Clinical Otolaryngology
Edited by George G. Browning

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Conclusion

Microscopic ear surgeries are age-old and time-tested techniques. It is difficult to ascertain whether endoscopes can take their place, but it has definitely carved a niche for itself. In India, surgeries for infective ear diseases are given priority because of potential life-threatening complications. In this scenario, an indolent disease like otosclerosis takes a rear seat. Endoscopic surgery can alleviate this suffering by offering an alternative to microscopic surgery, thus improving their quality of life. Moreover, it is a much cost-effective technique especially in developing countries. A centre having endoscopes for nasal surgery can perform ear surgery with the same ones without further investment in microscopes, thus utilising the existing gadgets maximally. An otolaryngologist should be conversant with both techniques to serve the people better, especially in areas with limited resources.

Keypoints

- Stapes surgery is usually done under operating microscopes around the world, but endoscopic stapes surgery has been tried with good results in a few centres across the world.
- A prospective study was conducted on patients undergoing endoscopic stapes surgery. Preoperative and postoperative audiograms were compared and analysed.
- Analysis revealed a statistically significant postoperative improvement in patients who had undergone endoscopic stapes surgery.
- Thus, endoscopic stapes surgery is an effective alternative to microscopic stapes surgery, especially in areas with limited resources, as evident from our study where 93% of the patients had an air-bone gap of 15 dB or less in the postoperative period.

Financial disclosure

None to declare.

Conflict of interest

None to declare.

References


Inferior turbinate mucosal graft combined with radiofrequency for the treatment of nasal hereditary haemorrhagic telangiectasia: Our experience in sixteen patients

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Dear Editor

Hereditary haemorrhagic telangiectasia is a relatively common, under-recognised, autosomal dominant, systemic vasculopathy and is characterised by telangiectasia and arteriovenous malformations of the skin, mucosa and viscera. It affects all ethnic and racial groups, with an overall frequency of one per 5000–10 000 persons.1 Otolaryngologists play a key role in the management of this disease, as more than 90% of patients develop epistaxis, primarily between the 3rd and 4th decades.2

Otolaryngologists developed different medical and surgical treatment options, including septal dermoplasty,3 laser cauterisation,4 and microvascular free flaps.5 No method has resulted in a complete cessation of epistaxis, and the reporting of long-term outcomes has been limited.6 Radio-
frequency coagulation is a relatively new method for the management of epistaxis, and to the best of our knowledge, it has never been used to treat nasal telangiectasias.

The only definitive treatment for hereditary haemorrhagic telangiectasia is the replacement of the fragile nasal mucosa with stronger mucosa; currently, this is accomplished using septal dermoplasty and modified septal dermoplasty procedures. Although these methods have yielded successful results in reducing epistaxis, destruction of the nasal mucosa, rendering the nose susceptible to complications, is still a problem. Therefore, it seems that the ideal treatment would be to replace the diseased parts of the nasal mucosa with stronger and healthy nasal mucosa.

This study evaluates the feasibility, safety and presents the results of using the inferior turbinate mucosa as a graft combined with radiofrequency coagulation for the treatment of nasal telangiectasias.

**Patients and methods**

This study was approved by the local research ethics committee prior to recruitment. Between 2006 and 2010, sixteen patients with hereditary haemorrhagic telangiectasia were enrolled in the study. Preoperative data were recorded, with a special focus on the intensity and frequency of epistaxis; the numbers of blood transfusion(s), if any; and the need for medical treatment.

The intensity and frequency of epistaxis in the 4 weeks prior to admission were graded into three categories according to Bergler et al.7 (Table 1) and were used to compare pre- and postoperative bleeding severity.

The Curacao criteria, developed by The Scientific Advisory Board of the Hereditary haemorrhagic telangiectasia Foundation International in 1999,8 were applied to our patients to classify the diagnosis of hereditary haemorrhagic telangiectasia. The Curacao criteria include epistaxis, telangiectasias, visceral lesions, and family history. Diagnosis is classified as ‘definite’ if at least three criteria are met, ‘possible’ or ‘suspected’ if two criteria are met, and ‘unlikely’ if fewer than two criteria are met.

