Review Article

Vidian Neurectomy: A narrative review

Abstract

Vidian neurectomy (VN) is a surgical procedure that aims to reduce the symptoms of chronic rhinitis or rhinogenic headache by cutting the vidian nerve, which carries parasympathetic fibers to the nasal mucosa. VN has been used for decades as a last resort for patients who do not respond to conservative treatments and have no contraindications for VN, such as allergic rhinitis, atrophic rhinitis, or anatomical variations. VN can effectively reduce nasal symptoms and improve quality of life, especially when combined with other nasal surgeries. However, the evidence for VN is limited and the long-term effects and safety of VN are uncertain. The most common complications of VN are dry eye and facial numbness, which are usually mild and transient. Clinicians should also participate in multicenter studies and registries to contribute to the evidence base for VN and compare it with other modalities, such as posterior nasal nerve ablation or pharmacological agents.

Keywords: Vidian neurectomy, pterygopalatine fossa, nasal autonomic supply, Nasal obstruction

Introduction

Vidian neurectomy is a procedure that involves resecting or dividing the vidian nerve, thereby disrupting the autonomic nerve supply and improving symptoms, either by endoscopic or open surgical approach [1]. Malcomson observed in 1959 that electrical stimulation of the vidian nerve in cats resulted in sneezing, nasal mucosal swelling, and copious nasal secretion. Vasomotor rhinitis has been believed since the 1950s to be caused by an imbalance in autonomic input, specifically by overstimulating the nasal mucosa's parasympathetic nervous system [2]. To deal with this problem the nerve responsible was approached by a procedure that dates to the 1960s when Golding-Wood approached the vidian nerve using the Caldwell luc's approach in which, while dissecting the pterygopalatine fossa, the vidian foramen was discovered to be situated at the maxillary surface of the sphenoid's medial cranial portion. The vidian neurectomy was performed in the pterygoid canal with the primary goal of resecting the nasal autonomic supply from the parasympathetic nervous system [2]. The effectiveness of this procedure was proven in a study carried out in 1979 in which 28 patients were followed post operatively for resolution and recurrence of symptoms, and, in a total of 9 patients who underwent only vidian neurectomy, 8 patients (88.9%) experienced a complete resolution of

rhinorrhea. Nasal obstruction was relieved completely in (85.8%). As a result of such findings, the vidian nerve proved to be a breakthrough in managing refractory rhinitis [2]. However, soon after its inception, this procedure came under criticism because of the adverse effects that one experiences after undergoing the procedure, namely, xerophthalmia, which is a loss of tear production. Almost 50% of the individuals undergoing vidian neurectomy by methods other than (PNN) approach experienced xerophthalmia [3].The incidence of this adverse effect can be seen in a study carried out in which the senior author conducted 14 procedures on 9 patients, causing eye dryness after 5 procedures. Only one patient required artificial tear therapy for a year, and no serious or enduring complications were found [4]. However, this adverse effect can be avoided altogether by carrying out vidian neurectomy by using the posterior nasal neurectomy (PNN) technique which helps in avoiding the vidian nerve. Posterior nasal neurectomy is a type of highly selective vidian neurectomy that lowers nasal mucosal hypersensitivity and associated secretory activity. Furthermore, PNN decreases the likelihood of long-term dry eyes and palate numbness following permanent vidian neurectomy [5-8]. The transantral subperiosteal approach, the transpalatal approach [9], the transnasal approach through the septum, the transnasal approach through the middle meatus, the microscopic transnasal approach, and the endoscopic transnasal approach are some of the modified approaches that were published by numerous authors during the 1970s and 1980s [2].

All these approaches carried a high risk of complications compared to the endoscopic method that was introduced In 1991 when Kamel and Zaher demonstrated endoscopic transnasal vidian neurectomy in cadaveric models. This approach provided the most direct view to the nerve and reduced the post-surgical complications to a minimum. This approach, however, carried its fair share of adverse side effects [10]. To combat this problem, and to further reduce surgical morbidity, the posterior nasal neurectomy was devised, which is a quick, simple, and efficient option. The fundamental technique involves using a trans nasal approach to carefully cut nerve bundles at the level of the sphenopalatine foramen (SPF). The nasal mucosa can be made immune to allergens and allergic reactions by denervating it.

