Comparison between bilateral partial Inferior Turbinectomy under general anesthesia and bilateral inferior Turbinate Reduction by Coblation under local anesthesia

Zaki F. Aref[a], Temothaws Atef Mena[a*], Aida A. Abdelmaksoud[a]

[a]Otorhinolaryngology Department, Faculty of Medicine, South Valley University, Qena , Egypt

Abstract

Background: One of the most frequent causes of nasal obstruction is inferior turbinate hypertrophy. It can be treated medically or surgically.

Objectives: to compare between bilateral partial inferior turbinectomy under general anesthesia and bilateral inferior turbinate reduction by coblation under local anesthesia regarding intraoperative and postoperative bleeding, postoperative nasal obstruction, hyposmia, snoring, pain and crusts.

Patients and methods: The study included 40 patients with inferior turbinate hypertrophy, divided into two groups. Group (A) included 20 patients underwent partial inferior turbinectomy under general anesthesia and group (B) included 20 patients underwent turbinate reduction by coblation under local anesthesia.

Results: Nasal obstruction improved significantly in both groups (p-value< 0.001). The improvement was more with group (B) after 1 week (1.8±0.8) than group (A) (2.3±0.9) without significant difference (p-value= 0.114). Nasal obstruction improved equally in both groups after 1 month without significant difference (p-value= 0.925) while improvement was more with group (A) (0.5±0.7) than group (B) (0.7 ± 0.6) after 4 months without significant difference (p-value= 0.398). Hyposmia improved in both groups after 4 months without significant difference between studied groups (p-value= 0.289). Snoring improved in both groups after 4 months without significant difference between studied groups (p-value= 0.086). Intraoperative bleeding, postoperative pain and crusts were more with group (A) with high significant difference (p-value< 0.001). Postoperative bleeding was more with group (A) with significant difference (p-value= 0.01).

Conclusion: Partial inferior turbinectomy and coblation are effective and safe methods for relief of nasal obstruction with less postoperative bleeding, pain and crusts with coblation.

Keywords: Nasal obstruction; Turbinate hypertrophy; Coblation; Partial inferior turbinectomy.

DOI: 10.21608/SVUIJM.2023.196021.1543

***Correspondence**: temoooatef@gmail.com

Received: 2 Febraury,2023.

Revised: 22 March,2023.

Accepted: 14 March,2023.

Published: 11 January, 2025

Cite this article as Zaki F. Aref, Temothaws Atef Mena, Aida A. Abdelmaksoud.(2024). Comparison between bilateral partial Inferior Turbinectomy under general anesthesia and bilateral inferior Turbinate Reduction by Coblation under local anesthesia. *SVU-International Journal of Medical Sciences*. Vol.7, Issue 2, pp: 1116-1126.

Introduction

Bilateral hypertrophied inferior turbinate is a frequent cause of nasal obstruction which can occur as a result of allergic rhinitis, vasomotor rhinitis, chronic hypertrophic rhinitis, or as a compensatory response to a septal deviation **(Cingi et al., 2010)**. It can be treated medically by local and systemic decongestants, intra-nasal steroid sprays and antihistamines **(Abdul Aziz 2012)** or surgically by partial and total turbinectomies, laser ablation, cryotherapy, electrocautery and submucosal turbinoplasty **(Hol et al., 2000)**. Surgical intervention should improve nasal obstruction while protecting the mucosa and reducing the risk of complications from atrophic rhinitis. Turbinate reduction has less destructive techniques like radiofrequency volumetric tissue reduction (RFVTR) (COBLATION) **(Nease et al., 2004; Chang et al., 2004)**. These different techniques have variable degrees of morbidity, success and patient satisfaction **(Puterman et al., 2012)**. They should be judged by the degree of nasal obstruction relief, evaluated both subjectively and objectively and by the occurrence of short-term and long-term side effects **(Talaat et al., 1987).**

Patients and Methods

This study was done on 40 patients with bilateral inferior turbinate hypertrophy admitted to ENT department, South Valley University at the period from March 2022 to January 2023. It was approved by ethical committee of South Valley University on March 2022. They were 22 males and 18 females. They were divided into two groups: group (A); included 20 patients submitted to partial inferior turbinectomy under general anesthesia and group (B); included 20 patients submitted to turbinate reduction by coblation under local anesthesia. The two groups were subjected to full history taking including nasal obstruction, hyposmia, snoring and postoperative pain. Full general and ENT examination including preoperative and postoperative nasal endoscopic examination, routine laboratory investigations and CT scan of the nose and Para nasal sinuses were done. The findings preoperatively and postoperatively were recorded with the aid of the endoscope and after discharge from the hospital for 4 months.