The saccharin test was performed before the operation using the method modified by Rutland and Cole9 with an additional modification; where the saccharin particle was placed on the anterior septum just posterior to the mucocutaneous junction instead of on the inferior turbinate. The elapsed time from the placement of the particle to the initial sweet taste perception was recorded in minutes.

The selection criteria were as follows: all patients had a definite diagnosis of hereditary haemorrhagic telangiectasia, with no other local or systemic causes of epistaxis; and all patients had nasal telangiectasias concentrated primarily on the anterior cartilaginous aspect of the septum, with sporadic lesions elsewhere in the nose (Fig. 1). All patients were operated on by the same author.

**Operation**

Under general anaesthesia, the posterior 2–3.5 cm of the inferior turbinate was partially excised (Fig. 2a). The mucosa of the excised portion was dissected from the underlying tissue (Fig. 2b) resulting in a sizable graft (Fig. 2c), followed by the application of cotton packs soaked with adrenaline (1/200 000) to achieve haemostasis. One turbinate may be sufficient for grafting both sides; if not, another partial inferior turbinectomy on the opposite side should be performed.

The mucosal graft was flattened by gentle pressure (Fig. 2c) and prepared for trimming to the desired size, which ranged from 1.5 X 2 cm to 2.5 X 3.5 cm. Killian’s incision was made on the left side, followed by the elevation of the mucosal flap, cartilage incision and elevation of the mucosa only on the right side to the bony part of the septum. The target areas on both sides of the septum were then trimmed; the target areas were usually oval areas of 1–2 X 1–3 cm in which the telangiectasias occurred in high concentrations. The underlying perichondrium and cartilage were left intact on both sides.

The graft was sized to be larger than the defect by at least 3 mm in two dimensions; it was inserted through the incision so that its edges were under the edges of the mucosal defect (Fig. 3a,b). The other side was grafted in the same manner. The grafts were then fixed in place with at least two 4-O chromic sutures, with additional suture(s) at the centre. After fixation, every telangiectasia observed in the nasal cavity was cauterised by radiofrequency bipolar coagulation (RF Cautery, Basco India), followed by internal silastic splinting and light nasal packing.

**Postoperative**

The pack was removed after 24 h, and the splint was removed after 7 days. Prophylactic antibiotics were prescribed for a week, paracetamol was prescribed as needed. Instructions to avoid forcible nose blowing, sneezing and

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**Table 1.** Grading of epistaxis according to Bergler et al.

<table>
<thead>
<tr>
<th>Intensity of bleeding</th>
<th>Frequency of bleeding</th>
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<tbody>
<tr>
<td>Grade 1: slight stains on the handkerchief</td>
<td>Grade 1: less than once a week</td>
</tr>
<tr>
<td>Grade 2: soaked handkerchief</td>
<td>Grade 2: a few times a week</td>
</tr>
<tr>
<td>Grade 3: bowel or similar utensil necessary</td>
<td>Grade 3: more than once a day</td>
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</table>
nasal drops were given. Nasal washing was initiated on the 5th day. The saccharin test was performed after 12 and 24 months.

The patient’s state at 24 months after the procedure was taken as a point of assessment. Epistaxis intensity and frequency in the 4 weeks prior to assessment, saccharin test

Fig. 1. (a,b) Anterior rhinoscopy showing the telangiectasia on the Little’ area. (c) Endoscopy of the right side of the nose showing concentration of telangiectasia on the anterior part of the septum with sporadic lesions on the other sites. (d) Magnified picture of a lesion showing 1–2 mm elevated red spot.

Fig. 2. (a) The partially excised posterior part of the inferior turbinate. (b) Separation of mucosa from the underlying tissues. (c) The graft before trimming.
results and other measures of procedural effectiveness were compared with the preoperative results.

