

Endoscopic partial epiglottectomy using diathermy for chronic epiglottitis from khat chewing

Ali O. Muthanna, Arif Fadhl Eryani

Otolaryngology Department, Faculty of Medicine and Health Sciences, Sana'a University, Yemen

Corresponding to Ali Obaid Muthanna, MD, Otolaryngology Department, Faculty of Medicine and Health Sciences, Sana'a University, P.O. BOX 20418, Sana'a, Yemen. Mob: 00967711671077; e-mail: muthannadr@yahoo.com

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Objective

The aim of this study was to determine the effect of endoscopic partial epiglottectomy on airway obstruction.

Patients and methods

A prospective study was conducted in the ENT Department, Al-Thawra Teaching Hospital, Sana'a, Yemen. A total of 58 patients underwent partial epiglottectomy using standard laryngeal instruments and monopolar microdissection scissors and hook diathermy, during the period January 2005–July 2011.

Results

A total of 58 patients were included in this study, 47 male and 11 female. Their ages ranged from 21–60 years, with a mean age of 32.39 years. A total of 58 (100%) patients presented with change of voice, 58 (100%) patients presented with difficulty in breathing on exertion, 20 (34.5%) patients presented with foreign body sensation, 58 (100%) with stridor on exertion, 20 (34.5%) with stridor at rest, 20 (34.5%) with dysphagia, and four cases with tracheostomy *in situ*.

Postsurgical results

All (100%) patients showed improvement in voice, breathing, and disappearance of stridor. An overall 90% (18/20) of patients had disappearance of foreign body sensation. Recurrence occurred in 25.9% of patients. Postoperative aspiration occurred in 11 (19%) patients for short time.

Conclusion

Using diathermy to perform endoscopic partial epiglottectomy is simple, effective, and safe in the treatment of hypertrophic epiglottitis using laryngeal instruments and diathermy. It did not need special preparation and could be performed in hospitals that have no laser facilities.

Keywords:

endoscopic epiglottectomy, endoscopy, epiglottectomy, partial epiglottectomy

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Introduction

The epiglottitis participates in protection of the airway, which covers the laryngeal entrance during swallowing [1,2]. Partial or complete removal has been found to have little or no ill effect on normal functioning of the upper aerodigestive tract because of the presence of other protective mechanisms [1,3]. Respiration, deglutition, and phonation can take place almost normally even if the epiglottitis is removed [2].

Indications for removal of the epiglottis include benign or malignant lesions, or airway obstruction [1]. Another uncommon indication in adults is the large flaccid or floppy epiglottis causing snoring, obstructive sleep apnea syndrome, inspiratory stridor, and difficulty in breathing [4,5].

Epiglottectomy is usually performed using either conventional laryngeal instruments or laser [1,3,6]. The aim of this study was to determine the effect of partial epiglottectomy on the supraglottic obstruction in cases of chronic hypertrophic nonspecific epiglottitis.

Patients and methods

A prospective study was carried out involving patients who presented with difficulty in breathing, stridor, foreign body sensation, and hypertrophic epiglottitis. Patients were diagnosed in the Otorhinolaryngology Department, Al-Thawra Teaching Hospital, Sana'a, Yemen, during the period from January 2005 to July 2011. The study was performed after obtaining written informed consent from patients and ethical approval from the Ethics Committee of Al-Thawra Hospital.

All patients underwent preoperative evaluation, which included history taking, clinical examination, indirect laryngoscopy, fiberoptic laryngoscopy under local anesthesia, hematology, liver function tests, renal function tests, chest and neck radiographs, computed

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tomography scan of the neck, and histopathological study. Follow-up was for 1 year. Children and patients with laryngeal trauma, tumors and granulomas, diabetes mellitus, acute inflammations, and uncontrolled hypertension were excluded from study.

Operative technique

General anesthesia with muscle relaxant was used, and cuffed endotracheal intubation was performed. A wide-lumen rigid laryngoscope was inserted with the tip in the vallecular space, allowing the epiglottis to fall in the view. Laryngoscope holder resting on a special table was attached to the laryngoscope. Standard laryngeal instruments and curved rotating monopolar microdissection scissors and monopolar diathermy hook (made by Karl-Storz; Karl Storz Se & Co. KG, Tuttlingen, Germany, and used in laparoscopic surgery) were used. An operative microscope with 400 lens was used in some cases.