In Bilateral partial inferior turbinectomy under general anesthesia: the patients were in supine position. It was done by clamping the base of the inferior turbinate for hemostasis, followed by cutting the entire turbinate along its base using turbinectomy scissors. After that, nasal packing was done which was removed after 48hrs **(Spector 1982)**.

***In Turbinate reduction by coblation under local anesthesia*:** the patients were in supine position. It was done using a bipolar radiation-producing probe. This probe was applied on the mucosa along the medial surface of the inferior turbinate until shrinkage of the turbinate occurred. Nasal pack was applied in the nasal cavity bilaterally and removed after 2 days.

Intraoperative bleeding was assessed in both groups. Follow-up was done on the 1st week, 3rd week, 1st month, 2nd month and 4th month and patients were asked for relief of nasal obstruction, hyposmia and snoring, presence of postoperative pain and examined for postoperative bleeding, and crusts.

***Subjective findings*:** We used a standard visual analog scale (VAS). It ranges from 0 (patient has no symptoms) to 10 (patient has severe symptoms) to assess preoperative and postoperative nasal obstruction, snoring and hyposmia and

postoperative pain **(Francesco et al., 2009)**.

***Objective findings*:** Nasal examination using rigid endoscope (0 degree, 2.7 mm) was done to observe intraoperative bleeding, postoperative bleeding and crusts.

Statistical analysis

Data were analyzed using Statistical Program for Social Science (SPSS) version 24. Quantitative data were expressed as mean ±SD. Qualitative data were expressed as frequency and percentage. Mann Whitney U test (MW) was used when comparing between two means (for abnormally distributed data). Chi-square test was used when comparing between non-parametric data. Probability (P-value) < 0.05 was considered significant.

Results

A case control study included 40 patients divided into two groups; (A) and (B). Group (A) included 20 patients with the mean of age was 26.7±6.9 while group (B) included 20 patients with the mean of age was 23.6±6.4 with no significant difference (p-value = 0.149). There were 22 males (8 in group A and 14 in group B) and 18 females (12 in group A and 6 in group B) with no significant difference (p-value = 0.057).

Nasal obstruction

It improved significantly in both groups postoperatively (p > 0.001).The mean of preoperative VAS score in group (A) was 8.5±0.5 while the mean of preoperative VAS score in group (B) was 8.4±0.7 with no significant difference. Nasal obstruction improved significantly in both groups but more with group B (1.8±0.8) than group A (2.3±0.9) after 1 week with no significant difference (p-value= 0.114). However, it improved equally in both groups after 1 month with no significant difference (p-value= 0.925). The improvement in nasal obstruction was more in group A (0.5±0.7) than group B (0.7 ± 0.6) after 4 months with no significant difference (p= 0.398) as shown in (**Tables 1,2,3 and Fig.1**).

Table 1. Comparison between both groups as regard nasal obstruction by VAS

Variables		Group A	Group B	P-value
Nasal obstruction (pre-op)	**Mean**	8.5	8.4	0.799 NS
	±SD	0.5	0.7	
Nasal obstruction (1 week)	**Mean**	2.3	1.8	0.114 NS
	±SD	0.9	0.8	
Nasal obstruction (1 month)	**Mean**	1.4	1.4	0.925 NS
	±SD	0.8	0.5	
Nasal obstruction (4 months)	**Mean**	0.5	0.7	0.398 NS
	±SD	0.7	0.6	

Table 2. Comparison of nasal obstruction before and after intervention in group (A)

Group A	Mean	SD	P-value
Pre-operative	8.5	± 0.5	**< 0.001 HS**
1 week post-operative	2.3	± 0.9	
1 month post-operative	1.4	± 0.8	
4 months post-operative	0.5	± 0.7	

Table 3. Comparison of nasal obstruction before and after intervention in group (B)

Group B	Mean	SD	P-value
Pre-operative	8.4	± 0.7	**< 0.001 HS**
1 week post-operative	1.8	± 0.8	
1 month post-operative	1.4	± 0.5	
4 months post-operative	0.7	± 0.6	

