Carbon Dioxide Laser Versus Bipolar Electrocautery for the Treatment of Inferior Turbinate Hypertrophy

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Abstract

Introduction

When the turbinate swelling becomes irreversible, it is refractory to both local and general medical treatment. In all these cases, inferior turbinate surgery may be a choice. Various surgical treatments available are total or partial turbinectomy, turbinoplasty, sub mucosal resection, laser-assisted turbinoplasty, cryosurgery, argon plasma surgery, electrocautery.

Material and method: 94 patients with symptomatic hypertrophic inferior turbinates were studied from October 2016 to January 2018, 51 patients underwent CO2 Laser ablation and 43 patients underwent BEC. Pre and Postop NOSE scale for obstruction, VAS Score for pain and endoscopic examination was done was done for comparing the two procedures.

Results Decrease in obstructive symptoms was significant in both the groups. Pain was significantly lower in laser group as compared to BEC group. Edema and crusting in the turbinate or bleeding was not present in any of the groups.

Conclusion Both procedure give symptom relief in patients. Pain is less in patients treated with CO2 laser and thus is a preferred method.

Introduction

Chronic nasal obstruction is a common complaint often caused by hypertrophy of the inferior turbinates. Chronic hypertrophic rhinitis is one of the most common problems encountered in rhinology [1, 2]. Even if it is not life-threatening, the disease has a major impact on patients’ quality of life [3, 4]. Epidemiologic studies in European countries have shown that up to 20% of the population has chronic nasal obstruction caused by turbinate hypertrophy [5]. There are many causes of hypertrophic turbinate, the most common being allergic and nonallergic nasal hyper reactivity and septal deviation [6]. In most of the cases, pharmacologic therapy is the treatment of choice. However, when the turbinate swelling becomes irreversible, it is refractory to both local and general medical treatment. In all these cases, inferior turbinate surgery may be a choice [7]. Turbinate surgery has been reported as the eighth common procedure in otolaryngology practice [8]. A number of surgical treatments are available for the treatment of nasal obstruction secondary to inferior turbinate hypertrophy, including total or partial turbinectomy, turbinoplasty, sub mucosal resection, laser-assisted turbinoplasty, cryosurgery, argon plasma surgery, corticosteroid injections, electrocautery with monopolar and bipolar techniques, and radiofrequency (RF) volumetric tissue reduction [9-11]. During the
past years, different types of lasers have been developed - CO₂ laser, diode laser, N-YAG and Argon-plasma lasers - all of them achieving good functional results. The aim of this study was to compare the efficacy of CO₂ LASER and bipolar electrocautery (BEC). Patients with symptomatic inferior turbinate hypertrophy treated with either of these procedures were also evaluated in terms of postoperative morbidity.

Material and Methods

From October 2016 to January 2018, 94 patients were treated for symptomatic inferior turbinates. 51 patients (24 women, 27 men) who underwent CO₂ Laser ablation and 43 patients (22 women, 21 men) who underwent BEC were recruited. Inclusion criteria for both groups were nasal obstruction caused only by inferior turbinate hypertrophy and age over 18 years. Patients with deviation of the nasal septum or diseases such as allergic rhinitis and sinonasal infections were excluded. Subjective assessments of nasal patency were determined using NOSE (NASAL OBSTRUCTION SYMPTOM EVALUATION) scale, and postoperative morbidity, (edema, nasal bleeding, and crusting) by endoscopic examination at 1 week and 2 months. For BEC, a bipolar probe delivering 20 W of energy was inserted between the submucosa and periosteum in the anterior, middle, and posterior portions of the turbinate. Bipolar cautery was stopped when minimal coagulation of the nasal mucosa was achieved, as determined visually by whitening of the treated tissues. The conchal and peristeal mucosae were preserved. In CO₂ laser evaporation, power was kept at 4 watts and Spotting was done on anterior part of inferior turbinate while complete evaporation of posterior part of turbinate was done. Patients of both groups were asked to define the level of pain and discomfort by using the Visual Analog Scale (VAS) postoperatively at 1 week. VAS is a scale of 10 cm that is used to grade sensitivity, labeled at the extremes with no pain at the 0 cm end of the scale and severe pain at the 10 cm end of the scale. Subjects were asked to place a mark on the 10 cm line at a location between no pain and severe pain ends. Pain levels were evaluated for both groups at 1 week and 2 months.

Results

The mean age of the patients was 31.08 ± 6.3 years in the CO₂ laser group and 29.9 ± 56 years in the BEC group. Total of 46 patients were females while 48 patients were males. 51 patients (24 women, 27 men) who underwent CO₂ Laser ablation and 43 patients (22 women, 21 men) who underwent Bipolar electrocautery were studied.