Excision of the epiglottis was initiated on the right side. The epiglottis was retracted using the laryngeal grasping forceps. The right glossoepiglottic fold was first coagulated and then divided to control blood supply to the operative site. The epiglottis was then divided just above the floor of the vallecula by first applying coagulation and then cutting until around half way. The diathermy scissors were then rotated to cut the left half of the epiglottis in the same way. Approximately, the upper two-thirds of the epiglottis were removed.

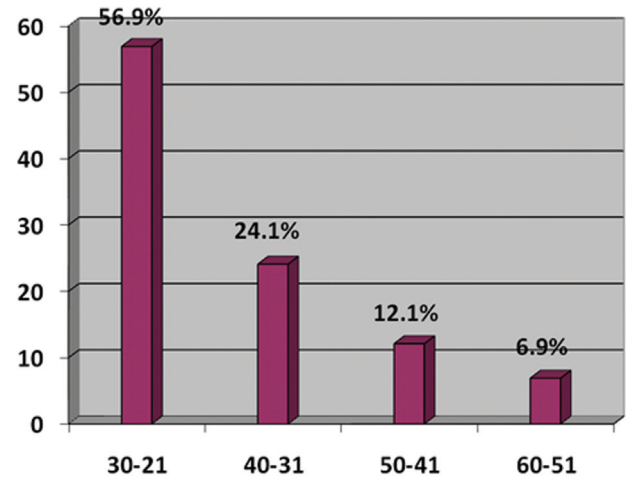
Data were analyzed using the χ^2 -test of significance, and significance was considered when *P*-value was less than 0.05.

Results

A total of 58 patients were enrolled in this study, 47 (81.1%) male and 11 (18.9%) female, with an age range of 21–60 years and a mean age of 32.39 years (Fig. 1). All patients had been khat chewers (leaf of this plant is collected in the oral vestibule and oral cavity for 2–4 h/day). The most commonly presented symptoms were as follows in the order of frequency: change in voice (muffling), difficulty in breathing, stridor, and foreign body sensation (Fig. 2).

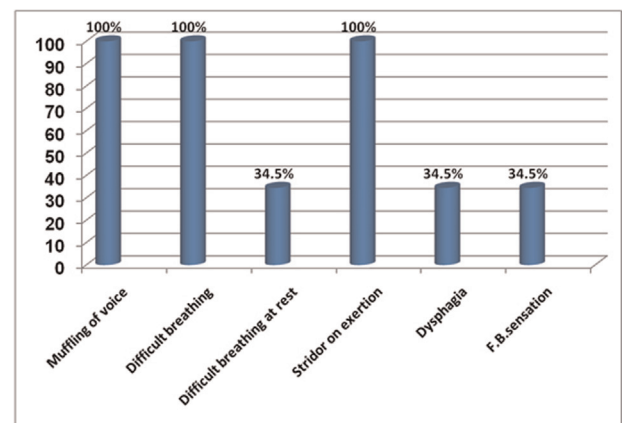
Signs of chronic epiglottitis include paleness in color, irregular surface, intact mucosa, and overhanging of the epiglottis on the laryngeal inlet (Fig. 3). Because of the thickness of the epiglottis, as well as the shortness and the thickening of the aryepiglottic folds, both vocal cords had been hidden by collapsed epiglottis (Fig. 4).

Figure 1



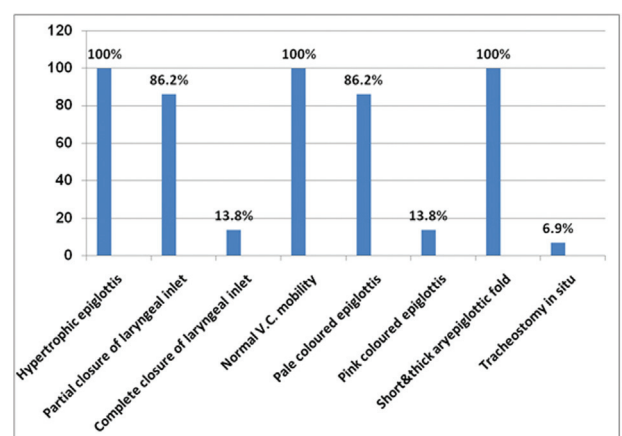
Age categories.