**Results**

The cases included five males and 11 females, with a mean age of 34.4 years. All patients suffered from bilateral anterior epistaxis of varying frequency and intensity. The median follow-up period ranged from 25 to 48 months (median 31.68 months). After the procedure, the frequency and intensity of epistaxis decreased in all patients (Tables 2, 3). Seven patients had received at least one unit of blood prior to the procedure, whereas no patients received blood postoperatively.

In all cases, nasal crusting was noted for 3–5 weeks. Graft displacement occurred on one side in the early weeks in five cases. The graft was repositioned in the outpatient clinic and kept in position with light pack for 2 days. Infection occurred in four cases and was managed with both a short course of ciprofloxacin and nasal packs with sodium fusidate ointment. Healing time ranged between 3 and 5 weeks and depended primarily upon the graft size and the occurrence of infection or displacement (Fig. 4a,b). No patients complained of foul odour in the nasal cavity. There were no cases of septal telangiectasia.

![Fig. 3. (a) Inserting the graft to the right side through the incision in the left side. (b) The graft in place in the right side after trimming of septal telangiectasia.](image)

<table>
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<tr>
<th>Pt. No.</th>
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of graft rejection, contraction, septal perforation or atrophic rhinitis. Subjectively, all patients stated that their quality of life improved.

The mean time determined by the preoperative saccharin clearance test was 17.3 min; at 1 year postoperatively, the mean time was 24.5 min, and at 2 years, it was 18.55 min (\(P > 0.05\)). The average duration of the procedure was 89 (±13.5) minutes.

Six cases were followed up for more than 36 months. They demonstrated the formation of newly formed telangiectasias on the graft periphery in four patients and on the anterior third of the inferior turbinates in two patients. These telangiectasias caused epistaxis of grade 2 intensity (soaked handkerchief) and grade 1 frequency (less than once a week). Those patients were categorised under grade 1 intensity and frequency at the end of the 24th month follow-up. These telangiectasias were cauterised successfully by radiofrequency bipolar diathermy under local anaesthesia.

**Discussion**

Using inferior turbinate mucosa to replace the bleeding area on the septum combined with radiofrequency coagulation for other bleeding sites resulted in a reduction in the intensity and frequency of epistaxis and an improvement in the quality of life with minimal morbidity.

The replacement of the fragile septal mucosa with a free inferior turbinate mucosal graft was stable throughout the follow-up period. The choice of the graft was based on the general similarity of the conchal mucosa to the septal mucosa. This choice maintained the nasal physiology to the greatest extent possible, as indicated by the insignificant change in the saccharin test after 24 months postoperatively. Additionally, partial excision of the posterior aspect of the inferior turbinate was not associated with observable complications. This is in contrast to the unmodified septal dermoplasty technique, in which skin is used to cover at least a portion of the septum; this technique frequently encounters problems with the desquamation of cells and the absence of cilia.

At the time of surgery, the graft had 1–3 spots of telangiectasias in seven patients. These telangiectasias disappeared during the follow-up period. This disappearance may be attributed to the loss of their feeding vessels during dissection of the turbinate mucosa from the underlying tissue and also may be due to postoperative fibrosis.

In our study, the graft did not replace all of the nasal mucosa exhibiting telangiectasias; the lesions were seen concentrated primarily on the anterior half of the septum, which was successfully replaced with the graft, while radiofrequency was used to coagulate every other lesion observed in the nasal cavity.

Radiofrequency coagulation is a relatively new method for the treatment of epistaxis and has the advantage of causing minimal thermal damage to the surrounding mucosa and submucosal structures. The therapeutic effects of radiofrequency on epistaxis were investigated and compared with those of laser treatment, the results of these techniques were found to be similar, but radiofrequency was simpler, easier to perform and less expensive than laser treatment. Radiofrequency coagulation has the advantage of being amenable to the treatment of all observed telangiectasias regardless of the location in the nose. Radiofrequency can be performed and repeated under local anaesthesia in the outpatient clinic in cases of recurrence.

There were no cases of septal perforation, primarily attributed to the preservation of the septal perichondrium.

