Laryngeal fiberscopic surgery – an alternate approach to microlaryngeal surgery

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Abstract Microlaryngeal surgery (MLS) is difficult in patients with anaesthetic and cervical contraindications. An alternative approach is proposed here using a flexible laryngeal fiberscope and specially designed laryngeal instruments under local anaesthesia. Equipment and technique of the procedure is described. Indications and contraindications are highlighted based on our experience of 117 patients. Laryngeal fiberscopic surgery (LFS) was found to be a safer alternative. But this procedure cannot be used for all laryngeal pathologies.

Keywords Microlaryngeal surgery (MLS) · General anaesthesia (GA) · Local anaesthesia (LA) · American Society of Anaesthesia (ASA) · Laryngeal fiberscopic surgery (LFS) · Laryngeal instruments

Introduction

MLS demands general anaesthesia and resultant sharing of the airway by the surgeon and anaesthetist [1]. The procedure may be technically impossible if the cervical spine cannot be extended (Fig. 1). Apart from minor complications Myocardial infarction and death after MLS has also been reported [2].

In order to overcome these disadvantages our study introduces an alternative. The LFS procedure is similar to video-laryngoscopic system proposed by Omori et al. [3, 4] with local anaesthesia (LA) and custom made instruments. LFS has the advantages of being less invasive and cost effective.

Selection criteria

1. Patients with benign, non-neoplastic circumscribed laryngeal lesions such as polyps, papillomas etc

Fig. 1 Pre-operative osteophyte X-ray (DISH)

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in whom the cervical spine cannot be extended (Fig. 1), in obese individuals with short necks and in Obstructive sleep apnea.

2. Biopsy of laryngeal lesions suspicious of neoplastic, tuberculous or other chronic inflammatory lesions.
3. Patients with cystic laryngeal lesions or highly vascular lesions such as rhinosporidiosis, hamartomas and non-pedunculated laryngeal polyps with wide base were excluded from the study.

Materials and methods

An Olympus 3 mm (Model A 3056) nasopharyngo fibroscope, attached to Storz Digital Camera System, with a Xenon Aesculap Axel 180 (OP 930) light source was used and the procedures were recorded.

The forceps are designed to pass behind the tongue base and epiglottis (Figs. 2 and 3). They have cutting edges and a cage area to hold tissues. An eye-let in the upper jaw gives visual control till the lesion is grasped. In addition a scis-

Fig. 2 Specially designed endolaryngeal instruments

Fig. 3 Close-up view of instrument's operating tips

sors and a strongly curved anterior commissure forceps to overcome large tongue base and anteriorly placed larynx are (Fig. 2) also used.

Pre-operative stroboscopy examination was performed with Storz 70° Berci-Ward laryngoscope with voice recording using an Atmos system. With this the feasibility of the surgery and cooperation of the patient is also assessed.

For pre-medication – Promethazine 25 mg intramuscular and Glycopyrolate 0.2 mg intravenous are given 45 minutes before the procedure. Nasal decongestion with 0.05% Xylometazoline drops and bilateral internal laryngeal block with 2% Lignocaine are given 5 minutes before the procedure. A topical 10% Lignocaine spray is administered to the laryngo-pharynx just prior to the procedure.

Patient is comfortably seated on a chair or table and the naso-pharyngoscope is passed through the nose and positioned to get an optimal image of the glottis on the monitor. This is done either by the examiner himself or an assistant. The patient opens his mouth and holds the tongue forward with his hand. The forceps is passed intraorally and the lesions are removed. Wide-based lesions, especially haematogenous polyps will need a two-handed approach with forceps and scissors to cut the base without injuring (Fig. 2) the vocal cord.

Following this minimal or no bleeding is encountered. If there is blood the patient is made to lie with head-end tilted down for a few minutes so that the blood comes into the pharynx and not into the trachea. Medications to the site can also be applied via cotton balls held by the forceps. This was especially used to apply mitomycin following contact granuloma removal.

This study was conducted at our hospital from Jan 2002 to Feb 2008. LFS was performed for 124 patients ranging from 30–73 years of age (Table 1). Evaluation and video documentation of these cases were also done post-operatively. Post-operative stroboscopy was done in 93 patients who had membranous vocal cord lesions.

Results

LFS was accomplished in 117 of 124 cases (94.3%). In seven cases the operation could not be performed due to excessive gag and patient non-compliance. No major post-

Table 1 LFS procedures from Jan 2002 to Feb 2007

Sl. no.	Indications	No. of patients (n = 117*)
I	Vocal cord polyp	66
II	Recurrent adult respiratory papilloma	9
III	Laryngopharyngeal growth for biopsy	36
IV	Recurrent contact granuloma	6

*In 7 out of 124 cases, LFS was not possible

LFS – laryngeal fiberoptic surgery

Fig. 4 Laryngeal fiberscopic surgery

operative complications occurred. In few cases the transient post-operative bleeding resolved spontaneously. Post-operative recurrence, scarring or persistent hoarseness were not noticed in patients with vocal cord polyp ($n = 66$).

Discussion

The proposed procedure is done with a fiberoptic nasopharyngoscope and curved laryngeal instruments passed transorally. The method is similar to the technique proposed by Omori et al. [4]. Duration of the surgery is about 5 minutes and the patient leaves the hospital within 4 hours. The unique advantage of this technique is its magnified view of the laryngopharynx. A two-handed technique can also be performed where the assistant parks the flexible-scope at a suitable site and the surgeon uses both hands for operating.

Previous authors have used Nagashima forceps for a similar surgery [5, 6]. We have designed a set of four forceps and laryngeal scissors to cater to different locations of the lesion. Our study has made provision for lesions at different levels of the glottis and supraglottis. The strongly curved forceps is used to overcome large tongue base and

anteriorly placed larynx which is otherwise not accessible by regular instruments.

LFS is a day-care surgery. With this method, chances of tissue injury and edematous changes are not seen. Thus biopsies in laryngopharyngeal malignancies can be taken without a preliminary tracheostomy. The disadvantages in LFS is, even with two-handed technique the precision work seen with MLS may not be achieved. Hence this technique is not recommended for excision of intracordal cysts, Reinke's edema, hamartomas and in situations where MLS and lateral flap-door techniques are more suitable.

Conclusion

LFS is indicated in cases where MLS or GA is contraindicated. It can also be used to treat vocal cord polyps and recurrent papillomas. Pre-medication, bilateral internal laryngeal nerve block and lignocaine topical spray allows surgery in majority of the patients. Post-operative healing of the vocal fold mucosa and resultant voice was found to be acceptable.

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