Figure 2



Presenting symptoms. FB, foreign body.

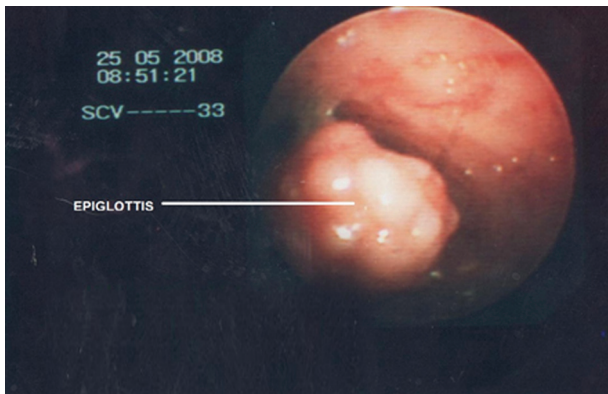
Figure 3



Presenting signs. VC, vocal cord.

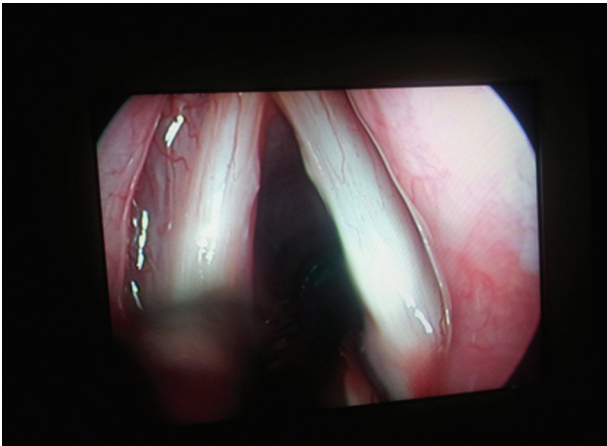
However, vocal cords retained their normal mobility and shape (Fig. 5).

Figure 4



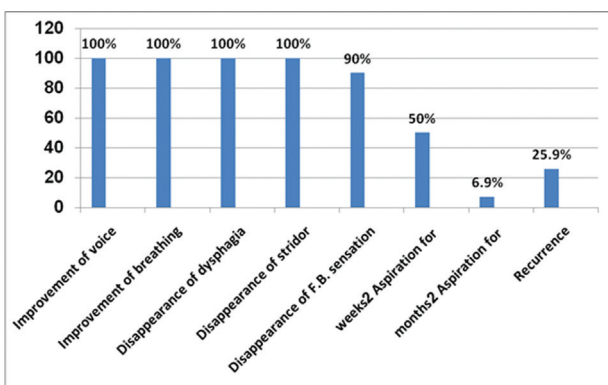
Preoperative hypertrophic epiglottis.

Figure 5



Postoperative glottic region.

Figure 6



Postoperative results. FB, foreign body.

Postoperative results

The results revealed improvement of voice in all 58 (100%) cases, improvement of breathing in all 58 (100%) cases, and disappearance of foreign body sensation in 18/20 (90%) cases. Postoperative complications were postoperative bleeding after

extubation in only one case and fluid aspiration for short period in four (6.9%) cases; in two cases, one male and one female, aspiration persisted for 2 months and pain for 10 days. Recurrence occurred in 15 (25.9%) cases between 6 months and 1 year (Fig. 6). All of them resumed khat chewing.

Postoperative analgesic and broad spectrum antibiotic were used for 10 days. Postoperative corticosteroids were used in cases with no contraindications for 10 days in taping schedule (0.5 mg/kg). Feeding started after 24 h postoperatively and all patients were discharged from the hospital on the second day postoperatively. Histopathology reports proved that all cases had chronic nonspecific inflammation (Fig. 5).

Discussion

Epiglottectomy is usually performed with the carbon dioxide laser facilities, which are relatively expensive and not always available, especially in the Yemeni context. Laser epiglottectomy may require the use of a metal tube, which increases the risk for laryngeal damage [7].

To avoid the risk of fire, Zeitels *et al.* used a foil protected rubber tube interposition of a wet swab between the tube and epiglottis that adds bulk that restricts the operative field. These are not necessary in diathermy epiglottectomy [1].