**Table 3.** Comparison between pre- and postoperative frequency and intensity of bleeding

<table>
<thead>
<tr>
<th>Number of patients</th>
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<th>Grade2</th>
<th>Grade3</th>
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<td>6</td>
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<tr>
<td>Postoperative</td>
<td>12</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Intensity Preoperative</td>
<td>1</td>
<td>8</td>
<td>7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postoperative</td>
<td>13</td>
<td>3</td>
<td>0</td>
<td></td>
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</table>

**Fig. 4.** (a) The right (graft) side after 2 years postoperative. (b) the left side after 2 years in the same patient.
during dissection. Also, there were no cases of atrophic rhinitis as the excised portion of the inferior turbinate was on the posterior third away from the nasal valve area, and the excision was partial so that the volume of the turbinate was not seriously reduced.

Postoperative changes in the saccharin test were insignificant, reflecting the return of nasociliary movement to normal. This result is further evidence of the physiologic advantages of this procedure.

Keypoints

- Hereditary haemorrhagic telangiectasia is a relatively common vasculopathy, more than 90% of patients develop epistaxis.
- Septal dermoplasty procedures yielded successful results in reducing epistaxis but also resulted in the destruction of the nasal mucosa. Therefore, it seems that the ideal treatment is to replace the diseased nasal mucosa with healthy nasal mucosa.
- In this study, the mucosa from the posterior inferior turbinate was used to replace the telangiectic area on the nasal septum in 16 patients along with radiofrequency coagulation on other areas.
- The frequency and intensity of epistaxis were graded into three categories and were used to compare pre- and postoperative severity where grade I is the least in severity.
- Preoperative grade I frequency included two patients and preoperative grade I intensity included one patient. Postoperative grade I frequency and intensity included 12 and 13 patients, respectively. There were no cases of graft rejection, septal perforation or atrophic rhinitis.

Conflicts of interest

In the Egyptian University Hospitals, services are performed free of charge, so there are no financial considerations; there are also no conflicts of interest.

References


Powered saline irrigation is useful for endoscopic removal of fungus balls in maxillary sinuses: Our experience in fifty patients


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Dear Editor,

Paranasal sinus fungus balls (mycetomas) are an extramucosal mycosis that usually affect immunocompetent people and are most frequently found in the maxillary
Inferior turbinate mucosal graft combined with radiofrequency for the treatment of nasal hereditary haemorrhagic telangiectasia; Our experience in sixteen patients

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الملخص العربي:

يعتبر مرض توسع الشعيرات النزفية الوراثي بالأنف خللاً شائعاً نسبياً بالأوعية الدموية، ويعاني أكثر من 90 بالمائة من مرضى هذا الخلل من نزيف بالأنف.

يؤدي رأب الحاجز الأنفي بالجلد إلى تقليل نزيف الأنف لكنه من جهة أخرى يؤدي إلى تدمير الغشاء المخاطي المبطن للأنف. ويبدو أن العلاج الثانوي لهذا المرض يتمثل في استبدال الغشاء المخاطي المريض بغشاء مخاطي صحي من الأنف نفسه.

في هذه الدراسة تم استخدام الجزء الخلفي من القرنية الأنفية السفلية في إحلال الغشاء المخاطي المريض بالحاجز الأنفي جنبًا إلى جنب مع الترددات الراديوية لتختبر الأمانكن الأخرى بالأنف في ستة عشر حالة. تم تقسيم معدل حدوت النزف وشدته إلى ثالث درجات وتم استخدام هذا القياس لمقارنة ما قبل الجراحة وما بعدها حيث كانت الدورة الأولى هي الأقل في الشدة.

قبل الجراحة، كانت الدورة الأولى في معدل النزف تشمل حالتين والدرجة الأولى في شدة النزف تشتمل حالة واحدة فقط، بينما بعد الجراحة، كانت الدورة الأولى في معدل النزف تشمل اثنتي عشر مريضاً والدرجة الأولى في شدة النزف تشمل ثلاثه عشر مريضاً ولم توجد أي حالات طرد للرقعة ولا ثقب بالحاجز الأنفي ولا ضمور بالغشاء المخاطي بالأنف.

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التقدم للرقعة
أ.د/ محمد عبد العلي

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