

ORIGINAL RESEARCH

Microlaryngoscopy and Anaesthetic Challenges: A Hospital based Study

Karuna Kumar Das¹, Pradip Kumar Tiwari², Debajit Das³, Arnav Das⁴

ABSTRACT

Introduction: Dysphonia is the main symptom of lesions that affect the larynx. Many of those require surgical treatment. Vocal cord lesions are the most common and the most prevalent indication for laryngeal microsurgery. Vocal cord dysfunction presents as a unique challenge to the anesthetists. To conduct a study of laryngeal lesions and their management by microlaryngoscopy along with the anaesthetic challenges met.

Material And Method: A total of 147 patients were studied and out of which 20 were operated under general anaesthesia during the study period (jul14 - jun15). All the patients were examined for the results.

Results: Patients undergoing microlaryngoscopy were diagnosed with vocal cord polyps, nodules, Reinke's oedema, keratosis, papilloma, fibroangioma, endocrine small cell carcinoma of vocal cord etc. Most of these patients were female as contrary to various studies where males were common. Microlaryngoscopic excision was both diagnostic and therapeutic and proved to be an important guide to the management of laryngeal pathologies. However, different anaesthetic complications were seen and dealt accordingly. Its unique treatment modalities must be implemented to avoid increased morbidity and possible mortality.

Conclusion: Vocal cord polyps were more frequently encountered. In addition, correlations between polyp type and sex, polyp size, position, type of carcinoma, its response to radiotherapy and speech therapy were observed. Different surgical techniques were used. The long term voice results following indirect microlaryngoscopic surgery demonstrated a statistically significant improvement for the maximum dynamic intensity range at habitual speaking pitch. All the anaesthetic complications were dealt accordingly and no mortality was seen.

Keywords: Microlaryngoscopy, Anaesthetic Challenges

How to cite this article: Karuna Kumar Das, Pradip Kumar Tiwari, Debajit Das, Arnav Das. Microlaryngoscopy and anaesthetic challenges: a hospital based study. International Journal of Contemporary Medical Research 2015;2(4):989-992

¹Assistant Professor, Department of Anaesthesiology, ⁴Resident, Department of Anaesthesiology, ²Resident, Department of Department of Otolaryngology and Head and Neck Surgery, ³Professor & Head of the Department of Otolaryngology and Head and Neck Surgery, Assam Medical College, Dibrugarh, Assam, India

Corresponding author: Pradip Kumar Tiwari, Resident, Department of Otolaryngology and Head and Neck Surgery, Assam Medical College, Dibrugarh, Assam, India

Source of Support: Nil

Conflict of Interest: None

INTRODUCTION

Direct examination of the larynx with the rigid laryngoscope, first performed by Kirsten in 1895, and standardized by Killian, the Santa Claus, early in the last century. Chance favors the mind prepared. Professor Seiffert accidentally found the the gallows of the Killian's apparatus supported the laryngoscope even after collapsing onto the chest. This discovery led to the birth of suspension microlaryngoscopy.¹ In 1953, the Zeiss operating microscope was introduced, Dysphonia is the main symptom of lesions that affect the vocal tract. More than 50% of individuals with voice disorders have benign alterations of the vocal fold mucosa. The study is important for the laryngologist not only for the symptoms they produce but also because of the necessity of distinguishing them from malignant lesions.^{2,3} Some of these tumors may even undergo malignant changes like papilloma (4%), granular cell-tumor (2%), keratosis, nodule, polyp, chronic hyperplastic laryngitis. Non-neoplastic lesions seem to be caused primarily by vibratory trauma (excessive voice abuse). Cigarette smoking, infection, allergy and gastric reflux are cofactors. Microlaryngoscopy has changed the whole perspective of laryngeal surgery. However, different anaesthetic complications should be borne in mind. Its unique treatment modalities must be im-

plemented to avoid increased morbidity and possible mortality.

MATERIALS AND METHODS

The main objective being to highlight the anaesthetic challenges for microlaryngoscopy in the management of laryngeal pathologies. A total of 147 patients were studied and out of which 20 cases were operated under general anaesthesia during the study period (Jul 14 – Jun 15). After approval from the institutional ethical committee and following written consent from each patient after having explained to them the study procedure in their own language, each of these patients was visited in the ward for pre anaesthetic check up in the evening before the day of surgery. A detailed history

was taken and thorough clinical examination was done. Each patient received bowel cleansing procedure and tablet alprazolam .5mg the night before surgery. Patients were kept nil orally for 8 hours before surgery. On arrival to the OT, the patients were positioned in the OT table. History recording and full clinical examination of the patients, examination of blood, sputum for AFB, plain X-rays, CT scan, MRI, ECG were done. The largest possible laryngoscope was used. The working distance was 20 cm.