In a study run from March 2021 to September 2021, 15 patients were signed up. Following surgery, all patients were checked on at the two and six-month marks. Of these patients, 4 were men (26.67%) and 11 were women (73.34%). The patients' average age was 35.2 years. Over the course of six months, the subjective nasal symptoms of all fifteen patients improved. After surgery, the mean TNSS decreased from 12.067 to 8.66 at the end of the second month, a 23.1% improvement. The TNSS consistently decreased by the end of the sixth postoperative month, and it eventually decreased to a mean of 3.4 (a reduction of 70.2%), indicating that the symptoms were getting better over time. Over the last ten years, endoscopic sinus surgery has become more advanced and common [11]. All of this supports the evidence that the most effective method that reduces morbidity and provides long term resolution of symptoms is the endoscopic approach.

This narrative review's main goal is to present a thorough and current synthesis of the state-of-the-art information on vidian neurectomy. The goals cover several important aspects. A Synopsis of the Existing Body of Knowledge: An extensive summary of the body of research on the anatomical, physiological, and clinical aspects of vidian neurectomy will be provided by this review. Assessing Results and Efficacy: An important emphasis will be on evaluating vidian

neurectomy's efficacy in treating different medical conditions through a critical examination of published results, success rates, and clinical trials. Recognizing Research Gaps: The review looks closely at the evidence that is currently available to pinpoint areas that require more investigation. This covers potential gaps in our knowledge, open-ended inquiries, and directions for future research.

Pathophysiology

One category of chronic IgE-mediated (immune) inflammatory disease is allergic rhinitis. The disorder is caused by the infiltration of extrinsic allergens, such as pollen, and intrinsic allergens, such as dust mites, molds, and animal dander, into the nasal cavity's mucosa. This results in the development of two distinct subtypes of allergic rhinitis: seasonal allergic rhinitis and perennial allergic rhinitis [12]. Though it differs from allergic rhinitis in that it is not linked to any antigen, it occurs later in life, has a lower eosinophil response, and affects more women than men, non-allergic rhinitis is like allergic rhinitis [13].

In numerous cohort studies, non-allergic rhinitis has been demonstrated to exist prior to the onset of chronic inflammatory conditions like asthma and chronic rhinosinusitis, despite not being associated with any specific antigen [sIgE]. This supports the type 2 inflammation associated with this condition [14]. Helper T-2 (TH-2) cells infiltrate the nasal mucosa to trigger the reaction known as allergic rhinitis. When exposed to allergens, these cells release IgE immunoglobulins, which in turn cause sneezing, nasal obstruction, mucus discharge, and in severe cases, anosmia [15].

It has been demonstrated that allergic rhinitis patients' sleep patterns are impacted by the condition's symptoms, most notably nasal obstruction. Consequently, this has an impact on how well these people function on a daily basis, which can lead to missed or ineffective workdays and an increase in daytime sleepiness [12].

An imbalance between the parasympathetic and sympathetic nerve supplies is the cause of this allergic reaction, with the parasympathetic nerve supply primarily to blame for increased watery discharge (rhinorrhea) and nasal obstruction (nasal mucosal swelling). The vidian nerve, which supplies the palate and nasal mucosa with parasympathetic nerve fibers, is overstimulated and can result in vasomotor symptoms such as rhinorrhea. In cases of refractory allergic and non-allergic rhinitis, the vidian neurectomy is an important surgical procedure that helps alleviate refractory symptoms. Otherwise, the general management of this condition is medical in the first instance.

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Anatomy and Physiology of Vidian Nerve

The vidian nerve is formed from Parasympathetic fibers from the greater superficial petrosal nerve, which runs along the floor of the middle cranial fossa, and the sympathetic fibers via the deep petrosal nerve from the ICA plexus, and resides within the pterygoid canal, which is a bony canal present on the floor of the sphenoid sinus. This osseous canal provides a connection between the foramen lacerum in the middle cranial fossa and the pterygopalatine fossa [17]. In 80 to 98% of radiographic studies, the vidian canal runs medially to laterally from the pterygopalatine fossa to the foramen lacerum [18].

