Volumetric Reduction of the Inferior Turbinate

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Rhinitis represents the inflammation of the mucous membrane inside the nasal cavity. The main causes of the inflammation are viruses, bacteria or allergens. The treatment of this pathology has two stages. The first option is the conservative treatment followed by surgical treatment if the patient does not respond well to medication. In this paper, we will present coblation turbinate reduction method and its benefits.

Keywords: rhinitis, turbinate reduction, coblation

Rhinitis represents the inflammation of the mucous membrane inside the nasal cavity. The main causes of the inflammation are viruses, bacteria or allergens [1].

Rhinitis is categorised into three types: acute and chronic infectious rhinitis, nonallergic rhinitis and allergic rhinitis [2].

We will focus on the treatment methods of chronic rhinitis.

The main symptom of chronic rhinitis is nasal obstruction which in the early stages can alternate from side to side and later becomes continuous and affects both sides of the nasal cavity. The nasal secretions are usually colourless and viscous. Posterior rhinorrhea can lead to compulsive throat clearing. Other symptoms of this disease are secondary pharyngitis, epiphora, secondary dacryocystitis, fatigue, headache and loss of physiological well-being [3, 4].

The etiopathogeny of chronic rhinitis includes dust, chemicals, tobacco smoke, toxins, pregnancy, menstruation, menopause, endocrine disorders, heart and circulation disease, repeated infections or it can be a side effect of drugs. According to the etiopathogeny, chronic rhinitis is classified in occupational rhinitis, drug-induced rhinitis, pregnancy rhinitis, rhinitis associated with physical and chemical factors, food-induced rhinitis, atrophic rhinitis, nonallergic rhinitis eosinophilic syndrome, and vasomotor rhinitis [5].

The diagnosis is based on a thorough history of the patient and clinical ENT examination. In the early stages, the examination reveals tissue hypertrophy that mostly affects the inferior turbinate. The nasal lumen is narrowed, and the mucosa responses to decongestant nose drops. In the later stages, the turbinate mucosa has a granular surface and can gradually develop into nasal polyps [5, 6].

The treatment of this pathology has two stages. The first option is the conservative treatment followed by surgical treatment if the patient does not respond well to medication.

The surgical treatment involves volume reduction of the inferior turbinate and can be performed with LASERS, radiofrequency, coblation, submucosal diathermy or with cold instruments (scissors or shaver) [7].

In this paper, we will present coblation turbinate reduction method and its benefits.

Experimental part

Coblation decreases the molecular bonds of tissue through a non-heat process that leads to ththe e decrease in volume of the tissue. The main advantage of this technology is that surrounding tissue is not heated because the plasma layer takes up most of the heat [8].

Coblation turbinate reduction is a minimally invasive procedure that uses bipolar energy to reduce the size of nasal turbinate. The components of the coblator system are the controller, to which the foot pedal and the wand cable connect. According to the type of wand connected to the controller, default settings for that wand appear on display. The coblation mode can increase from one to nine to adjust the surgeon's needs. Three types of wands are available for coblation turbinate reduction: ReFlex Ultra PTR, ReFlex Ultra 45 and Turbinator. We used the Turbinator Wand. In contrast to the other two types of wands, the Turbinator generates a plasma field through a 2.9 mm shaft, placed at the tip of the wand. Also, on the reverse side of the tip, there are ports for suction and saline irrigation. On the device shaft, there are three depth markers that help the surgeon determine the depth of insertion [9, 10].

Before surgery, the setup of the device is important to avoid intraoperative problems. The saline line needs to be connected to the irrigation pump, the suction tubing to an active suction device and the cable to the controller. The wand has two settings; it can ablate but also coagulate.

Before the surgery, patient preparation is necessary. Coblation can be performed under local or general anaesthesia. The turbinate tissue needs to be infiltrated with a mixture of lidocaine and adrenaline solution [11].

