13	1 (1F)	3 (3F)	6 (2M, 4F)	2 (1M, 1F)	1 (1M)	0
Vocal cord palsy	5	0	1 (1F)	2 (1M, 1F)	2 (1M, 1F)	0	0
Hypertrophied vocal cords	8	0	1 (1M)	4 (4F)	2 (2M)	1 (1M)	0
Iregularity of vocal cords (carcinoma)	7	0	0	0	1 (1M)	4 (4M)	2 (2M)
Bowing of vocal cords	3	0	1 (1F)	2 (1M, 1F)	0	0	0
Congestion of vocal cords	3	1 (1M)	2 (1M, 1F)	0	0	0	0
Vocal cord cyst	3	0	2 (1M, 1F)	1 (1M)	0	0	0
Leukoplakia	3	0	0	0	2 (2M)	0	1 (1M)

DISCUSSION

From this study we can say that stroboscopy is a good evolving tool for various voice abnormalities. In this study 50 patients were included of either gender with different vocal cord pathologies. Our study showed 42% females which was similar to the study carried out by Baitha et al.[8] Age wise distribution shows 32% were in the 3rd decade and only 4% were in geriatric age group. This may be because of occupation.[9] Analysis of diagnosis showed majority 26% were having vocal cord nodule which is in accordance with the study done by Shin, Chang and Yang showed 20% having vocal cord nodule.[10] Our study showed 58% of patients having vocal cord nodule in 4th and 5th decade. It is observed that vocal cord nodules were common in patients having voice abuse. In professions like teachers, professors and vendors there is lot of voice abuse leading to hoarseness of voice and bilateral vocal cord nodules especially in the 3rd decade. This is when they are professionally more

active. They were also found to be more common in females in the 2nd and 3rd decade.

Malignancy of vocal cords was found in males especially in the later age group especially in the 5th and 6th decade.

CONCLUSION

The present study was carried out in our hospital in which 50 patients of either gender and with different vocal cord pathologies were included. Highest incidence was found of bilateral vocal cord nodules (26%). Mostly all patients were in the 3rd decade. Malignancy of vocal cords was found in males (14%) mostly in 5th and 6th decade. All of them were diagnosed on basis of stroboscopy findings.

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