Vol.20, No.2, Page 505- 509, 2026 http://dx.doi.org/10.59628/jchm.v20i2.2589 ISSN 2958-7476 JMCH

Sana'a University Journal of Medical and Health Sciences

Endoscopic partial epiglottectomy (EPE) by coblation in chronic hypertrophic adult epiglottitis with airway obstruction.

Salwa J. AL- Hammadi[1] * and Mohammed S. Musleh[2]

[1]**Department of ORL, Faculty of Medicine, 21 September University for Medical and Applied Sciences, Sana'a, Yemen.,**
[2]**Department of ORL, Faculty of Medicine and Health Sciences, Sana'a University, Sana'a, Yemen.**

*Corresponding author: d.salwajalal@gmail.com.

Abstract

Background: Adult chronic epiglottic hypertrophy with a folded epiglottis obstructing the laryngeal inlet and airway is frequently encountered in our specialty. Partial epiglottectomy to resolve obstruction is performed using diathermy, laser, and transoral robotic surgery. Coblation is a plasma-mediated ablation technique that has recently been used in laryngeal surgery.
Objectives: This study aimed to evaluate the effectiveness and outcomes of endoscopic partial epiglottectomy (EPE) using coblation.
Methodology: A retrospective study was conducted on nine patients who underwent EPE using coblation.
Results: All patients were men between the second and fifth decades of life, who presented with stridor, muffled voice, and odynophagia. These symptoms improved postoperatively, with mild transient aspiration encountered in three cases and minimal granulation tissue observed in four cases. Supraglottic stenosis was noted in three cases, with no respiratory obstruction.
Conclusion: Endoscopic partial epiglottectomy by coblation is safe, effective, and a better alternative than diathermy and laser, with less operative time, control of bleeding, less tissue damage, and no need for precautions.

Article Info

Keywords:
Coblation, epiglottectomy, folded epiglottis, stridor.

Article History:
Received: 02-December-2025,
Revised: 15-December-2025,
Accepted: 03-March-2026,
Published: 28 April 2026.

Introduction

Adult epiglottitis can be caused by many factors, both infectious and non-infectious. Chronic epiglottitis is more related to non-infectious causes, including autoimmune diseases and organophosphorus ingestion [1, 2].

Khat leaves chewing for several hours daily gives a euphoria-like sensation due to the cathinone substance, which resembles amphetamine in its action. Therefore, chewing khat is widespread among large parts of our community and in some African countries, and this may play a role in chronic pharyngolaryngitis [3, 4].

Patients with chronic pharyngolaryngitis usually present with a muffled voice, dyspnea, and stridor in severe cases due to epiglottic hypertrophy and posterior collapse of the laryngeal inlet [[2, 3] and [5].

Primary epiglottic collapse is classified based on the axis of collapse, which can be a floppy epiglottis (complete anteroposterior collapse), book type (lateral folding), or folding type (when the entire epiglottis falls from all directions) [6–8].

Partial epiglottectomy can be performed using laser, diathermy, and transoral robotic surgery to improve the symptoms of epiglottic collapse [8–10]. In the past, we performed partial epiglottectomy by diathermy because of the unavailability of lasers in our country; however, we noticed that bleeding control and time of operation