Afterwards, an incision in the anterior part of the inferior turbinate needs to be done, and with the use of a freer elevator, a mucosal pocket is made. The tip of the wand is inserted inside the incision, and then the wand is advanced into the mucosa tracking along the surface of the turbinate bone (fig. 1).

An important fact is that the wand should not be activated during insertion. Once the wand placed at the

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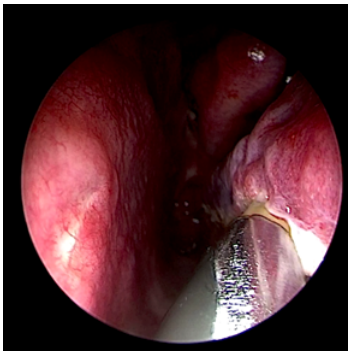

Fig. 1. Chemical ablation of inferior turbinate with minimal thermal damage

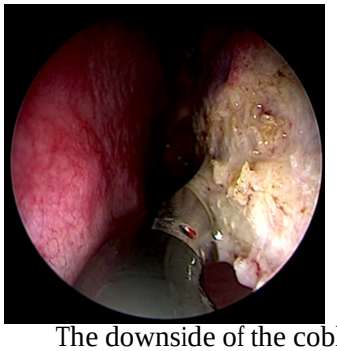

Fig. 2. Intraoperative picture, after turbinate coblation, with no hemorrhage and no damage to surrounding tissue

desired depth, the electrode is oriented towards the targeted tissue and activated by pressing the yellow foot pedal. The Turbinator Wand is slowly retracted through the tissue until the distal depth maker is visible at the surface. After surgery, the recovery is very fast and nasal packing is not needed (fig. 2).

Postoperatively, patients may experience nasal congestion and drainage during the first seven days following the procedure [12-14].

In our clinic, we have used coblation successfully for turbinate reduction for a wide number of patients. This technology proved to be useful, safe and with good outcomes.

In comparison with the classic approach performed with cold instruments, using coblation surgical time decreased due to less bleeding, there were no postoperative complications, the patient's recovery was faster with less pain, no scars and less hospital stay.

Results and discussions

Chronic rhinitis is a very common health problem with symptoms that can affect the patient's quality of life.

Turbinectomy is a procedure that reduces the size of the turbinate and reliefs nasal obstruction and congestion.

Nowadays due to technological advances, new medical devices were created to improve the surgeon's performance and the outcome of the surgery [15-16].

Coblation is a method that uses radiofrequency in a bipolar mode with a conductive solution and energises the ions to form a localised plasma. The effect results in a reduction of the tissue volume. This technology is not a heat-driven process, so it does not burn healthy tissue like other electro and LASER surgery technologies [17]. The radiofrequency does not pass directly through the tissue with coblation, so low temperatures (40 to 70° Celsius) are generated, most of the heat being consumed in the plasma layer by the ionisation process. Coblation turbinate reduction is a minimally invasive procedure that shrinks submucosal tissue preserving the mucosal architecture that leads to no scars and no damage to healthy surrounding tissue. Surgical time is short; it can be performed under both local and general anaesthesia depending on the surgeon and the patient's preferences [18, 19].

Postoperatively there is minimal to none haemorrhage so nasal packing is not necessary. This leads to a bigger comfort for the patient and less hospital stay.

In the early postoperative period, patients accuse significantly less pain compared to the other surgical techniques. The benefits of the surgery are beginning to be perceived by the patients usually after one week when congestion starts to fade [20].

Turbinate coblation is a smoke-free technology which means good visibility during the endoscopic surgeries that increases the surgeon's comfort.

The downside of the coblation technology are the high costs of the single-use wands and the fact that some patients may need to repeat the procedure, especially in patients with allergic rhinitis.

Conclusions

Coblation turbinate reduction is a minimally invasive, safe, reliable method with less pain for the patient, no downtime, no recovery period, better-wound healing, less scarring. This technology increases the comfort for both patients and surgeons. The fact that it can be done under local anaesthesia is very important for the patients with high risks associated that cannot undergo general anaesthesia.

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