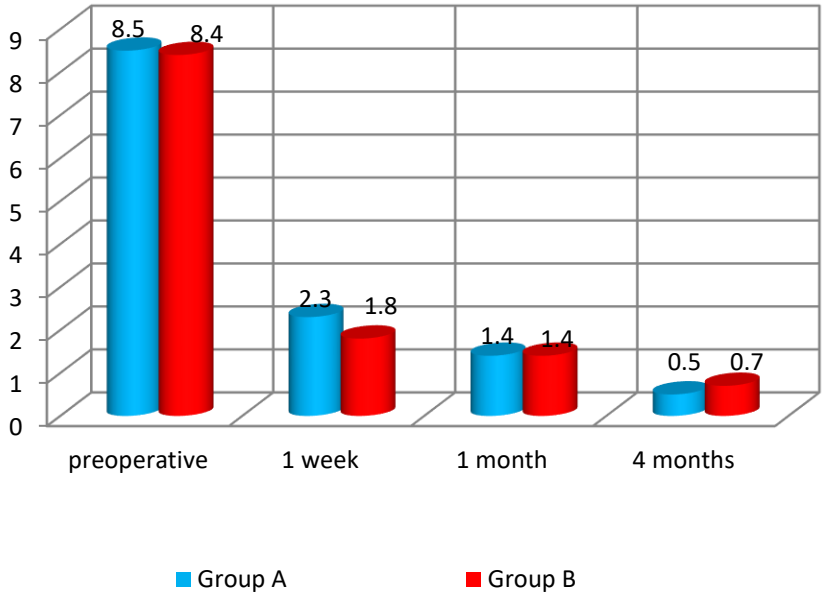

Fig.1.Comparison between both groups as regard nasal obstruction by VAS.

Hyposmia

It was recorded by VAS system. There was no significant improvement in hyposmia in group A (p-value = 0.086) but there was significant improvement in group B (p-value = 0.040). In group (A), 10 patients were complaining of hyposmia with the mean of preoperative VAS score = 2±2.3 while 14 patients were complaining of hyposmia in group (B) with the mean of preoperative VAS score = 2.9±2.7 with no significant difference (p-value = 0.341). The mean of postoperative VAS score in group (A) after 4 months was 0.7±1.4 compared to 1.2±1.9 in group (B) with no significant difference (p-value = 0.289) as shown in (**Table .4**) and **Fig.2**.

Table 4.Comparison between both groups as regard hyposmia by VAS

Variables		Group A	Group B	P-value
Hyposmia (pre-op)	**Mean ± SD**	2.0± 2.3	2.9± 2.7	0.341 NS
Hyposmia (post-op)	**Mean ± SD**	0.7± 1.4	1.2± 1.9	0.289 NS

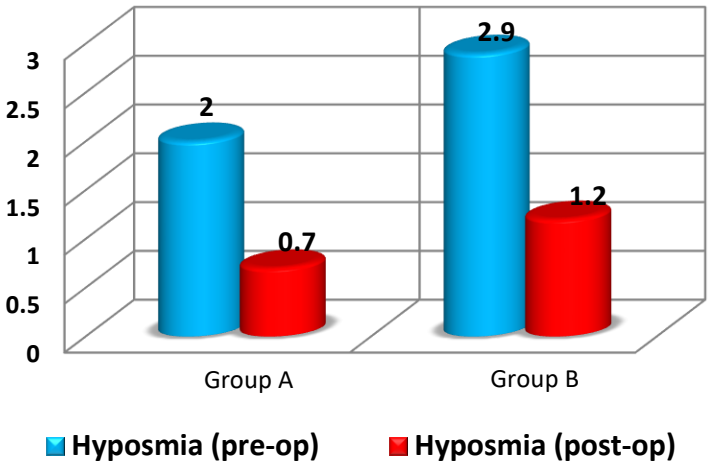

Fig.2. Comparison between both groups as regard hyposmia by VAS

Snoring

It was recorded by VAS system. There was highly significant improvement in snoring in group (A) (p-value < 0.0001) while there was significant improvement in group (B) (p-value = 0.009). In group (A), 14 patients were complaining of snoring with the mean of preoperative VAS score = 3.2±2.7 while 16 patients were complaining of snoring in group (B) with the mean of preoperative VAS score = 3.1±2.8 with no significant difference (P-value = 0.758). The mean of postoperative VAS score in group (A) after 4 months was 0.1±0.3 compared to 1.5±2.6 in group (B) with no significant difference (P-value = 0.086) as shown in (**Table.5**) and **Fig.3**.

