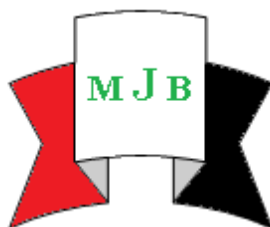


The Effect of Sub-Mucosal Diathermy in Chronic Nasal Obstruction due to Bilateral Inferior Turbinate Enlargement

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Abstract

Background: Nasal obstruction is one of the common presenting symptoms encountered by otolaryngologists and it could be due to septal deviation or turbinate hypertrophy due to vasomotor or allergic rhinitis.

Aim of the study: This study was designed to evaluate the effectiveness and complications of submucosal diathermy on inferior turbinate hypertrophy, using electro-coagulation.

The study carried out in Al-Yarmouk Teaching Hospital / ENT department from (February 2011 to January 2013).

Patients &Methods: After taking history from (100) patients who were complained from nasal obstruction, the state of mucosa, turbinates and septum were examined by (anterior rhinoscopy) and (rigid nasal endoscope) before and after applying local vasoconstrictor agent to the nose. Moderate to severe septal deviation were excluded from this study. Paranasal sinuses plain X-Ray films were done to exclude active rhinosinusitis. After laboratory investigations, and under (GA) with oral endotracheal intubation and throat pack with the aid of headlight, submucosal diathermy of inferior turbinate was done. After completion, each nostril was packed with Paraffin Pack, which was removed (24 hours) post operatively.

Results : (100) patients were included in our study, (56 %) males and (44 %) females. All of them were complaining from nasal obstruction. The subjective improvement in nasal obstruction at (two months) post-operatively was (72 %) with great improvement, (8 %) with partial improvement, and (20 %) for no change. The subjective evaluation of nasal obstruction (one year) post-operatively, revealed symptoms-free for (84 %), partial improvement for (12 %), and patients with no change represent (4%).

Conclusion: Submucosal diathermy is an effective method for decreasing the size of the inferior turbinates. It does not require expensive instrumentation and is a safe, effective procedure for improving nasal breathing in patients with inferior turbinates hypertrophy, but it had no role in alleviating the symptoms of allergic rhinitis or vasomotor rhinitis, like (rhinorrhoea, sneezing) other than nasal obstruction.

Key words: Sub-mucosal diathermy, inferior turbinate enlargement.

تأثير العلاج بالإنفاذ الحراري تحت الغشاء المخاطي في إنسداد الأنف المزمن بسبب تضخم
الزعانف الأنفية السفلى ثنائي الجانب

الخلاصة

المقدمة يعتبر إنسداد الأنف من الأعراض الأكثر شيوعاً والتي يصادفها طبيب الأنف والأذن والحنجرة باستمرار، وهو قد يكون بسبب انحراف الحاجز الأنفي أو تضخم الزعانف الأنفية السفلى بسبب إلتهاب الأنف الحركي الوعائي أو الحساس.

خلفية الهدف انجزت هذه الدراسة لتقييم فعالية ومضاعفات الإنفاذ الحراري للطبقة تحت المخاطية للزعانف الأنفية السفلى باستعمال التخثير الكهربائي وقد أعدت في مستشفى اليرموك التعليمي/ شعبة جراحة الأنف والأذن والحنجرة للفترة من شباط ٢٠١١ الى كانون الثاني ٢٠١٣ .

المرضى وطرق العمل أن هذه الدراسة هي دراسة منظورة تضمنت مئة مريض. بعد أخذ التاريخ المرضي من (١٠٠) مريض والذين يشكون من إنسداد الأنف، تم فحصهم جميعا بواسطة (الناظور الأمامي للأنف) و(الناظور الأنفي الصلب - ٤ ملم - درجة الصفر) قبل وبعد تقطير قطرات إنقباض الأوعية (زايلوميثازولين ٠.١ %) في الأنف . تم فحص الغشاء المخاطي والزعانف الانفية والحاجز الأنفي. لم تشمل الدراسة المرضى الذين لديهم انحراف الحاجز الأنفي المتوسط والشديد . أجريت للمرضى أشعة أكس لفحص الجيوب الأنفية لإستثناء أي التهابات جيبية أنفية حادة . وقد تم تطبيق معايير الإدراج والإستثناء على المرضى والذين كانوا يعانون من إنسداد الأنف بسبب تضخم الزعانف الأنفية السفلى وتم اختيار (100) مريضا . وبعد التحريات المختبرية المناسبة ، تم إجراء عملية الإنفاذ الحراري للزعانف الأنفية السفلى تحت التخدير العام .