STATISTICAL ANALYSIS

Results were generated based on descriptive statistics. SPSS version 21 was used to make tables.

RESULTS

Most common complaint was dysphonia (Table 1). Most common occupation was businessman (Table 2). Most common laryngoscopic finding was vocal polyp (Table 3). 20 patients went for microlaryngoscopy under general anaesthesia (Table 4).

Intraoperative And Anaesthetic Care

The patients showed the following findings

	Blood Pressure	Pulse rate	SPO ₂
Baseline	118/72 mm Hg	98	100%
After Induction	110/72 mm Hg	88	100%
After Intubation	118/74 mm Hg	92	100%
Intra-operative	98/60 mm Hg	72	100%

Premedication was given with Ramosetron---0.75 mg, Glycopyrolate---0.2 gm, Midazolam---2 mg, Fentanyl---100 µgm. Induction was done with Propofol---100mg and muscle relaxant for maintenance Succinylcholine- 90 mg. Patient was intubated with 7mm ET-Tube and given a loading dose of Atracurium of 30 mg after intubation. Anaesthesia was maintained with oxygen, nitrous oxide, isoflurane and atracurium. Reverse and extubate with Neostigmine – 2.5 mg and Glycopyrolate- 0.5 mg when patient was awake and responding to verbal commands.

Presenting symptoms	No of patients	%
Disorder of voice	147	100
Respiratory obstruction	121	82.31
Cough and expectoration	11	7.48
Repeated clearing of throat	86	58.50
Pain in throat	87	59.18
Dysphagia	69	46.93
Mass in the neck	79	53.74

Table-1: Chief complaints of patient

Occupation	No of patients	%
Housewife	50	34.01
Businessman	58	39.46
Student	2	1.36
Office worker	13	8.84
Teacher	6	4.08
Singer	3	2.04
Stage actor	2	1.36
Others	13	8.84
Total	147	100.00

Table-2: Occupational incidence table no

Disease	70° endoscopy	Anaesthetic complication
Vocal nodule	5	Surgical space reduction, possibility of tissue loss by friction injury
Vocal polyp	8	Surgical space reduction, possibility of laceration of the vocal cord
Reinke's oedema	4	Surgical space reduction, friction injury
Keratosis	4	Surgical space reduction
Subglottic growth	3	Surgical space reduction
NEC	2	Surgical space reduction

Table-3: Laryngoscopic findings

Disease	Patients undergoing MLS
Vocal nodule	5
Vocal polyp	8
Reinke's oedema	2
Keratosis	3
Subglottic growth	1
NEC	1

Table-4: Table on surgical procedure

Post-Operative Care

The voice of the patient was evaluated for further problems. Hydrocortisone- 100 mg was given once daily.

Outcome

All the patient received utmost care and needful treatment. The patient received surgical treatment. No recurrence was found.

DISCUSSION

In 1953, the Zeiss operating microscope was introduced, Kleinsasser (1961) revolutionized the diagnosis and treatment of a laryngeal lesion using microlaryngoscopy. He adopted the binocular Zeiss microscope to direct laryngoscope, using a 400mm objective lens.² In the early 1970s Jako Strong, Vaughan described coupling of CO₂ laser to surgical microscope and this provided greater precision and facility for endolaryngeal surgery.³ Dysphonia is the main symptom of lesions that affect the vocal tract. More than 50% of individuals with voice disorders have benign alterations of the vocal fold mucosa. The study is important for the laryngologist not only for the symptoms they produce but also because of the necessity of distinguishing them from malignant lesions. Microlaryngoscopy, Microlaryngostroboscopy, Microdebrider assisted Microlaryngoscopy, Laser Assisted Microlaryngoscopy has changed the whole perspective of laryngeal surgeries. Doloï et al (2011) in a study observed that early diagnosis by microlaryngoscopy leads to identification of malignancy in early stages and better prognosis. Standard treatment of choice should be microlaryngeal surgery with or without laser, voice rest and speech rehabilitation.⁴