Table 5. Comparison between both groups as regard snoring by VAS

Variables		Group A	Group B	P-value
Snoring (pre-op)	**Mean ± SD**	3.2± 2.7	3.1± 2.8	0.758 NS
Snoring (post-op)	**Mean ± SD**	0.1± 0.3	1.5± 2.6	0.086 NS

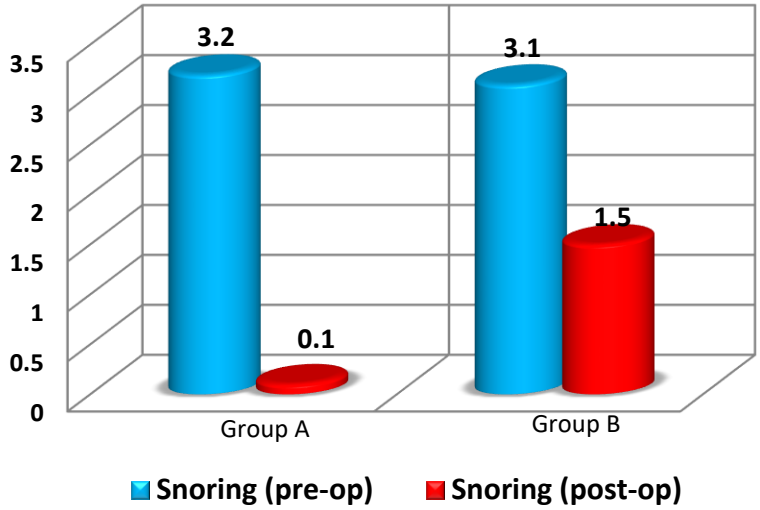

Fig.3. Comparison between both groups as regard snoring by VAS.

Bleeding

Intraoperative bleeding was recorded in 20 patients in group (A) and it was not recorded in any patient in group (B). So intraoperative bleeding was more with partial inferior turbinectomy than with coblation with highly significant difference (p-value < 0.001). Postoperative bleeding was recorded in 12 patients in group (A) and it was recorded in 4 patients in group (B). So postoperative bleeding was more with partial inferior turbinectomy with significant difference (p-value = 0.01) as shown in (**Table.6)** and (**Fig.4)**.

Table 6. Comparison between studied groups as regard bleeding

Variables	Group A (N = 20)		Group B (N = 20)		P-value
Intra-operative bleeding	20	100%	0	0%	**< 0.001 HS**
Post-operative bleeding	12	60%	4	20%	**0.01 S**

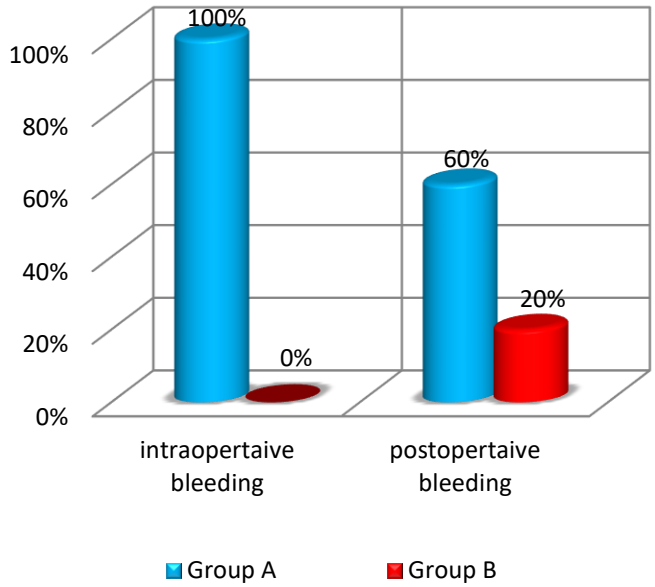

Fig.4.Comparison between studied groups as regard bleeding

Postoperative pain

It was recorded by VAS system 1 week after operation. The mean of postoperative VAS score in group (A) was 8.2±0.8 compared to 3.6±1.4 in group (B). So, postoperative pain was less severe with coblation with highly significant difference (p-value < 0.001) as shown in (**Table.7**) and (**Fig.5**).