A floppy epiglottis is most commonly associated with a previous history of neurological diseases. One study reported eight cases of epiglottic prolapse. Six of them had severe central nervous system diseases and there was difficulty with decannulation following tracheostomy during recovery from coma, due to epiglottic prolapse. Three of six had partial epiglottectomy using carbon dioxide laser with good results. A floppy epiglottis may also occur months or even years after resection of the floor of the mouth, laryngeal fracture, after radical neck dissection, and radiotherapy [3,4].

The role of epiglottis in protection of the airway is minimal; however, it has serious effects on airway obstruction in case of hypertrophy, as it may lead to airway obstruction, dyspnea, stridor, and choking attacks. We found that the prevalence of this disease was higher in men than in women due to khat chewing, as it is more prevalent among men. This is in line with the findings of similar previous studies [8]. It should be noted that hypertrophic epiglottis occurs less in the age group 51–60 years (6.9%). This might be due to the

high prevalence of khat chewing among middle-aged individuals compared with the older age group. In our study, all cases had hypertrophic epiglottitis, as well as shortness and thickness of aryepiglottic folds, which is due to chronic nonspecific inflammation that led to narrowing or closing of the laryngeal inlet.

All patients in this study presented with difficulty in breathing due to obstruction of the laryngeal inlet by hypertrophic epiglottitis. Stridor on exertion was found in 100% of patients and in 34.5% of patients at rest; the degree of stridor was related to the degree of the laryngeal inlet closure.

Wilkie *et al.* [9] reported marked mucosal swelling of the epiglottis that had collapsed into the glottis area and caused difficulty breathing. Resection of edematous epiglottis was performed using microlaryngoscopy to relieve supraglottic obstruction. Epiglottis prolapse during inspiration treated with partial or total epiglottectomy has been reported during the treatment of airway obstruction caused by a floppy epiglottis [10]. In our study, we performed endoscopic partial epiglottectomy to relieve supraglottic obstruction. The results were satisfactory with a success rate of 74.1%, and recurrence airway symptoms occurred during the first 6 months to 1 year in 25.9% of patients. All of these patients returned back to chewing khat and underwent a second surgical intervention, whereas two patients underwent a third surgical intervention. However, patients who did not resume khat chewing did not suffer such symptoms.

Stevens *et al.* [11] studied eight cases of supraglottic stenosis secondary to radiation therapy or autoimmune disorder and associated with dysphagia. These cases were treated with carbon dioxide laser. Most of the cases required more than one surgical intervention because of recurrence of airway symptoms. The securing of airway is the most important step in the management of airway obstruction [12]. Supraglottitis is the inflammation of the epiglottis and surrounding structures [13] and is the leading cause of potential life-threatening airway compromise [14]. Krishna and Malon [15] reported one case with near-total airway obstruction and diagnosis of an epiglottis mass. Biopsy revealed isolated supraglottic stenosis due to fibrosis with acute and chronic inflammation. Transoral supraglottic laryngectomy was required for definitive treatment.

The results of previous studies are similar to those reported in our study, and supraglottic stenosis must be treated with surgical intervention and may require

more than one surgical intervention. In our study, 6.9% of the cases presented with tracheostomy in place due to supraglottic obstruction. Tracheostomy tube was removed on the second postoperative day and the opening of the tracheostomy was closed with a gauze without airway compromise.

Khat chewers often complain of symptoms of mucosal inflammation and thickness in the pharynx and esophagus. These effects were believed to be caused mainly by the strong astringent tannins in khat [16]. These areas are exposed to khat juice during khat chewing, leading to these pathological changes and symptoms.

Conclusion

Endoscopic partial epiglottectomy is usually performed using a surgical laser. Epiglottectomy may be indicated for the treatment of benign or malignant lesions and for the relief of airway obstruction caused by a floppy epiglottis. In our study, we performed endoscopic partial epiglottectomy in patients presenting with hypertrophic epiglottitis caused by chronic nonspecific inflammation of the supraglottic area that leads to airway obstruction. We used microdissection monopolar scissors and diathermy hook, in addition to standard laryngeal instruments. This was found to be safe, effective, and of low cost with minimal morbidity, and could be performed in hospitals that have no laser facilities.

Recommendations

It is recommended to increase public awareness of the potential health hazards of khat chewing to prevent chronic nonspecific inflammation of the supraglottic area. It is also crucial to support scientific research on khat and explore its different effects on public health. It is also recommended to follow-up postoperative cases for longer time.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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