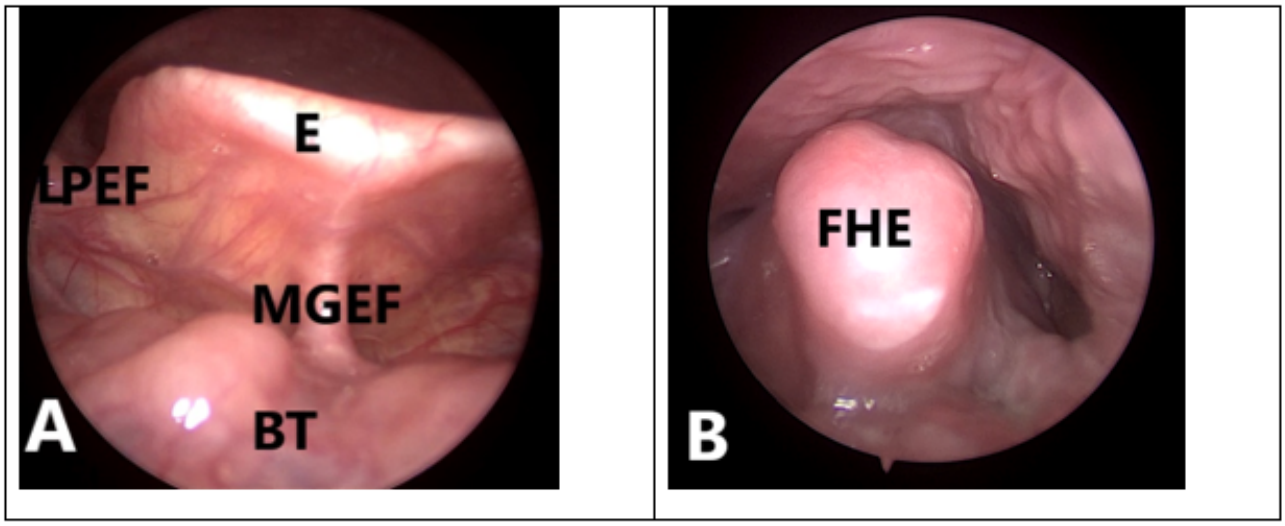

Figure 1. Laryngoscopy at ENT clinic under local anesthesia: A. Normal epiglottis. B. Folded hypertrophic epiglottis.

were prolonged. Therefore, we started to use coblation in partial epiglottectomy to overcome these difficulties. According to our research, we did not find any previous studies on endoscopic partial epiglottectomy (EPE) by coblation.

This study aimed to evaluate the effectiveness and outcomes of EPE using coblation for airway obstruction caused by a hypertrophic epiglottis.

Patients and methodology:
This retrospective study was approved by our institution's ethics committee and was conducted on nine patients who presented at the otorhinolaryngology clinic at Azal Hospital, Sana'a, Yemen, between July 2021 and August 2024.

All patients presented with muffled voice, odynophagia, and stridor. A full history was taken, and all of them were khat chewers. Laryngoscopy was performed on all patients at the clinic, which revealed a hypertrophic, folded, and collapsed epiglottis obstructing the laryngeal inlet with an inability to see the vocal folds (Figure 1B). They underwent neck CT to assess other laryngeal subsites, routine blood investigations, chest X-ray, ECG,and ECHO in some cases. Tracheostomy consent was obtained from all patients.

The inclusion criteria were patients with stridor, hypertrophic and folded epiglottis without redness and ulceration of the laryngeal and pharyngeal mucosa.

Exclusion criteria were patients who presented with ulcerated pharyngolaryngitis.

The anesthesiologist induced anesthesia through tracheostomy or endotracheal tube, and direct laryngoscopy with a large Karl Storz video laryngoscope and a Hopkins straight forward telescope 15 °were used to visualize the larynx and allow the epiglottis to fill inside the laryngoscope. The laryngoscope was fixed to the chest piece on the table. Large microlaryngeal forceps were used to grasp the epiglottis to expose the right lateral edge of the epiglottis (figure 2A). Endoscopic partial epiglottectomy by coblation started from the lateral to the midline of the epiglottis, avoiding the lateral pharyngoepiglottic fold to prevent bleeding (Figure 2B).

When the epiglottic cartilage was exposed, a large laryngeal microscissor was used to cut the cartilage. Ablation and coagulation were continued until reaching the midline. The part of the epiglottis that was removed was bounded anteriorly by the median glossoepiglottic fold at the lingual surface of the epiglottis and the lateral pharyngoepiglottic fold laterally (Figure 2B). The laryngoscope was repositioned to visualize the left side of the epiglottis and removed using the same technique (supporting video).