Table 7.Comparison between both groups as regard postoperative pain by VAS

Variables		Group A	Group B	P-value
Pain (post-op)	**Mean± SD**	8.2 ± 0.8	3.6 ± 1.4	**< 0.001 HS**

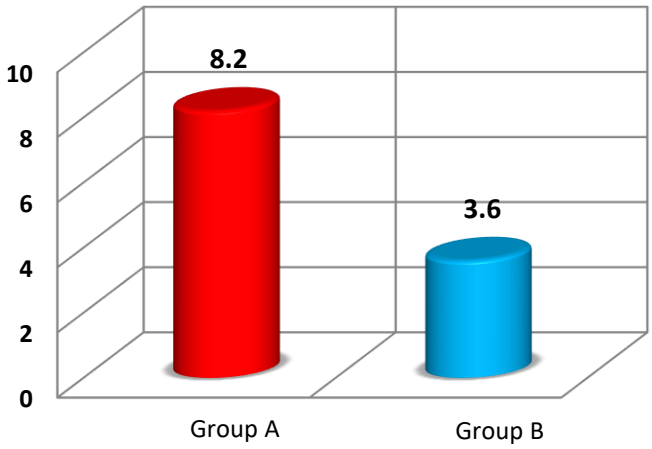

Fig.5. Comparison between both groups as regard post-operative pain by VAS.

Postoperative crustations

They were recorded after 1 week in all patients (100%) in group (A) compared to 12 patients (60%) in group (B). After 3 weeks, they were recorded in 12 patients (60%) in group (A) while they weren't recorded in any patient in group (B). After 2 months, they weren't recorded in any patients in both groups. So postoperative crustations were less with coblation compared to partial inferior turbinectomy with highly significant difference (p-value < 0.001) as shown in (**Table.8**) and (**Fig.6**).

Table 8. Comparisons of crustations follow up in group A and group B

Variables	Follow up						P-value
	(1w)		(3w)		(2m)		
group A	20	100%	12	60%	0	0%	**< 0.001 HS**
group B	12	60%	0	0%	0	0%	**< 0.001 HS**

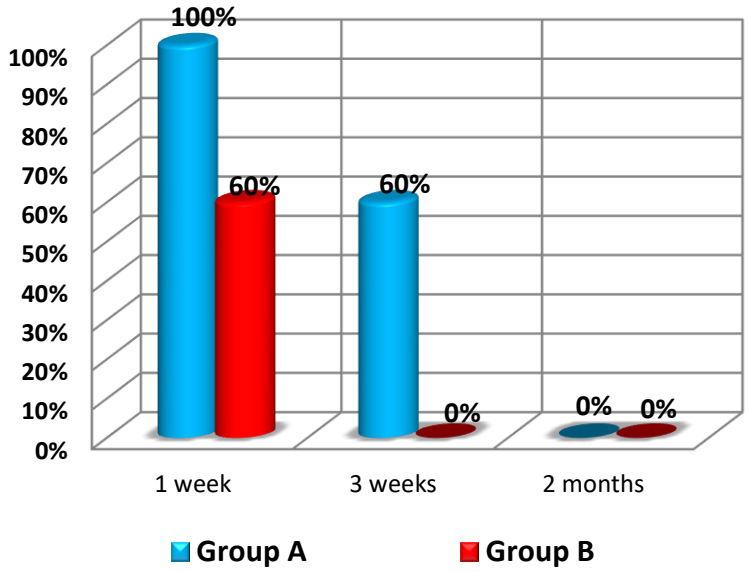

Fig.6.Comparison of crustations follow up in group A and group B.

Discussion

In this study, nasal obstruction improved significantly in both groups postoperatively. However, the improvement was more with coblation than partial inferior turbinectomy after