Hogikyan⁵ described that the devices are put past soft and delicate tissue in a person's throat, so it's not surprising that temporary hoarseness would occur. Mendels et al found vocal cord injuries varied from none out of six patients to seven out of 10 in studies involving endotracheal tubes, which are passed through the

mouth and into the windpipe. Some people with hoarseness and injuries recovered quickly.⁶

Hoarseness was found in four out of 10 patients immediately after the operation and three out of ten within the first week. There were also some complications after using laryngeal masks, which sit on top of the voice box instead of passing through it.⁶ In one study, one patient out of 21 had a vocal cord injury after their operation, and one in 28 patients was hoarse.⁵

David et al (2008) in a study observed that optical coherence tomography is able to produce high-resolution images of vocal fold mucosa to a maximum depth of 1.6 mm which may be used in the diagnosis of vocal fold lesions, particularly early squamous cell carcinoma and further help in the OCT-guided microsurgery of larynx.⁷ El-Bitar et al (2002) in a study observed that Microdebrider assisted Microlaryngoscopy can be an optional cytoreductive treatment and will enhance phonatory function in laryngeal diseases like angiomatous and gelatinous polypoidal lesions and papillomatosis of larynx.⁸

Reza Rahbar et al (2006) in a study observed that Microlaryngoscopy can be an optional treatment and will enhance phonatory function in patients with laryngeal cleft and early diagnosis and proper repair of the condition are essential to prevent pulmonary damage and associated morbidity.⁹

In one of the study it was seen that microlaryngoscopy revealed abnormal adduction of the vocal folds during inspiration in a case of stridor with cerebral palsy and subsequent injection of periodic type A botulinum toxin to the vocal folds helped in sparing a tracheostomy.¹⁰

CONCLUSION

In our study microlaryngoscopy proved to be a better guide to the management of laryngeal pathologies and a good tool for further research for the benefit of mankind. Different anaesthetic complications should be borne in mind. Its unique treatment modalities must be implemented to avoid increased morbidity and possible mortality.

REFERENCES

1. Stevenson, R.S. and Guthrie, D: History of Otolaryngology. Baltimore: Williams and Wilkins. 1949
2. Alfio Fertlito. Neoplasms of Larynx 1st edition Churchhill Livingstone 1993; 369-400.
3. Stev. M. Zeitels. Surgical Management of early glottic cancer. Otolaryngologic clinics of North America-1997. Feb; 30: 59-78.

4. Pankaj Kumar Doloi, Swagata Khanna. A study of management of benign lesions of the larynx. *Int. J Phonosurgery and Laryngol* 2011; 1: 61-64.
5. Andrew m. Seaman, Voice, throat problems common after anesthesia” *Health | Thu Mar 22, 2012 5:56pm, Reuter Health*
6. Elodie J. Mendels, Jan W. Brunings, Ankie E. W. Hamaekers, Robert J. Stokroos, Bernd Kremer, Laura W. J. Baijens, Adverse Laryngeal Effects Following Short-term General Anesthesia A Systematic Review *Arch Otolaryngol Head Neck Surg.* 2012;138:257-264.
7. David E. Vokes, Ryan Jackson, Shuguang Guo, Jorge A. Perez, Jianping Su, James M. Ridgway, William B. Armstrong, Zhongping Chen, Brian J. F. Wong. Optical Coherence Tomography-Enhanced Microlaryngoscopy: Preliminary Report of a Noncontact Optical Coherence Tomography System Integrated With a Surgical Microscope. *Ann OtolRhinolLaryngol*, Jul 2008; 117:538-547.
8. El-Bitar MA, Zalzal GH. Powered instrumentation in the treatment of recurrent respiratory papillomatosis: an alternative to the carbon dioxide laser. *Arch Otolaryngol Head Neck Surg.* 2002;128:425-8.
9. Reza Rahbar, Isabelle Rouillon, Gilles Roger, Aaron Lin, Roger C. Nuss, Francoise Denoyelle, Trevor J. McGill, Gerald B. Healy, Erea-Noel Garabedian. The Presentation and Management of Laryngeal Cleft. *Arch Otolaryngol Head Neck Surg.* 2006;132: 1335-1341.
10. Cheng YS, Bhutta MF, Ramsden JD, Lennox P. Periodic botulinum toxin injections for paradoxical vocal fold motion in a child with cerebral palsy: a case study. *Int J Pediatr Otorhinolaryngol.* 2014;78:570-1.