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ENDOSCOPIC SELECTIVE POSTERIOR NASAL NEURECTOMY OUR EXPERIENCE AND TECHNIQUE

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ABSTRACT

Hyper reactive nasal symptoms in cases of extreme allergic rhinitis and vasomotor rhinitis are very troublesome for many patients despite best of medical treatment. Surgical techniques for such resistant conditions can be many procedures like selective posterior nasal neurectomy, vidian neurectomy. The technique varies as per the symptoms, available instrumentation, technique, skill, and experience of the surgeon. Other factors include understanding of complex nasal anatomy post operative and intraoperative surgical morbidity, epistaxis, post-operative dryness of nose and eyes, hypoaesthesia of same region, soft palate etc. Endoscopic technique aids in precisely raising mucosal flaps be very selective and fine cutting or transacting the branches of posterior nasal nerves. Accuracy in identification and transaction of the nerves is the key and is mostly devoid of any complications. **Method:** The surgical technique and surgical steps of endoscopic selective posterior nasal neurectomy are discussed. **Results.** The main steps include: intranasal packing with cottonoid or ribbon gauze bilateral sphenopalatine nerve blocks with 2 percent lignocaine 1:200000 adrenaline trans nasal or transoral . Greater palatine foramen blocks are given. Vertical incisions are made behind the posterior fontanelle starting from the posterior aspect of middle turbinate and above the superior aspect of inferior turbinate; and elevation of the mucoperiosteal flap. The sphenopalatine foramen and artery is identified. The posterior nasal nerves which can be multiple are located 4–5 mm inferior to the sphenopalatine artery, and are resected or cauterised. The flaps are repositioned back into place. No post-operative nasal packing is required. The same procedure is performed on the opposite side for effective results. **Conclusion.** This technique provides best results and free from hyper-reactive nasal symptoms in carefully selected cases.

KEYWORDS

INTRODUCTION

Excessive Nasal discharge, sneezing, nasal congestion, and nasal obstruction are frequent symptoms noted amongst patients with allergic and vasomotor rhinitis. Most of these patients respond well to medical treatment. Surgical Indications are only when medical treatment fails or a patient wants a permanent solution understanding the risk and prognosis. In 1961, Golding-Wood[1] in their study first described vidian neurectomy for the treatment of allergic and vasomotor rhinitis. Post-operative complications, such as disturbed lacrimal secretion and numbness of the cheek and gums were noted. In 2007, Kikawada[2] demonstrated endoscopic technique involving resection of the posterior nasal nerve near the sphenopalatine artery. With this technique, intra-operative bleeding can be controlled under direct vision. In 2008, Ikeda et al[3] described submucosal reduction of the inferior turbinate and resection of the posterior nasal nerve. This resulted in significant improvements in nasal symptoms for patients with resistant chronic rhinitis (rhinorrhoea). Ahilaswamy in his study in 2019 described safe and effective endoscopic posterior nasal neurectomy with very less surgical morbidity and complications. Sphenopalatine ganglion gives posterior nasal nerve as branches. It enters the nasal cavity through a separate foramen, 4–5 mm below the sphenopalatine foramen,after bifurcation of the nerve into the lacrimal nerve. The posterior superior nasal nerves innervate the superior and middle turbinates and the superior and middle meatus. Other parasympathetic nerve fibres of the nose branches off and joins the greater palatine nerve and enters the nasal cavity through the canaliculi in the perpendicular plate of the palatine bone as the posterior inferior nasal nerves. These nerves supply the inferior turbinate and the inferior meatus.[4]

Operative procedure

Anaesthesia

1:200000 lignocaine with adrenaline as local infiltration in the region of posterior fontanelle in patient positioned either in local anaesthesia or general anaesthesia as per the pre anaesthesia clearance.

Positioning

The patient is positioned in reverse Trendelenburg position. The head end is elevated to 30 degrees, to decrease venous return. A zero degree 4 mm rigid endoscope with a high-definition camera is used. Pre-medication with injection pentazocine 30mg and inj promethazine is administered intramuscular as per body weight.

Infiltration and nerve block

2 ml lignocaine with adrenaline at a dilution of 1:200000 solution is administered as a sphenopalatine block. The solution is in infliterated in the posterior fontanelle anterior to the crista ethmoidalis adjacent to the posterior aspect of middle turbinate on the lateral wall of nose and anterior to posterior from superior attachment of inferior turbinate.

Needle used is long 26 gauze needle (one and a half inch) bent at 45 degrees. Greater palatine foramen blocks are given after nasal block.