<table>
<thead>
<tr>
<th>Method</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(CO₂) Laser evaporation</td>
<td>12.1±1.30</td>
<td>3.14±1.40</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Bipolar electrocautery</td>
<td>12.3±0.9</td>
<td>3.51±1.6</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

The postoperative NOSE Score decreased significantly in both the procedures.

The difference between the VAS Score at 1 week between the two procedures was significant. There was less pain complained by patients operated upon by CO₂ Laser than with bipolar cautery at 1st week. At 2 months the difference between the pain between two procedures was not significant.

On endoscopic examination, no bleeding was observed in either group. Edema and crusting in the turbinate disappeared in all patients by the end of the first week.

Discussion

Inferior turbinate hypertrophy is the most common cause of chronic nasal obstruction. When conservative medical treatment options fail in patients with inferior turbinate hypertrophy, reduction of the inferior turbinate can be performed using surgical techniques. Laser-assisted turbinate surgery has the advantages of limited tissue trauma and reduced bleeding. This prospective study was done From October 2016 to January 2018 in dept of Otorhinolaryngology and head and neck surgery GMC Srinagar. 94 patients with symptomatic hypertrophic inferior turbinates were studied. 51 patients...
with hypertrophic inferior turbinate underwent CO₂ Laser ablation while 43 patients underwent BEC. The mean age of the patients was 31.08±6.3 years in the CO₂ laser group and 29.9±56 years in the bipolar electrocautery group. Subjective improvement in the symptoms of patients was determined by the difference between their preoperative and postoperative NOSE (NASAL OBSTRUCTION SYMPTOM EVALUATION) score. In our study it was seen that there was a significant reduction in the NOSE score postoperatively in both the groups, in CO₂ laser group the postoperative mean being 3.14±1.40 as compared to the preoperative mean of 12.1±1.30 which was seen to be statistically significant (p<0.05). Also in BEC group the mean postoperative score was seen to be 3.51±1.6 compared to mean preoperative score of 12.3±0.9 which was also statistically significant (p<0.05). A study done by Mansi Taneja [12] et al. where 20 patients underwent bipolar cautery and were evaluated on the 7th post operative day showed Remarkable improvement in nasal obstruction and quality of life after treatment with bipolar cautery. According to study done by B M Lippert [13], where One hundred and eighty-four patients with nasal obstruction due to hypertrophied inferior turbinates were treated with the CO₂ laser. Six months after laser surgery, 87.5% had excellent or good results. After one year, 82.1% of the patients were satisfied, and after 2 years 80.4% were satisfied. The procedure involved little bleeding, no pain. In our study the decrease in Postop NOSE score was significant, and no bleeding was observed postoperatively and is thus in accordance with the study. According to study by Ramona Ungureanu [14] the prospective study was performed on 174 patients with chronic hypertrophic rhinitis. All patients underwent CO₂ LASER turbinoplasty. The results showed that the mean value of VAS for “nasal obstruction” parameter decreased from 7.86 before surgery to 4.4 one month after surgery. This study is also in accordance with our study. According to study done by Santosh Uttarkar Panduranga Rao [15], 20 patients were treated with bipolar cautery and he found that With bipolar electrocautery reduction of nasal obstruction was significant and inferior turbinate size in 18 (90%) patients at the third month follow up was grade 1, but postoperative pain was present in 50% of patients. These studies are in accordance with our study which also showed significant decrease in postoperative NOSE Score. Also in our study at 1st week according to VAS Score the postoperative pain was significantly lower in LASER group (0.4±0.52, mean) as compared with the BEC group (0.8±0.42). This difference in the status of pain is statistically significant at 1st week. Also at 2 months, the mean VAS score for pain was more in BEC group (0.4±0.5) as compared to laser group (3.14±1.40) but was statistically insignificant. Endoscopic examination was done in all patients postoperatively at 1st week and at 2 months. On endoscopic evaluation postoperatively, no bleeding was observed in either group. Edema and crusting in the turbinate disappeared in all patients by the end of the first week. In a study done by Sinan Uluyol [16], it was seen that Neither edema nor crust formation persisted for more than 1 week in any patients treated with bipolar electrocautery for hypertrophic inferior turbinate as in our study.

Conclusion
Symptomatic relief was seen is both the groups when compared with NOSE score. Pain was less in patients treated with CO₂ Laser. CO₂ laser is a preferred method for treatment of hypertrophic inferior turbinates.

References