1 week with no significant difference. After 1 month of treatment, the improvement was equal in both groups with no significant difference while in it was more with partial inferior turbinectomy than coblation after 4 months with no significant difference. These results were close to the results of the study of **Cavaliere et al. (2005)** in which the nasal obstruction improved at the end of the first week postoperatively. Statistically significant improvement was observed at 1 month after treatment in all patients and continued up to 4 months after treatment. Also, the study of **Bakshi et al. (2017)**, which compared the efficacy of surgical turbinoplasty in group (A) with radiofrequency ablation in group (B), agreed with this study in that there was highly significant difference 4 month postoperatively in both groups. However, they disagreed with this study in that there was no statistically significant improvement 1 week postoperatively in both groups and there was a statistically significant difference between the two groups by the 4th month in nasal obstruction. Also the results of this study are in agreement with the study of **Mohamed et al. (2018)** in which there was significant improvement of the mean of nasal obstruction from (30.1±2.48) pre-operatively to (17.62±1.83) 4 months post-operatively. **Francesco et al. (2009)** found that patients after partial inferior turbinectomy had a fast and intense improvement of nasal obstruction. After only 1 week, these patients reported significant improvement in nasal obstruction. Unlike this study, patients underwent coblation showed non-significant improvement of nasal obstruction 1 week postoperatively. Both groups showed statistically significant improvement in nasal obstruction 2 months postoperatively but the improvement was greater with partial inferior turbinectomy (3.6±0.67) than with coblation (5.2±0.98).

Regarding hyposmia in this study, there was no statistical significant difference between preoperative and postoperative hyposmia in group (A) but there was significant difference between preoperative and postoperative hyposmia in group (B). Also, there was no statistically significant difference between both groups 4 months postoperatively. These results agreed with the results of **Bakshi et al (2017)** in that there was no significant difference between both groups regarding hyposmia postoperatively but unlike this study, there was no significant improvement in hyposmia in patients underwent coblation. The results of **Cavaliere et al (2005)** agreed with the results of this study in that there was significant improvement in hyposmia in patients underwent coblation but disagreed with this study in that there was significant improvement in hyposmia in patients underwent partial inferior turbinectomy. **Garzaro et al. (2012) and Assanasen et al. (2014)** also found significant improvement in hyposmia after radiofrequency ablation which lasted for long term.

Regarding snoring in this study, there was highly significant difference between preoperative and postoperative snoring in group (A) while there was significant difference between preoperative and postoperative snoring in group (B). However, there was no statistically significant difference between both groups 4 months postoperatively. These results were close to the results of **Francesco et al. (2009)** in which snoring significantly improved 2 months postoperatively but there was significant difference between coblation and partial inferior turbinectomy. **Liu et al., (2009)** also found significant improvement in

snoring 6 months postoperatively in coblation assisted turbinopalsty which agreed with the results of this study.

Intraoperative bleeding was highly significant with group (A) and postoperative bleeding was significant with the same group (p= 0.01). 1 week postoperatively, no bleeding was detected in both groups. Unlike the results of this study, **Mohamed et al., (2018)** found that just one patient from 50 developed bleeding after partial inferior turbinectomy and no patients were recorded to have postoperative bleeding after coblation with no significant difference between both groups. **Bakshi et al., (2017)** agreed with the results of this study in that 5 from 42 in the surgical turbinoplasty group had significant intraoperative bleeding while none had significant intraoperative bleeding in the coblation group.

In this study, partial inferior turbinectomy was more painful than turbinate reduction by coblation 1 week postoperatively with highly significant difference. This symptom disappeared completely after one month in all patients. These results were similar to the results of **Bakshi et al., (2017)** in which pain is less with coblation. **Cavaliere et al., (2005)** agreed with this study in that postoperative pain was minimal with coblation but unlike this study the difference was not significant. However, the results of this study disagreed with **Gomaa et al., (2015)** study in which the pain disappeared completely 3 months postoperatively and the pain was less severe with patients underwent partial turbinectomy.

Postoperative crustation was less with coblation compared with partial inferior turbinectomy. These results were close to the results of **Sahin et al., (2003)** in which no crusts developed with coblation but dense crusts developed in seven patients after partial inferior turbinectomy. **Mohamed et al., (2018)** found that 84% of patients had crustations till the second week, 16% had till the second month and completely disappeared at the fourth month with partial inferior turbinectomy. However, 10% of the patients had crustations till the second week postoperatively, 90% till the second month and disappeared at the fourth month with coblation. In the study of **Bakshi et al., (2017)** crustations developed in 15 patients in the surgical turbinoplasty group and continued till 6 months in three of them. However, none of the radiofrequency patients developed crustations.