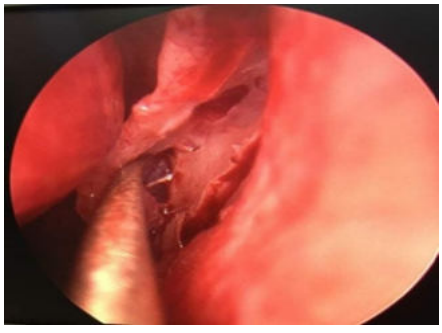

Figure 1 Surgical anatomy of the flap

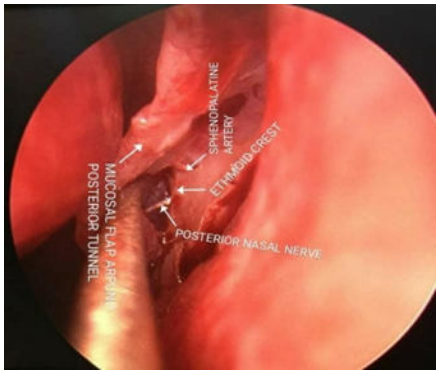

Figure 2 .Surgical markings

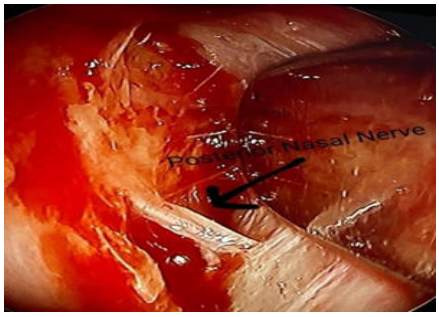

Fig 3 Branches of posterior nasal nerve

Fig 4 post op 1 week epithelized site

Incision

A vertical incision is made (Figure 1) behind the posterior fontanelle. The posterior end of the posterior fontanelle is identified by palpation with a ball probe or freers elevator. Just behind this, a vertical incision is made on the lateral nasal wall using either a flag knife , circular knife or a freers elevator starting opposite to the posterior end of the middle turbinate and running all the way down until it reaches the attachment of the inferior turbinate. The incision ideally should be made with an angled Cottle elevator. However, one could instead use a suction elevator, size 1 nasal canula dragging a small cottonoid between mucosa and bone to prevent bleeding from the incision site, if the procedure is performed under general anaesthesia. Posterior nasal nerves are to be visualized with great precision, they can be more than one. The mucoperiosteum is raised gently using a Cottle elevator or a suction freer elevator, after making the initial incision. Alternatively, if middle meatal antrostomy has been performed, the mucoperiosteum is elevated from the posterior edge of the MMA. Care must be taken not to injure the sphenopalatine vessel during flap elevation. The peripheral part of the posterior nasal nerve can usually be identified just behind the incision, about 4–5 mm inferior to the sphenopalatine artery or crista ethmoidalis (Figure 2). It is always seen that the nerve lies inferior to the vessel. The nerve can have several branches at its exit into the nasal cavity, each through its foramen. The surgeon may miss a branch if the peripheral part of the nerve is targeted instead of the proximal one near the foramen. After identifying the nerve fibres, in our practice is cut using microscissors, sharp cottle elevator or cauterized using monopolar suction cautery (Figure 3) we prefer cutting using microscissors to save mucosal ablation and post op crusting. Same procedure is repeated on the other side for best results.

Closure

The mucoperiosteal flaps are repositioned (Figure 4) usually No nasal packing is required if only neurectomy is done but alongside fess or septoplasty. Merocele packing was done. Patients are discharged on the next day.

ComplicationsIn our series of 50 cases operated between 2020 and 2022, minimal crusting was encountered in 5 cases. We didn't encounter any case of sphenopalatine artery bleeding.

Outcomes The patients were evaluated 1 week before surgery, after surgery, and at 1, 2, 6 and 12 months post-operatively. 22-item Sino-Nasal Outcome Test (SNOT-22) is used for subjective evaluation, each symptom is scored on a scale from 0 to 5 (0=no problem, 1=very mild problem, 2 =mild problem, 3=moderate problem, 4=severe problem and 5=problem as bad as it can be[5]. Statistical analysis data were obtained and entered into a master chart, and assessed using SPSS® version 16 statistical software. The variables were presented as mean±standard deviation (SD). Post- operative improvements in symptom scores were evaluated with the Wilcoxon signed-rank test. A p- value of less than 0.0001 was considered statistically significant. Results During our study period, from April 2020 to september 2022, 50 patients were enrolled. One patients was lost to follow-up and were hence excluded. There were 35 male patients (42.85 percent) and 15 female patients (57.14 percent), with an age range of 18 to 54 years (mean±SD=36.24±7.93 years) (Figure 5)(Figure 6). We conducted a retrospective review of the patient's clinical records. Clinically a lot of symptomatic improvement is seen in almost all operated cases. The subjective nasal symptoms (sneezing, rhinorrhoea, and obstruction) were recorded and scored using the SNOT-22. The SNOT-22 score was calculated by adding the scores of the individual nasal symptoms. The mean symptom scores for sneezing, rhinorrhoea, and nasal obstruction were all significantly decreased at 12 months compared to the pre-operative baseline scores (Figure 7). The SNOT-22 score data were stratified according to symptom severity, with symptoms defined: as mild (scores of 8–20), moderate (scores of more than 20 to 50) or severe (scores of more than 50).[5] The mean SNOT-22 score decreased from 50 preoperatively to 8 at 12 months post-operatively. In addition, 60 per cent of the patients (30 out of 50) had remained almost free of all symptoms, without need of medication at 12 months.

