Microdebrider Assisted Partial Inferior Turbinectomy; Advantages Over the Conventional Method

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Abstract

Objective: To compare the safety and efficacy of microdebrider assisted partial inferior turbinectomy with the conventional turbinectomy in patients with inferior turbinate hypertrophy.

Design: Prospective randomized single blinded study.

Setting: Academic Medical Center.

Patients & Methods: Sixty patients with nasal obstruction and bilateral hypertrophied nasal turbinates that was refractory to medical treatment were included. History taking, clinical assessment and preoperative CT scan of the paranasal sinuses were done for all patients. Patients were randomly assigned to receive microdebrider partial turbinectomy (n=30) or conventional surgical turbinectomy (n=30).

Main Outcome Measures: Operative time, blood loss, subjective improvement of the patients symptoms and post operative complications.

Results: The 2 groups were comparable in age and sex. The operative time and operative blood loss was less in the microdebrider group (p<0.001). Follow-up visit after 3 months revealed improvement in 93.3% of the patients in the microdebrider group vs 96.7% in the surgical group. There was no difference in the incidence of post operative complications between the 2 groups.

Conclusions: Partial turbinectomy with the microdebrider is faster than surgical partial turbinectomy & with less blood loss. We advise to use the microdebrider as routine method for treating nasal turbinates hypertrophy.

Key Words: Endoscopic – Microdebrider – Turbinectomy.

Introduction

NASAL obstruction, although not life threatening, can interfere with quality of life. Enlargement of the inferior turbinates is a common cause of obstruction of the nasal airway. Turbinate surgery is an effective treatment for chronic nasal obstruction [1]. Many techniques of turbinate reduction have been performed, including partial or total turbinate resection, cauterization, cryotherapy, laser therapy, and radiofrequency ablation [2-6]. The multiplicity of techniques indicates the lack of consensus on the "gold standard" for inferior turbinate reduction.

It has been reported that submucosal turbinectomy is an excellent procedure for reducing not only nasal congestion but also sneezing and rhinorrhea in patients with perennial allergic rhinitis [7,8].

A microdebrider allows us to effectively remove the bone and soft tissue because its rotation motor can be connected to different types of dissectors and drills. In addition, this tool enables us to obtain excellent surgical visualization because its attached aspirator absorbs the resected material along with any blood, keeping the site free of debris. Furthermore, Microdebriders help to reduce adjacent tissue damage because there are refrigerants perfused within the protection tube [9].

The microdebrider, which has been widely used in nasal surgery, is supposed to provide real-time suction with the ability of precise tissue resection [10]. Although several studies proposed the feasibility of using the microdebrider in inferior turbinate surgery, the intraoperative differences between the use of microdebrider & the classic turbinectomy remained unexplored. The purpose of this study was to evaluate the differences between both techniques.

Patients and Methods

This prospective randomized study was conducted at the Saudi German Hospital in Jeddah; Saudi Arabia during the period between November 2008 and June 2010. The study was approved by
the local ethics committee after taking informed consents from the patients.

60 patients (18-52 years) with the diagnosis of inferior turbinate hypertrophy, all of them had nasal obstruction not responding to medical treatment (oral antihistamines, oral decongestants and local steroids for 1 month).

Patients were subjected to complete workup including a thorough history of medical therapy, nasal endoscopy, and CT scan of the paranasal sinuses. Patients with a history of previous turbinate surgery, chronic sinusitis, deviated nasal septum and nasal polyps were excluded from the study.

Thirty patients underwent microdebrider assisted partial inferior turbinectomy and the other 30 underwent surgical partial inferior turbinectomy. The turbinectomy technique (surgical vs. the microdebrider) was randomized by the attending surgeon based on odd number for surgical and even number for microdebrider. All procedures were performed by the first author, the patients were blinded to the technique used.

Surgery was done under general hypotensive controlled anesthesia with the patients positioned in the 15° head up position. Preoperative nasal decongestion for 10 minutes was done using cottonoids soaked in 1:10000 epinephrine. The rigid 4mm telescopes of different angles (0° and 30°) were used in addition to the endoscopic set of instruments.

In the microdebrider group, hypertrophied mucosa of the inferior turbinate was trimmed with the Xomed Power System (XPS) 4mm cutting blade at a speed of 3000rpm in oscillate mode. In the surgical group, the turbinate was fractured under endoscopic guidance, angled scissors was used to resect bone and soft tissue from the posterior aspect of the turbinate. After tissue removal via either technique, electrocautery was used for hemostasis.

Intraoperative parameters recorded were operative time and blood loss. The time in minutes was recorded for each patient for tissue removal, hemostasis, and total time. Precise blood loss was calculated by recording the exact amount of irrigation used and the exact volume of blood and irrigation in the suction canister.

For hemostasis, a sponge pack (Merocel) (Urban and Fischer Verlag, Munich, Germany) was inserted. The patients were discharged on the same day and the packs were removed after 48 hours. Patients were encouraged to rinse the nasal cavity several times a day for 2 weeks.

Patients came for follow-up weekly in the 1st month then monthly in the next 2 months, the patients were given a questionnaire to check for changes in nasal obstruction after 3 months (marked improvement, mild improvement, no change or worse) with reporting of any post operative complications.