Oluwasanmi and Mal illustrated this technique in 2001 with monopolar diathermy [9].

Patients were transferred to the ICU for observation for six hours then transferred to the surgical ward for 48–72 h. Postoperatively, oral intake was initiated 4 h after recovery from anesthesia with a soft cold diet, and a normal diet was resumed after 48 h. Patients were discharged on antibiotics, proton pump inhibitors, and systemic steroids with tapering doses. Follow-up after one week, two weeks,and one month was done with laryngoscopy in the outpatient department to visualize the larynx, according to need (Figure 3 A and B).

Once the laryngeal edema had improved, training to

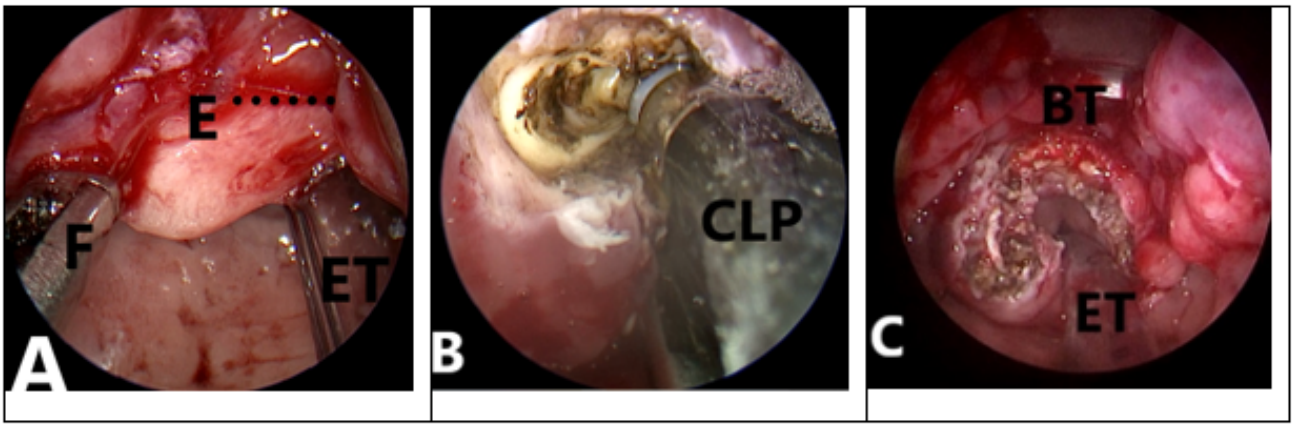

Figure 2. Direct laryngoscopy and endoscopic partial epiglottectomy by coblation under general anesthesia: A. Grasping of epiglottis by microlaryngeal forceps to expose its right lateral edge. B. Ablation and coagulation of epiglottis from lateral to midline. C. Final endoscopic intraoperative view.