النتائج شملت دراستنا (١٠٠) مريضا، (٥٦%) ذكور، (٤٤%) إناث، وجميعهم يعانون من إنسداد الأنف . بالنسبة للتحسن الذاتي للتنفس الأنفي بعد (شهرين) من عملية الإنفاذ الحراري للزعانف الأنفية السفلى ، كانت النتائج (٧٢% تحسن كبير) و (٨% تحسن جزئي) و (٢٠% بلا تغيير). أما بالنسبة للتقييم الذاتي للتنفس الأنفي بعد (سنة) من العملية ، فقد أظهر نسبة (٨٤% بلا أعراض) و (١٢% تحسن جزئي) و (٤% بلا تغيير).

الإستنتاج عملية الإنفاذ الحراري عملية فعالة لتقليص حجم الزعانف الأنفية السفلى، ولا تحتاج الى أدوات مكلفة ، وهي مأمونة وفعالة لتحسين التنفس الأنفي بالنسبة لمرضى تضخم الزعانف الأنفية السفلى. والمرضى الذين يستفيدون من هذه العملية هم الذين يكون لديهم تحسن وقتي للإنسداد الهوائي بعد إستعمال قطرات إنقباض الأوعية الدموية (زايلوميثازولين ٠.١ %). وهذه العملية ليس لها دور في تسكين أعراض التهاب الأنف الحركي الوعائي والحساس (السيلان الأنفي والعطاس) عدا أنسداد الأنف.

Introduction

Nasal obstruction is one of the common presenting symptoms encountered by otolaryngologists and it could be due to septal deviation or turbinate hypertrophy due to vasomotor or allergic rhinitis.

Aim of the Study

To evaluate the effectiveness and complications of submucosal diathermy on inferior turbinate hypertrophy, using electro-coagulation.

Patients and Methods

Selection of Patients

Depending on the history and physical examination, we select (100) patients who had suffered from nasal obstruction, they were seen and evaluated in the outpatient clinic of otolaryngology in AL-Yarmouk teaching hospital between February 2011 and January 2013 and they had been submitted to clinical and endoscopic examination of the nose all

of them were failed to respond to medical treatment for a long period of time (months to years). After applying (Xylocaine spray 10 % to both nostrils), all patients were examined (before and after applying local vasoconstrictor drops – Xylometazoline 0.1% - to both nostrils) by (Anterior Rhinoscopy) and (Rigid Nasal Endoscope – 4 mm – 0 degree)

Inclusion criteria for the patient:

1. Nasal obstruction due to inferior turbinate hypertrophy.
2. Mucosal hypertrophy of both inferior turbinates refractory to medical treatment.
3. Non-complicated allergic rhinitis and vasomotor rhinitis.

Exclusion criteria:

1. Moderate to Severe septal deviation.
2. Active rhinosinusitis.
3. Previous nasal surgery.
4. Nasal polyp, middle turbinate enlargement.

5. Patients who get no relief of airway obstruction after application of local vasoconstrictor drops (Xylometazoline 0.1%)

Method

The procedure was done, under general anaesthesia with oral endotracheal intubation and throat pack with the aid of headlight.

A- Premedication: Topical nasal decongestant (Xylometazoline 0.1% – 2 drops 3 times daily) were given for (one week) before the operation.

B- Position: The patient is placed in reverse Trendlenberg position (head up 15degree)

C- Preparation of the nose

The procedure begins with the application of A cotton pledget impregnated with topical nasal decongestant agent (Xylometazoline 0.1%) was applied before all procedures.