The union of the deep petrosal nerve from the carotid plexus and the greater petrosal branch of the facial nerve forms the pterygoid (Vidian) nerve. The greater petrosal nerve, which receives a ramus from the tympanic plexus, passes through a groove on the anterior surface of the petrous temporal bone, passes underneath the trigeminal ganglion, and ends at the medial end of the foramen lacerum, which is where the petrous portion of the internal carotid artery is located. It is primarily composed of taste fibers from the palatal mucosa and preganglionic parasympathetic fibers that travel to the pterygopalatine ganglion. The internal carotid sympathetic plexus's deep petrosal nerve joins it here to form the Vidian nerve, also known as the nerve of the pterygoid canal, which travels through the canal before terminating in the pterygopalatine ganglion [19].
To transmit secretomotor impulses to the nose and palatine areas, fibers that emerge from the pterygopalatine ganglion connect with the nasal, nasopalatine, and palatine nerves. Through the deeper petrosal nerve, the blood vessels receive essentially adrenergic innervations, and the glands in these areas receive cholinergic fibers via the greater petrosal nerve. The chorda tympani or greater petrosal nerves are regarded as pretrematic nerves that originate from the facial nerve. The vidian artery, which is a branch of internal carotid artery accompanies the vidian nerve in the canal to reach pterygopalatine fossa [19].
The vidian nerve provides parasympathetic supply to the nasal mucosa, which is brought about by complex interactions at the molecular level. These interactions cause the unpleasant symptoms that one experiences in allergic and non-allergic rhinitis.
A patient needs to be particularly predisposed to becoming immunologically sensitive to common environmental allergens to develop allergic rhinitis. This atopic condition is often inherited and can present as either eczema, rhinitis, or asthma by itself or in combination [20]. Human regulation of lg-E synthesis demonstrates the vital role T cells play in mediating and bolstering suppressor signals to the B cells that produce lg-E. In the healthy individual, suppression outweighs enhancement, and in the atopic individual, helper T cells have a greater impact on lg-E synthesis than suppressor T cells. The current state of knowledge about the system suggests that suppressor factors that may influence the regulation of lg E synthesis may be isolated, even though there isn't a specific treatment to modify the T cell effects in allergic patients. These potent pharmaceuticals cause capillaries in the nose to dilate, secrete more mucus, and draw in eosinophils, basophils, and other cells [20]. This forms the basis of the symptoms one experiences upon exposure to allergens in case of allergic rhinitis and as a prelude to other chronic allergic reactions like asthma in non-allergic rhinitis [14].

Overview of Vidian nerve

The vidian nerve, a branch of the maxillary nerve, synapses in the pterygopalatine ganglion and gives parasympathetic supply to the nasal mucosa, palate, and lacrimal gland. Its selective sectioning, known as vidian neurectomy, has been found to be effective in controlling symptoms of various conditions. Initially, it was popularized as the treatment option for vasomotor rhinitis, however, current literature suggests that it can be used to treat allergic rhinitis, chronic sinusitis with nasal polyps, and chronic cluster headaches. Its common complications include dry eyes and nose as a result of non-selective denervation of the pterygopalatine ganglion (PPG), however, these complications can be reduced by selective sectioning of the efferent nerves coming from the PPG. (21,22)

Indications

Vidian neurectomy is indicated for various conditions such as resistant chronic rhinitis, including allergic and vasomotor rhinitis, and intractable gustatory rhinitis (10). It has been used as a last resort for managing gustatory rhinitis and has shown excellent results in patients with nonallergic rhinitis (15). Additionally, vidian neurectomy is indicated in resistant cases of allergic and vasomotor rhinitis, and it is effective in managing nonallergic rhinitis (20). The procedure involves the functional ablation of the autonomic supply to the nasal mucosa and has been indicated mainly in resistant cases of vasomotor and allergic rhinitis and recurrent polyposis. Studies have also shown that denervation of the nasal mucosa induced by posterior nasal neurectomy suppresses nasal secretion, particularly in allergic rhinitis (21,22). Furthermore, vidian neurectomy has been reported to provide complete relief in a high percentage of patients with intractable cholinergic chronic vasomotor rhinitis (3).

Moreover, Vidian neurectomy has shown promising results in the treatment of various conditions. Different studies found it to be effective in relieving symptoms of vasomotor rhinitis, also noting a reduction in the expression of certain cytokines (13). Another study compared traditional and diode laser-assisted vidian neurectomy for refractory rhinitis, finding the latter to be associated with a better surgical field and lower postoperative bleeding rate. Liu et al reported immediate improvement in chronic cluster headache patients following vidian neurectomy, with no significant adverse events. These studies collectively suggest that vidian neurectomy is a safe and effective treatment option for a range of conditions (14,15).