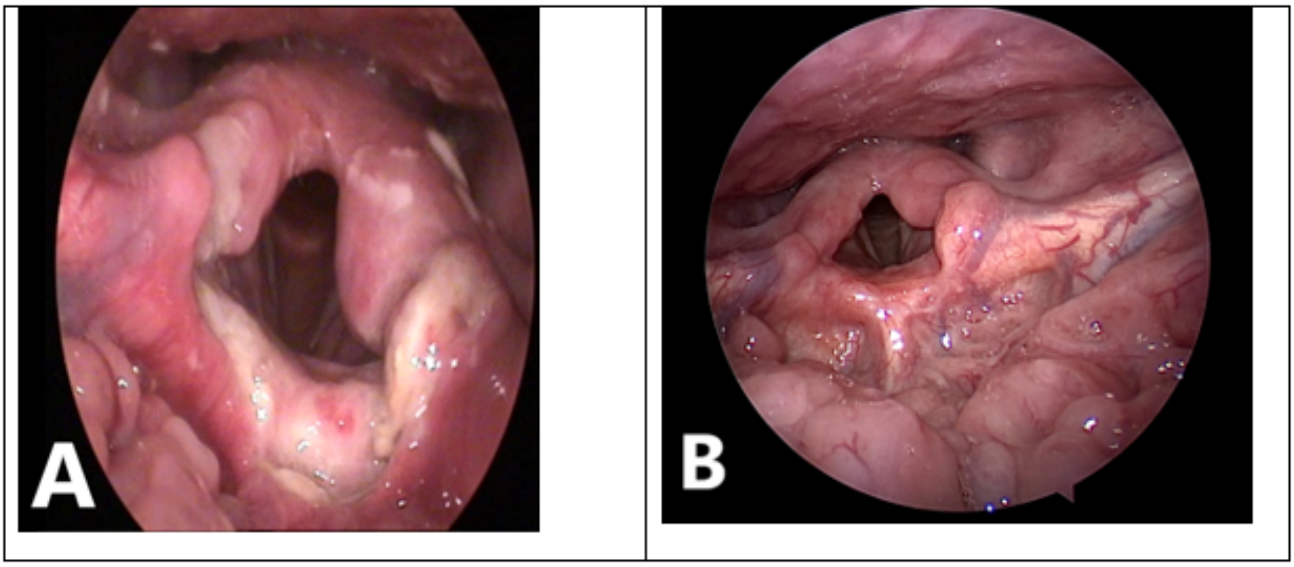

Figure 3. Post-operative view by laryngoscope at ENT clinic under LA. A: after one week. B: after one month.

close the tracheostomy was done.

Results:

All nine patients underwent EPE via coblation due to stridor and upper airway obstruction. They were males between 20 and 55 years of age, with a mean age of 37.5.

Endotracheal intubation was difficult in all patients; therefore, six of them underwent tracheostomy under local anesthesia, while the other three patients were intubated with difficulty; therefore, tracheostomy was performed at the end of the operation because of the expectation of difficult extubation (Table 1).

Four patients had their tracheostomy tubes removed after one week of the operation, while five patients were kept on tracheostomy for one month and then removed (Table 1).

Regarding complications (Table2), bleeding was minimal in seven cases and was easily controlled by coblation, whereas in two cases, bleeding took time to be controlled. No postoperative bleeding was observed.

Postoperative supraglottic edema was observed by laryngoscopy in all cases, which improved with steroids within one week postoperatively (Figure 3A).

Marked improvement in voice, stridor, laryngeal inlet opening, and a significant decrease in laryngeal edema were observed after one month in all cases (Figure 3B).

Two patients had remnants at the lateral parts of the epiglottis, and completion surgery was performed one month after the initial operation. Supraglottic stenosis was observed in three patients without significant airway obstruction.

Table[1]: Airway management with postoperative weaning:

Airway management	Number	Percentage
Endotracheal intubation preoperatively	3	33.3%
Tracheostomy preoperatively	6	66.7 %
Tracheostomy at the end of operation	3	33.3%
Tracheostomy weaning:		
Within one week	4	44.4%
Within one month	5	55.5%

Table[2]: Postoperative results and complications:

Results and complications	Number	percentage
Stridor improvement	9	100%
voice improvement	9	100%
Remnants of the lateral parts of epiglottis	2	22.2%
Intraoperative bleeding	2	22.2%
Post-operative bleeding	0	0%
Supraglottic edema	9	100%
Supraglottic stenosis	3	33.3%
Aspiration	3	33.3%
Granulation tissue	4	44.4%

Mild aspiration was observed postoperatively in three patients, which improved after one month. Minimal granulation tissue postoperatively was found during follow-up in four cases (Table 2).

Discussion:

Adult chronic epiglottic hypertrophy is frequently encountered among khat chewers in our community, leading to a muffled voice and airway obstruction. In addition, it represents a dilemma in our field since patients were treated for long durations as asthmatic patients for dyspnea and presented lastly to us with stridor.