D- Surgical technique: We used a nasal Killian speculum to view the anterior end of the inferior turbinate. A pointed probe (Tilley Lichtwitz antral trocars) was used and touched by a unipolar coagulation diathermy device .It was inserted through the length of the inferior turbinate parallel to nasal floor until the posterior end was reached, then it was withdrawn slowly through the turbinate over a period of (10-20 seconds). Up to three passes of the probe was applied on the medial surface of the hypertrophied inferior turbinate. The procedure was repeated for the other inferior turbinate. After completion, each nostril was packed with Paraffin Pack, which was removed (24 hours) post-operatively.

Post-operative care

Post operatively , the patients were given (Systemic Antibiotics – as a prophylactic – Clavulanic acid 125 mg augmented Amoxicillin 500 mg – 1 tab. x 3) and (Analgesics – Paracetamole 1 tab x 3). No (local or Systemic Decongestants) were given to assess the effect of operation. At first month, Follow up was done (weekly). Then (monthly) for the next two months, then every (three months) for the next nine months. At each visit, the nose was examined by (anterior rhinoscopy - for any bleeding, congestion, edema, and adhesions). Crustations if present were removed. Also (spatula test & cotton wool test) were done to check nasal patency. We strongly instructed the patients to cease smoking and avoid exposure to chemical irritants.

After (1 – 2 months), patients resume their usual treatment for allergic and vasomotor rhinitis.

Results

1. Gender distribution:

Male are more affected 56 patients (56%) than females 44 patients (44%).

2. Age Distribution:

The commonest age group affected was between 21– 30 years (young adults) 44 patients (44%) while the least common age group affected was between 41– 55 years 12 patients (12%).

3. Duration of chief complaint:

Most of the patients have duration of symptoms of 3 years 32 patients (32%).

4. Preoperative symptom (Patient's Complaint):

Table 1 Patient`s Complaint

Complaint	No. of patients	Percentage (%)
Nasal obstruction	100	100
Sneezing	80	80
Rhinorrhea	64	64
Affected by change of weather	64	64
Cough	32	32
Itching (ear/nose/throat)	28	28
Sore throat	24	24
Snoring	24	24
Disturbed Sleep	8	8
Loss of smell	4	4
Headache	4	4

5. Smoking and chemical irritants exposure:

History of chemical irritants exposure was found in 64 patients (64%), while 36

patients (36%) were found to be smokers.

6. Endoscopic findings:

Table 2 Endoscopic Findings (Pre-operatively)

Findings	No. of patients	Percentage (%)
Pale mucosa	64	64
Congested edematous mucosa	36	36
Bilateral inferior turbinate hypertrophy (moderate)	16	16
Bilateral inferior turbinate hypertrophy(marked)	84	84
Septum (straight)	76	76
Septum (mild deviation)	24	24
Middle turbinate enlargement	-	-

7. X-Ray findings:

Table 3 X-Ray Findings (Pre-operatively)

Findings	No. of patients	Percentage (%)
Shadow of inferior turbinate hypertrophy	100	100
Sinus haziness or air fluid level	-	-

Table 4 Subjective complaints of nasal obstruction (Pre-operatively)

State of Nasal Obstruction	No. of Patients	Percentage (%)
Mild obstruction on physical effort	28	28
Moderate obstruction on physical effort	56	56
Obstruction at rest	16	16
Total	100	100

Table 5 Subjective effects of submucosal diathermy of inferior turbinates on nasal obstruction at (two months) (post-operatively)

Effect on Nasal obstruction	No. of Patients	Percentage
Great improvement	72	72
Partial improvement	8	8
No change	20	20
Total	100	100

Table 6 Subjective evaluation of nasal obstruction (one year) (post-operatively)

Effect on Nasal obstruction	No. of Patients	Percentage (%)
Symptoms-free	84	84
Partial improvement	12	12
No change	4	4
Total	100	100

Table 7 Subjective evaluation of symptoms (other than nasal obstruction)(3 months) (post-operatively)

Complaint	No. of patients pre-op.	(%) of patients pre-op.	No. of patients relieved post-op.	(%) of relief post-op.
Sore throat	24	24	20	83.3
Snoring	24	24	20	83.3
Disturbed sleep	8	8	4	50
Rhinorrhea	64	64	4	6.25
Loss of smell	4	4	0	0
Headache	4	4	0	0
Sneezing	80	80	0	0
Itching (ear/nose/throat)	28	28	0	0
Cough	32	32	0	0