Anatomical Aspect:

The vidian nerve is formed by union of fibers from the greater petrosal and deep petrosal nerve and passes through the pterygoid canal. On the basis of CT scan the vidian canal can be either completely within the sphenoid sinus (type 1), on the floor of the sinus (type 2), or embedded in the body of the sphenoid sinus (type 3). The length of the vidian canal has been found to range from 13.7mm to 16.2mm. In the majority of patients, the vidian canal is located medial to the

medial pterygoid lamina (78.7-87.9%). Vidian canal can either be embedded or protrude from the sphenoid sinus. A study by Gibelli et al shows that the degree of VN protrusion depends on the degree of pneumatization of sphenoid sinus. Hence assessing the sphenoid sinus volume may help in the selection of surgical approach. (21, 22)

Surgical Approaches

There are numerous descriptions in the literature of approaches to the vidian nerve, including trans-antral via Caldwell-Luc approach, trans-palatal, trans-septal mucoperichondrial, and endonasal route. Malcolmson first used the trans-septal approach for VN in patients with chronic vasomotor rhinitis. It is done under general anesthesia. It involves packing of the pharynx followed by instillation of anesthetic (cocaine) over the sphenopalatine foramen. The septal mucoperichondrium is incised, similar to a submucosal resection and dissected. The dissection is extended along the vomer to the rostrum of the sphenoid and mucoperiosteum is lifted off the sphenoid body. It is then mobilized laterally to the medial pterygoid plate and forward over the perpendicular plate of the palatine bone to expose the posterior rim of the sphenopalatine foramen. The pterygoid canal is identified, and a coagulation current is applied for no more than 5 seconds. The same procedure is then repeated to the opposite side. Post-operative care involves applying glove fingers for 24 hours. The rest of post-operative care is similar to a submucosal resection. This technique has shown to highly alleviate symptoms of rhinitis as well the risk of intraoperative hemorrhage is reduced. However, it is contraindicated in patients with previous submucosal resection where separation of the 2 layers of mucoperichondrium is not possible. (23)

The trans-palatal approach was first performed by Averbukh on cadavers. However, it involved the sacrifice of a large portion of hard palate and inferior turbinate, leading to troublesome bleeding. This approach was later improved by Chandra. Local anesthetic is infiltrated in the junction between the hard and soft palate. A curved transverse incision is made 1 cm anterior to the posterior margin of the hard palate and mucoperiosteum is raised. The remaining soft tissues are cut by diathermy. In order to improve the operative view, the adenoids and horizontal plate of the palatine bone may be removed. A 1 cm long vertical incision is made over the mucoperiosteum in the area facing the vidian canal, followed by mucoperiosteal flap elevation. Chisels are then used to remove the bony part. The vidian canal is exposed and a probe is passed to destroy the vidian nerve. Post-operatively, the patient is kept on a liquid to semi-solid diet for 12 days till wound healing occurs. (24, 25)

The trans-antral approach was described by Golding-Wood in 1970. It involves the opening of the maxillary antrum, followed by the removal of its posterior wall in order to expose the periosteum. The maxillary artery and its branches are identified, and metal clips are applied to the main trunk. The maxillary nerve is then identified and traced to the foramen rotundum, which is the upper border of dissection. The sphenopalatine branch of the maxillary nerve is identified and followed to reach the pterygoid canal. Vidian nerve fibers emerging from the canal are sectioned and a diathermy probe is inserted in the canal to destroy any remaining fibers. (26)

In the Caldwell Luc approach, diseased and scarred mucosa from the maxillary sinus is removed and replaced with new mucosa. CWS is an excellent approach to the vidian canal for vidian neurectomy. (27) Becker et al., in his comparison of maxillary sinus specimens removed during Caldwell Luc procedures and traditional maxillary sinus antrostomies, found that post CWS samples from the antrum were found to have necrotic bone debris, as opposed to the control group, where he found relatively healthy mucosa. (28) So, it should be noted that this surgery should not be preferred, but rather kept as a last resort for when other approaches cannot be considered.