Pesticides, which contain organophosphorus substances that are used during khat planting, may play a role in adult chronic noninfectious epiglottitis, especially in our community [[1, 3, 4] and [11]].

Khat chewing is common among adult males over 18 years of age. For this reason, we did not face any similar cases in children, which agrees with the study by Muthana et al.. al [3].

However, we encountered cases of chronic hypertrophic epiglottitis among khat-chewing females, but none of them underwent EPE at our institution.

The most common presentations among our patients were muffled voice, odynophagia, and respiratory obstruction, which were similar to the findings of others [[3, 5] and [12]]. In our study, difficulty in intubation was encountered in six patients due to the posterior positioning of the epiglottis and its stiffening; therefore, tracheostomy was performed under local anesthesia, which is consistent with other studies [2, 5].

Many authors have described the surgical technique of partial epiglottectomy using different techniques. Endoscopic CO2 laser partial epiglottectomy was described by Catalfumo et al. in 1998 with the removal of the U-shaped part of the epiglottis and keeping the lateral part of it to avoid bleeding [13]. Zeitels et al. started the operation by coagulating the lateral pharyngoepiglottic fold for the same reason [14]. In 2001, Oluwasanmi and Mal illustrated a partial epiglottectomy using monopolar diathermy and found it to be a better alternative than laser, as laser requires special precautions and is not available in all medical facilities [9].

Coblation is a plasma - mediated ablation works by bipolar current that passing through normal saline media breaking it down to sodium radicals that break tissue bonds and melt tissue at low temperature (60-70c). The collateral tissue damage is less than that of bipolar and monopolar cauterization, and thermal injury reaches about 400-600c [15, 16]. Magdy et al. conducted a prospective study to evaluate histological damage to tissues in patients who underwent tonsillectomy with the coblation technique versus diathermy. They found that the depth of thermal injury is less in patients with coblation in comparison to monopolar diathermy (0.13-0.63 mm respectively) [17]. That is why we consider coblation effective, safe and less tissue damage than diathermy, in addition to its advantages, which includes cutting, coagulation, irrigation, and suctioning with the same probe at the same time these considered time preserving. In our practice, we noted that the operative time was about 90 to 120 minutes in partial epiglottectomy by monopolar diathermy, in comparison to coblation, when the operative time was about 60 to 90 minutes. Calculation of the time was done roughly from the start of anesthesia to the extubation. For these reasons, we used coblation for EPE.

Regarding the volume of the epiglottis that was removed, we had two cases with remnants of the epiglottis bilaterally because of the preservation of the lateral part of the epiglottis to avoid bleeding from the unnamed branch of the superior laryngeal artery described by Zeitels et al. [14]. However, we observed that these parts still partially obstructed the laryngeal inlet in two cases, and patients still complained of respiratory obstruction; therefore, we performed a second operation to remove them. In contrast, another study done by Jeong et al. removed the triangular part of the epiglottis in two cases and reported improvement in epiglottis collapse [18]. Bae et al. concluded that it is difficult to determine the volume of the epiglottis to cut without causing postoperative sequelae [8].

Oluwasanmi and Mal [2001 faced post-operatively vomiting of blood in one case and another case of post-operative aspiration [9]. Aspiration was insignificant among our patients and was a temporary symptom that improved after one month, which is in concordance with another study [3].

Conclusion:

Endoscopic partial epiglottectomy for chronic adult hypertrophic and folded epiglottis is a life-saving procedure for patients with stridor. Coblation is safe, effective, does not require special precautions, and is more affordable than laser treatment; therefore, it is considered a better alternative to laser treatment in developing countries where lasers are not available. Coblation has advantages over diathermy in controlling bleeding, shorter operative time, and less collateral tissue damage and edema.

REFERENCES

[1] H. C. Alpay, E. Keles, I. Orhan, and S. Yalcin, "Chemical injury of larynx after organophosphate ingestion," *Otolaryngol. Head Neck Surg.*, vol. 140, pp. 604–605, 2009.