Table 8 Congested mucosa (post-operatively)

Duration	No. of Patients	Percentage (%)
1 Week	60	60
2 Week	36	36
3 Week	20	20
1 Month	4	4
2 Month	-	-
3 Month	-	-

Table 9 Oedema (post-operatively)

Duration	No. of Patients	Percentage (%)
1 Week	68	68
2Week	48	48
3 Week	28	28
1 Month	4	4
2 Month	-	-
3 Month	-	-

Table 10 Crustations (post-operatively)

Duration	No. of Patients	Percentage (%)
1 Week	48	48
2 Week	36	36
3 Week	28	28
1 Month	12	12
2 Month	4	4
3 Month	-	-

Table 11 (Bleeding / Adhesion / Pain) - post-operatively

Complication	No. of Patients	Percentage (%)
Pain	16	16
Bleeding	-	-
Adhesion	-	-

Discussion

Great improvement in nasal obstruction (Two months) post-operatively:

The mucosal congestion, oedema and crustation were the main cause of delayed improvement in nasal airway after the operation.

In our study , the subjective improvement in nasal breathing by

submucosal diathermy of inferior turbinates at (two months) post-operatively was (72 %) with great improvement, (8 %) with partial improvement, and (20 %) for no change. Milo Fradis, MD, Shelton Malatskey, evaluated the results of their experience with (SMD) in (two studies) . In their first study (2000), on (51) patients suffering from chronic nasal obstruction.

They found that diathermy demonstrated good results in (78%) of the cases at (2 weeks) postoperatively and in (76%) of the cases (2 months) following the procedure . Patients who had no complaints and had good nasal airflow were not followed-up after 2 months[1]. In their second study (2002), on (91) patients , they have carried out a long-term follow-up . Patients were examined at (2 months) postoperatively and after (1 year), with both subjective and objective assessments of nasal breathing . (Two months) postoperatively (70.3%) experienced subjective improvement in nasal breathing, whereas (80.2%) had good nasal breathing as indicated with the Gertner-Podoshin plate [1].

Symptoms-free (regarding nasal obstruction) (One year) post-operatively:

In our study , the subjective evaluation of nasal breathing (one year) post-operatively, revealed symptoms-free for (84 %), partial improvement for (12 %) , and patients with no change represent (4 %).

Milo Fradis, MD, Shelton Malatskey , in their second study (2002) , on (91) patients , and during the follow-up year , secondary operations were deemed necessary for (16) patients because of unsatisfactory results of the original procedure (so they were excluded from the study).

At the (1-year) follow-up visit, (65 patients) (of the 75) were symptom-free with respect to nasal breathing (86.7 %) and (67 patients) (89.3%) had good nasal breathing as examined with the Gertner-Podoshin plate[1].

Yaseen et al did a study on (40 patients) in the period from (August 2007 to November 2008), about (Thermal reduction of hypertrophied inferior

turbinate) in Al-yarmouk Teaching Hospital / department of otolaryngology. (60 %) of the patients were males and (40 %) were females. Their age ranged from (18 – 50 years) with a mean age of (34 years), and all of them suffer from nasal obstruction. One month after the operation, relief of nasal obstruction was (75 %).

Six months after the operation, the results were (85 %), while at the end of the twelve months the results were (75 %). [2]

Benefit of SMD according to other studies (regarding nasal obstruction):

Vonk Haake & N Piltardcastle PF. (1985), did a study on (60) patients who were operated on by submucosal diathermy of the inferior turbinate and were followed by questionnaire for periods ranging from (1 – 5 years) since surgery . Their results revealed that surgery was of benefit in up to (72 %) of cases [3]. Jones AS . , Lancer JM. (1987) found that submucosal diathermy was effective in the short term (2 months) in reducing nasal resistances to air flow as assessed by Rhinomanometry . There was no significant difference between the nasal resistance prior to surgery and (15 months) after surgery [4]

A study by Rejals (2004) and his colleagues , revealed (36 %) long term benefit in inferior turbinate reduction by diathermy [5]

Congested mucosa post-operatively

In our study, regarding the congested mucosa post-operatively, it was found in (60 %) of patients (one week) post-operatively. (36 %) of patients presented with congestion (two weeks) post-operatively. (20 %) of patients presented with congestion (three weeks) post-operatively, and finally, (one month)

post-operatively (4 %) of patients had congested mucosa.