The endoscopic approach is a minimally invasive approach to vidian neurectomy. Nasal endoscopy allows visualization of the sphenopalatine foramen above the middle turbinate. It also allows manipulation of the endoscope in the posterior nasal cavity. By curetting the thinner posterior and inferior margins of the foramen, a wider operative field with minimal bleeding can be achieved. (29) A study conducted to reassess the postoperative long-term results of bilateral endoscopic vidian neurectomy concluded that endoscopic vidian neurectomy is an effective and safe technique in the management of moderate to severe persistent allergic rhinitis.
(30). Initially, the endoscopic approach used was the trans-nasal/retrograde approach. Its steps are mentioned below:

a. The lateral wall of the nasal cavity anterior to the posterior end of the middle turbinate is infiltrated with lignocaine mixed with adrenaline.
b. Posterior to the posterior fontanelle of the maxillary sinus, a U shaped posteriorly based flap is raised over the palatine bone.
c. The surgeon identifies the ethmoidal crest of the palatine bone, and it serves as a useful landmark for sphenopalatine foramen (SPF).
d. Sphenopalatine artery (SPA) is identified and coagulated or clipped with Ligar clips.
e. The mucosal flap is raised behind the foramen into the face of the sphenoid sinus.
f. There is confirmation of the sphenoid sinus with a minimal widening of the sphenoid ostium.
g. The posteroinferior margin of the SPF (the sphenoidal process of the palatine bone) is removed, thereby taking off the medial wall of the pterygopalatine fossa.
h. Contents of the pterygopalatine fossa are pushed laterally to expose the vidian canal.
i. After clear visualization and positive identification of the vidian nerve, 2 to 3 mm of the vidian nerve is removed with a sickle knife or scissors.
j. The mucosal flap is reposited and supported with a small piece of Gel foam. (31, 17)

The retrograde approach was difficult to duplicate and had several drawbacks such as difficulty in identifying the SPN artery as well as morbidity due to cauterization near the pterygopalatine ganglion. The antegrade approach reduces these complications as it does not involve ligation of the SPN artery and there is considerably less operative manipulation of the SPN ganglion. (33, 34, 35)

Efficacy and Outcomes:

The outcomes of vidian neurectomy are generally positive but it can be affected by a few aspects such as the disease for which it was done and the patient's comorbidities. One can postulate its efficacy through comparison to other treatment modalities. According to a study done by Shen L et al, in which they compared efficacy of endoscopic vidian neurectomy with subcutaneous immunotherapy as treatment of allergic rhinitis, the short-term efficacy of bilateral endoscopic vidian neurectomy is greater than subcutaneous immunotherapy for treating house dust mite-sensitive allergic rhinitis. This may be because the surgery reduced the total IgE and specific IgE levels. (36) Another study conducted by Nui X and team reported that patients with chronic rhinosinusitis with nasal polyp benefit most from vidian branch neurectomy with FESS instead of convectional FESS. They also showed data in which superior vidian branch neurectomy is the best approach for patients suffering from allergic rhinitis and asthma simultaneously. (37) Endoscopic posterior nasal neurectomy combined with mini inferior turbinoplasty has shown a significant improvement of 60-80% in nasal allergy symptom scores12. However, there is no gold standard for the surgical management of allergic rhinitis. The mainstay of surgical intervention targets the inferior turbinate and the posterior nasal nerve, which are the sources of parasympathetic stimulation and rhinorrhea in the nose. This combined technique provides consistent, robust results with long-term relief of nasal symptoms due to allergic and vasomotor rhinitis, without additional risk of complication. (38) Prasanna A et al studied the effect of sphenopalatine ganglion (SPG) block for the relief of symptoms in 30 patients with chronic vasomotor rhinitis. Their study showed that the number of blocks required for complete relief was three (range from two to four) at weekly intervals in 66.7% of volunteers. There was no recurrence of symptoms during a follow-up period of 12-20 months in 29 patients, and one patient was symptom free for 8 months. The technique is simple and can be performed as an outpatient procedure without side effects. (39) Another review by Rimmer J et al compared four study groups (231 participants, randomized). No study group was at low risk of bias. The studies compared different types of surgery versus various types and doses of systemic and topical steroids and antibiotics. There were three comparison pairs: (i) endoscopic sinus surgery (ESS) versus systemic steroids (one study, n = 109), (ii) polypectomy versus systemic steroids (two studies, n = 87); (iii) ESS plus topical steroid versus antibiotics plus high-dose topical steroid (one study, n = 35). All participants also received topical steroids but doses and types were the same between the treatment arms of each study, except for the study using antibiotics. In that study, the medical treatment arm had higher doses than the surgical arm. In two of the studies, the authors failed to report the outcomes of interest. Although there were important differences in the types of treatments and comparisons used in these studies, the results were similar. (40) When comparing the approaches of vidian neurectomy alone, the endoscopic approach is most favored. It is the minimally invasive approach to vidian neurectomy. Nasal endoscopy allows visualization of sphenopalatine foramen above the middle turbinate and it also allows manipulation of the endoscope in the posterior nasal cavity. Curretting the thinner posterior and inferior lips of the foramen allows for a wider operative field with minimal bleeding. A study conducted to reassess the postoperative long-term results of bilateral endoscopic vidian neurectomy concluded that endoscopic vidian neurectomy is an effective and safe technique in