The p-values for these changes were statistically significant (all $p < 0.01$). We also observed a significant improvement in patients' quality of life when assessed at the end of the 12th month post- operatively.

DISCUSSION

Hyper reactive nasal symptoms cases are to be analyzed well and selective resection of the posterior nasal nerve is especially effective for severe rhinorrhoea patients because the interruption of parasympathetic nerve fibers suppresses nasal secretion. Sensory afferent fibers supplying the culprit lateral nasal wall area are transacted. This procedure can reduce sneezing, making it superior to vidian neurectomy.[6] Malcomson showed conclusively that stimulation of the parasympathetic nerve supply or interruption of the sympathetic nerve supply to the nasal mucous membrane causes vasodilatation, hypersecretion and sneezing[7]. Hence, it is quite expected that transacting the same must provide a good relief. Ahilaswamy[8] in his technique documented the effectiveness by a decrease in local secretary mucous glands and basement membrane thickening. Preand post- operative histopathological changes in the nasal mucosa. (H&E; ×4) though the allergy mediator cell eosinophils remained the same, as determined by comparison of pre-operative and postoperative histopathology findings.

CONCLUSION

Endoscopic selective posterior nasal neurectomy is a very useful and easy to perform the procedure; it is less invasive in selected cases highly result giving and can reduce hyper reactive nasal symptoms like sneezing , rhinorrhoea, nasal congestion and nasal blockade .[5] The surgeon can easily do it endoscopically identify ,visualise and transact posterior superior nasal nerve fibres saving and pressing the sphenopalatine artery easily . This makes it a simple ,less time-consuming, cheaper safe,reliable procedure for patients with resistant chronic rhinitis (rhinorrhoea), providing better results than vidian neurectomy.7

Acknowledgement.

We thank all patients who underwent this procedure and attended follow-up appointments which helped us to conclude our research on this procedure.

Competing interests. None declared

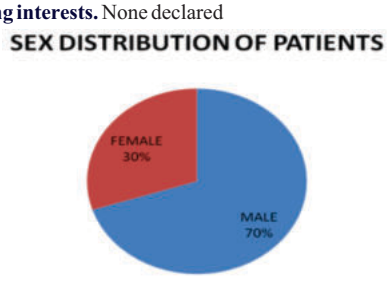

Figure 5 sex distribution of patients

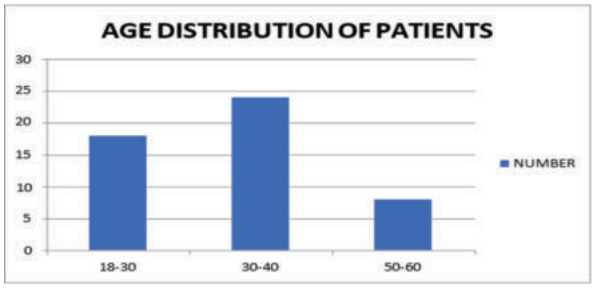

Figure 6 age distribution of patients

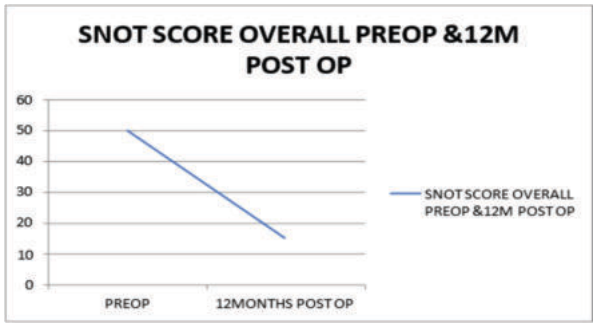

Figure 7: Preoperative and postoperative SNOT score of patients

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