Yaseen et al , in his study (2007 – 2008) , found congested mucosa in (55 %) of patients (one week) post-operatively , (35 %) of patients (two weeks) post-operatively , (25 %) of patients (three weeks) post-operatively , (5 %) of patients (one month) post-operatively. [2]

Oedema post-operatively

In our study , regarding the oedema , (68 %) of patients presented with oedema (one week) post-operatively . (48 %) of patients had oedema (two weeks) post-operatively. (28 %) of patients presented with oedema (three weeks) post-operatively , and finally , (one month) post-operatively (4 %) of patients had oedema.

Yaseen et al , in his study (2007 – 2008), found edema in (65 %) of patients (one week) post-operatively, (50 %) of patients (two weeks) post-operatively , (25 %) of patients (three weeks) post-operatively , and (5 %) of patients (one month) post-operatively [2].

Crustations post-operatively

In our study, the crustation was found in (48 %) of patients (one week) post-operatively. (36 %) of patients had crust (two weeks) post-operatively. (28 %) of patients presented with crust (three weeks) post-operatively. (One month) post-operatively (12 %) of patients had crust , and finally , (two months) post-operatively (4 %) of patients had crust.

Yaseen et al , in his study (2007 – 2008) , found crustation in (50 %) of patients (one week) post-operatively , (35 %) of patients (two weeks) post-operatively, (30 %) of patients (three weeks) post-operatively , (15 %) of patients (one month) post-operatively , (5 %) of patients (two months) post-operatively ,

and finally , (5 %) of patients (three months) post-operatively [2].

There were neither post-operative bleeding nor adhesion. Pain presented in (16 %) of patients for (3 – 4 days) only.

Conclusions

1. Submucosal diathermy is an effective method for decreasing the size of the inferior turbinates.
2. It does not require expensive instrumentation and is a safe and effective procedure for improving nasal obstruction in patients with chronic obstructive inferior turbinates.
3. This procedure had no role in alleviating the symptoms of allergic rhinitis or vasomotor rhinitis, like (rhinorrhoea , sneezing) other than nasal obstruction.

Recommendations

1. We recommend the use of (acoustic rhinomanometry) in the evaluation of the effect of SMD on the inferior turbinate hypertrophy , for more accurate results (Objective).
2. We should tell the patients that this procedure may have temporary effects.
3. Further studies are required with larger groups of patients and for longer duration of follow up (more than one year), to determine the long term effect of SMD.

References

- 1 - Milo Fradis , MD, Shelton Malatskey, MD , Ibrahim Magamsa , MD , and Avishay Golz , MD . Effect of Submucosal Diathermy in Chronic Nasal Obstruction Due to Turbinate Enlargement .(Am. J. Otolaryngology 2002;23:332-336. Copyright 2002, Elsevier Science (USA)).
- 2 - Ehab Taha Yaseen , Thermal Reduction of Hypertrophied Inferior

Turbinate , The New Iraqi Journal of Medicine , Original Article / ENT , December 2010 ; 6(3): 30 - 3 .

3 - Vonk Haake NP , Hardcastle PF. Submucosal Diathermy of the inferior turbinate and the congested nose . ORL J . Otorhinolaryngeal Relat spec. 1985 ; 47 (4) : 189 – 93.

4 - Jones A.S., Lancer J.M. Does submucosal diathermy to the inferior turbinate reduce nasal resistance to airflow in long term? J otolaryngol 1987 ; 101 (5) , 448 -51 .

5 - Rejals SD, Upile T, Mc Lellan, Bingham B.J. Inferior turbinate reduction in children using Holmium YAG laser. A clinical and histological study. Lasers Surg Med 2004 ;34 (4) , 310 – 4 .