the management of moderate to severe persistent allergic rhinitis. (39) The logic behind Caldwell Luc approach is to replace the diseased and scarred mucosa from the maxillary sinus with new mucosa. CWS is an excellent approach to the vidian canal for vidian neurectomy. (27) Becker et al., (28) in his comparison of maxillary sinus specimens removed during Caldwell Luc procedures and traditional maxillary sinus antrostomies found that post CWS samples from the antrum were found to have necrotic bone debris, as opposed to the control group, where he found relatively healthy mucosa. So, it should be noted that this surgery should not be preferred, but rather kept as a last resort when other approaches cannot be considered.

Other Surgical Treatments:

There are several other surgical techniques which can be considered instead of vidian neurectomy. These include a cryosurgical technique, acupuncture, inferior turbinate surgery, botulinum toxin injection, and tribulations. Cryosurgical treatment is not the first-line treatment for the treatment of allergic and non-allergic vasomotor rhinitis, and it does not remove the causes of the disease. However, it may be an effective method of treatment for some patients and a supplement to existing treatment. (43) Acupuncture at Xinwu acupoint combined with loratadine and fluticasone propionate can deliver a powerful efficacy on AR and alleviate the clinical symptoms, without increasing adverse reactions. (44) The inferior turbinate is the initial deposit point for allergens and undergoes dynamic changes through the allergic cascade, which results in nasal obstruction. Targeting the inferior turbinate to augment the nasal airway is the mainstay of surgical treatment in AR. Judicious technique and a mucosal sparing philosophy are necessary to maximize outcomes and improve quality of life. (45) Inferior turbinate reduction is also an option for NAR together with botulinum toxin injections. Nasal obstruction occurring as a result of inferior turbinate hypertrophy in vasomotor rhinitis was historically surgically treated by turbinate resection. However, mucosal and turbinate sparing techniques have now been developed. These include submucosal resection of bone, electrocautery, radiofrequency ablation, coblation, laser ablation, cryotherapy, direct micro-debridement and lateral bone outfracture. A study by Passali et al on comparing various surgical techniques for inferior turbinate reduction showed submucosal resection to have more favorable outcomes in managing symptoms of nasal obstruction and discharge. (13)

Complications:

Several complications like dry eyes, paresthesia of upper lip and palate, post operative infection, palatal fistula, and epistaxis can result from vidian neurectomy. Sometimes, major complications can also arise like 3rd, 4th, and 6th cranial nerve deficits. (32) In order to avoid dry eye, endoscopic posterior nasal neurectomy should be preferred over vidian neurectomy for non-allergic rhinitis patients, as supported by Halderman A et al in their study. (3)

New treatment options:

Over the course of time, several alternative surgical strategies have been employed to replace vidian neurectomy for allergic and vasomotor rhinitis respectively. Endoscopic posterior nasal neurectomy is a novel technique for non-allergic rhinitis and has been shown to reduce xerophthalmia postoperatively, which commonly occurs after VN. This procedure involves selective resection of the posterior nasal nerve (PNN). It can be performed via a trans-turbinate approach, which is usually accompanied by submucosal resection of inferior turbinate. The PNN is isolated and sectioned at the point where it crosses from the sphenopalatine fossa (SPF) to the inferior turbinate. The second approach to PNN is a trans-nasal approach which involves making an incision in middle meatus through which the SPF and PNN are approached. (3)