Statistical method: Data was coded and entered using the statistical package SPSS version 15. The data was summarized using descriptive statistics: Mean, standard deviation, minimal and maximum values for quantitative variables and number and percentage for qualitative values. Statistical differences between groups were tested using Chi Square test for qualitative variables, independent sample t-test for quantitative normally distributed variables while Nonparametric Mann Whitney test was used for quantitative variables which aren’t normally distributed. p-values less than or equal to 0.05 were considered statistically significant.

Results

The 2 groups were comparable in age and sex. The microdebrider group had 60% males, whereas the surgical group had 66% males. Demographic and operative data of the patients were shown in Table (1).

Blood loss was statistically different between the 2 groups, 71mL (range, 38-273mL) for the microdebrider vs 161mL (range, 66-445mL) for surgical; p<0.001 (Fig. 1).

After 3 months, 26 patients (86.6%) in the microdebrider group versus 27 patients (90%) in the surgical group reported marked improvement of nasal obstruction, 2 patients (6.7%) in both groups reported mild improvement, 2 patients (6.7%) vs 1 patient (3.3%) reported no change and no patient reported worsening of nasal obstruction, the difference was not statistically significant (p value >0.05).

No patient had any postoperative bleeding in the microdebrider group after pack removal. Two patients of the surgical group (6.7%) showed secondary hemorrhage 1 week after surgery which was controlled by antibiotics and nasal packings. We did not encounter any crusting, foul odor, synechia or atrophic change during the next 3 months in either group. The difference was not statistically significant (p=0.472).
Table (1): Demographic and operative data.

<table>
<thead>
<tr>
<th></th>
<th>Microdebrider group</th>
<th>Surgical group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>34.6±2.07</td>
<td>34.3±1.26</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Gender M/F</td>
<td>60/40</td>
<td>66/34</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Operative time (min)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Removal time</td>
<td>6.3±1.28</td>
<td>5.55±1.07</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>- Hemostasis time</td>
<td>2.5±0.53</td>
<td>10.2±2.3</td>
<td>&lt;0.05</td>
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<tr>
<td>- Total Time</td>
<td>8.8±1.46</td>
<td>15.75±3.22</td>
<td>&lt;0.05</td>
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Discussion

Nasal obstruction remains a significant problem and there are many techniques to treat the condition. However, there are no existing treatments that have proven to be this effective during this long period of time [11].

In evaluating the various methods of turbinate reduction, we must consider the function of the turbinate. All methods should be judged by two basic criteria: The efficacy of the technique in alleviating breathing obstruction and the side effects that occur in the short and long term [12].

The use of a microdebrider for the surgical treatment of hypertrophic turbinates was first reported by Davis and Nishioka [13] in 1996, since that time, several studies were conducted to assess its efficacy and safety, these studies were either using microdebrider as the only modality for turbinate reduction [11,13-16] or comparing it with other modalities e.g. submucosal resection [17,18] or radiofrequency [19-23].

The paucity of studies comparing the microdebriders with the conventional surgical instruments encourages us to conduct this study in which we recruit 30 patients with inferior turbinate hypertrophy excluding patients with history of previous turbinate surgery, deviated septum, chronic sinusitis and nasal polyps, patients were randomized into 2 equal groups with blinding the patients about the technique used.

We used the microdebrider extraturbinally like few studies [13,16,23], the rest of the studies used it intraturbinally.

The operative time was significantly less in the microdebrider group which was due to difference in hemostasis, this is logical due to the suction/shaving action of the microdebrider, which draws loose tissue into the window, as opposed to the pushing/cutting action of the surgical instruments, which leave more damaged tissue behind, this difference was reflected on the difference of operative blood loss.

Subjective assessment of the patients symptoms 3 months post operatively revealed significant improvement of both groups with no difference in between, this was similarly reported by most of the previous studies which was based also on objective assessment of the nasal resistance by rhinomanometry or acoustic rhinometry.

Post operative complications was not different between the 2 groups, only 2 cases of secondary hemorrhage in the surgical group. We did not encounter any crusting, foul odor, synechia or atrophic change during the next 3 months, though our technique is not considered as mucosal sparing as the intraturbinal microdebrider, submucous resection and radiofrequency.

Lack of objective assessment of nasal obstruction is considered one of the limits of our study, but we tried to substitute it with assessment of operative time and blood loss which was not adequately explored in the previous studies.

There are several advantages to using a Microdebrider, since the large, well-demarcated mucosa can be removed because the surgeon's vision is not obstructed by any bleeding. There is also a shorter operation time, a reduction in complications and an improvement of surgical outcomes.

Conclusion:

Partial turbinectomy with the microdebrider is faster than surgical partial turbinectomy with less blood loss and more precise tissue removal & mucosal preservation.

Summary:

- Hypertrophy of nasal turbinates is one of the most common causes of nasal obstruction.
- Partial turbinectomy with the microdebrider allows us to obtain excellent surgical visualization.
• Partial turbinectomy with the microdebrider is faster than surgical partial turbinectomy & with less blood loss.
• Surgeon satisfaction with the microdebrider was higher than classic endoscopic surgery.
• We advise to use the microdebrider as routine method for treating nasal turbinates hypertrophy.

References