[2] I. Orhan, S. Aydin, and T. Karlidag, "Infectious and noninfectious causes of epiglottitis in adults," *Turkish Arch. Otorhinolaryngol.*, vol. 53, no. 1, pp. 10–14, 2015.

[3] A. O. Muthanna and A. F. Eryani, "Endoscopic partial epiglottectomy using diathermy for chronic epiglottitis from khat chewing," *The Egypt. J. Otolaryngol.*, vol. 34, pp. 55–59, 2018.

[4] A. Al-Motarreb, M. Al-Habori, and K. J. Broadley, "Khat chewing and cardiovascular diseases," *J. Ethnopharmacol.*, vol. 132, pp. 540–548, 2010.

[5] M. Al-Qudah, S. Shetty, M. Alomari, and M. Alqdah, "Acute adult supraglottitis: Current management," *South. Med. J.*, vol. 103, pp. 800–804, 2010.

[6] P. E. Vonk, M. J. L. Ravesloot, K. M. Kasius, J. P. van Maanen, and N. de Vries, "Floppy epiglottis during drug-induced sleep endoscopy," *Sleep Breath.*, vol. 24, no. 1, pp. 103–109, 2020.

[7] C. Torre, M. Camacho, S. Y.-C. Liu, L.-K. Huon, and R. Capasso, "Epiglottis collapse in adult obstructive sleep apnea: A systematic review," *The Laryngoscope*, vol. 126, no. 2, pp. 515–523, 2016.

[8] M. R. Bae and Y. S. Chung, "Epiglottic collapse in obstructive sleep apnea," *Sleep Med. Res.*, vol. 12, no. 1, pp. 15–19, 2021.

[9] A. F. Oluwasanmi and R. K. Mal, "Diathermy epiglottectomy: Endoscopic technique," *J. Laryngol. Otol.*, vol. 115, no. 4, pp. 289–292, 2001.

[10] A. Arora, K. Chaidas, G. Garas, et al., "Outcome of tors to tongue base and epiglottis in osa," *Sleep Breath.*, vol. 20, no. 2, pp. 739–747, 2015.

[11] S. El-Zaemey, J. Schuz, and M. E. Leon, "Qat chewing and risk of oral disorders," *Int. J. Occup. Environ. Med.*, vol. 6, pp. 129–143, 2015.

[12] L.-A. Guldfred, D. Lyhne, and B. C. Becker, "Acute epiglottitis: Epidemiology and management," *The J. Laryngol. & Otol.*, vol. 122, pp. 818–823, 2008.

[13] F. J. Catalfumo, A. Golz, S. T. Westerman, et al., "Epiglottis and obstructive sleep apnoea," *The J. Laryngol. & Otol.*, vol. 112, pp. 940–943, 1998.

[14] S. M. Zeitels, C. W. Vaughan, G. F. Domanowski, et al., "Laser epiglottectomy: Technique and indications," *Otolaryngol. Head Neck Surg.*, vol. 103, pp. 337–343, 1990.

[15] R. L. Plant, "Radiofrequency treatment of tonsillar hypertrophy," *The Laryngoscope*, vol. 112, pp. 20–22, 2002.

[16] V. M. Duarte, Y. F. Liu, and N. L. Shapiro, "Coblation tonsillectomy vs intracapsular tonsillectomy," *The Laryngoscope*, vol. 124, no. 8, pp. 1959–1964, 2014.

[17] E. A. Magdy, A. S. El-Daly, M. Abdel-Hadi, and M. A. Morshedy, "Coblation tonsillectomy comparison study," *The J. Laryngol. & Otol.*, vol. 122, pp. 282–290, 2008.

[18] S. H. Jeong, C. M. Sung, S. C. Lim, and H. C. Yang, "Partial epiglottectomy improves apnea-hypopnea index," *J. Clin. Sleep Med.*, vol. 16, no. 9, pp. 1607–1610, 2020.