Nasal obstruction occurring as a result of inferior turbinate hypertrophy in vasomotor rhinitis was historically surgically treated by turbinate resection. However, mucosal and turbinate sparing techniques have now been developed. These include submucosal resection of bone, electrocautery, radiofrequency ablation, coblation, laser ablation, cryotherapy, direct micro-debridement and lateral bone outfracture. A study by Passali et al on comparing various surgical techniques for inferior turbinate reduction showed submucosal resection to have more favorable outcomes in managing symptoms of nasal obstruction and discharge. (13)

Controversies and Challenges

Debates in the Medical Community

The main debate in the medical community about vidian neurectomy is whether it is effective and safe for managing rhinitis. Some studies have reported significant improvement in rhinitis symptoms after vidian neurectomy, especially in patients with non-allergic rhinitis (16). However, other studies have questioned the validity and reliability of these results, citing methodological flaws, lack of long-term follow-up, and potential placebo effects (32).

Another debate is whether vidian neurectomy has any role in treating chronic cluster headache. One study that supports the hypothesis that vidian neurectomy can relieve this headache is ‘Vidian Neurectomy for Management of Chronic Cluster Headache’, which was published in the journal Neurosurgery in 2019. The study reported that vidian neurectomy was an effective treatment method for chronic cluster headache, and that it improved the quality of life of the patients without significant adverse events (41). However, the evidence for the benefit of vidian neurectomy for rhinogenic headache is weak and inconsistent, and more high-quality studies are needed to confirm its efficacy and safety.

Vidian neurectomy is a controversial and rarely performed procedure, and the current consensus is that it should be reserved for selected cases of refractory rhinitis that do not respond to medical treatment (32). More high-quality studies are needed to establish its efficacy, safety, and indications for the above-mentioned conditions.

Limitations of Vidian Neurectomy

The evidence base for the benefit of vidian neurectomy for rhinitis is controversial and weak. Many studies have methodological flaws, such as small sample size, lack of control group, short follow-up period, and subjective outcome measures (42)(46). There is also no consensus on the indications, criteria, and techniques for vidian neurectomy (32).

Vidian neurectomy is associated with some risks and complications, such as dry eyes, infection, bleeding, and damage to nearby structures (32). These complications can be minimized by using endoscopic techniques and careful surgical planning, but they cannot be completely eliminated.

Vidian neurectomy is not suitable for all types of rhinitis. It is mainly indicated for non-allergic rhinitis, which is a heterogeneous condition that can have various causes and mechanisms (32). Vidian neurectomy may not be effective for allergic rhinitis, which is mediated by immunoglobulin E (IgE) and mast cells (42). Moreover, vidian neurectomy may not be feasible in some cases, such as when the vidian canal is embedded within the sphenoid floor, which makes the access more difficult and riskier (22).

Conclusion

Vidian neurectomy (VN) is a surgical option for patients with refractory rhinitis or rhinogenic headache who have not responded to conservative treatments and have no contraindications for VN. VN can effectively reduce nasal symptoms and improve quality of life, especially when combined with other nasal surgeries. However, the evidence for VN is limited and the long-term effects and safety of VN are uncertain. The most common complications of VN are dry eye and facial numbness, which are usually mild and transient. Future studies should use standardized criteria for patient selection, surgical technique, and outcome assessment, and compare VN with other modalities, such as posterior nasal nerve ablation or pharmacological agents.

Implications for Clinical Practice

VN is a surgical option that may benefit patients with refractory rhinitis or rhinogenic headache who have exhausted conservative treatments and have no contraindications for VN. Clinicians should be aware of the indications, techniques, outcomes, and complications of VN, and discuss them with their patients before deciding on VN. Clinicians should also inform their patients about the possible long-term effects and safety issues of VN, and monitor them for any adverse events after VN. Clinicians should follow the standardized criteria for patient selection, surgical technique, and outcome assessment, as recommended by the International Consensus Statement on Allergy and Rhinology. (47) Clinicians should also participate in multicenter studies and registries to contribute to the evidence base for VN and compare it with other modalities, such as posterior nasal nerve ablation or pharmacological agents.

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