Conclusion

Partial inferior turbinectomy and turbinate reduction by coblation of inferior turbinate are safe and effective methods for relieving nasal obstruction and other associated symptoms such as hyposmia and snoring. Complications including intraoperative and postoperative bleeding, postoperative pain and crustations are less with coblation than partial inferior turbinectomy. Also, coblation has the advantage that it can be done in an outpatient department under local anesthesia.

Conflict of interest

The authors declare no competing interests.

References

- **Abdul Aziz A. (2012).** Efficacy of submucosal diathermy in inferior turbinate hypertrophy. Bahrain Medical Bulletin, 34(1).
- **Assanasen P, Choochurn P, Banhiran W, Bunnag C. (2014).** Radiofrequency inferior turbinate reduction improves smell ability of patients with chronic rhinitis and inferior turbinate hypertrophy. Allergy Rhinol (Providence), 5:12–6.

- **Bakshi S S, Kiruba S M, Surianarayanan G .(2017).** Comparison of the long term efficacy of radiofrequency ablation and surgical turbinoplasty in inferior turbinate hypertrophy: a randomized clinical study. Acta Otolaryngologica, 1651-2251.
- **Cavaliere M, Mottola G, Lemma M. (2005).** Comparison of the effectiveness and safety of radiofrequency turbinoplasty and traditional surgical technique in treatment of inferior turbinate hypertrophy. Otolaryngology Head Neck Surg,133:972-978.
- **Chang CW, Ries WR. (2004).** Surgical treatment of inferior turbinate: new techniques. Otolaryngology Head Neck Surg, 12:53-57.
- **Cingi C, Ure B, Cakli H, Ozudogru E .(2010).** Microdebrider-assisted versus radiofrequency-assisted inferior turbinoplasty: prospective study with objective and subjective outcome measures. Acta Otorhinolaryngol Ital, 30(3):138:143.
- **Francesco-Antonio S, Renzo M, Massimo D. (2009)**. Radiofrequency, high-frequency, and electrocautery treatments versus partial inferior turbinotomy. Arch Otolaryngology Head Neck Surg, 135(8):752-758.
- **Garzaro M, Pezzoli M, Landolfo V, Defilippi S, Giordano C, Pecorari G .(2012).** Radiofrequency inferior turbinate reduction: longterm olfactory and functional outcomes. Otolaryngol Head Neck Surg, 146:146–50.
- **Gomaa M A, Abdel Kerim A R, Aly A (2015).** Comparative Study between partial surgical inferior turbinectomy and sub-mucosal diathermy of inferior turbinate for treatment of inferior turbinate hypertrophy. Otolaryngology, 217 (5): 2.
- **Hol MK, Huzing EH .(2000).** Treatment of inferior turbinate pathology: a review and critical evaluation of different techniques. Rhinology, 38:157-66.
- **Liu C, Ching-Ding T, Fei-Peng L, Kai-Nan L, Hung-Meng H .(2009).** Microdebrider-assisted versus radiofrequency-assisted inferior turbinoplasty. Laryngoscope, 119:414–418.
- **Mohamed E S, Emad M K, Ahmed S, Magdy E S .(2018).** Comparison of endoscopic partial inferior turbinectomy, submucosal radiofrequency volume reduction and inferior turbinoplasty in patients with hypertrophied inferior turbinates. Med. J. Cairo Univ, 86(1): 349-356, 2018.
- **Nease CJ, Krempl GA. (2004)**. Radiofrequency treatment of turbinate hypertrophy: a randomized blinded, placebo-controlled clinical trial. Otolaryngology Head Neck Surg, 130:291-299.
- **Puterman M, Segal N, Joshua B. (2012).** Endoscopic, assisted, modified turbinoplasty with mucosal flap. The Journal of Laryngology & Otology, 126 (05): 525- 8.
- **Şahin B, Şapçi T, Karavus A. (2003)**. Comparison of the effects of radiofrequency tissue ablation, CO2 laser ablation, and partial turbinectomy applications on nasal mucociliary functions. The Laryngoscope,113(3): 514-519.
- **Spector M. (1982)**. Partial resection of the inferior turbinates. Ear, Nose & Throat Journal, 61.4 200-203.
- **Talaat M, El-Sawaby E, Abdel Baky F .(1987)**. Submucous diathermy of the inferior turbinates

in chronic hypertrophic rhinitis. J otolaryngology; 101:452-460.

- **Whitaker E, Menick F .(2002).** Rhinoplasty, turbinate reduction. eMedicine Journal, 3 (5):435-39.