Outcome of vidian neurectomy in chronic intractable rhinitis

Leena Balachander
**Introduction**

Rhinitis is the most common symptom with which patients approach physicians. It is distressing for both the patient and the physician, for the former due to its nagging nature and to the later due to inability to cure and problems of self-medications and the complications associated with self-medication in many cases.

Rhinitis is a very common disorder known to all of us. Most of the people suffer from rhinitis at least once in a year. It generally proves to be a self-limiting disease without any treatment. This in contrast to chronic rhinitis affecting up to 20% of people. (1) Rhinitis is inflammation of the lining of the nose characterised by one or more of the following symptoms - nasal congestion, rhinorrhea, sneezing & itching (1). However markers of inflammation are not examined in routine clinical use. Therefore the term rhinitis in daily practice is used for symptoms causing nasal dysfunction.

Rhinitis can be roughly classified into allergic, infectious and non-allergic/non-infectious. The diagnosis of allergy is based on diagnostic tests like skin prick test and or measurement of specific serum Ig E. The disease is non-allergic when allergy has not been proven even after proper allergy examination (2). Rhinitis is called non
infectious when the nasal discharge is clear and watery, non purulant. Detection of micro organisms is generally not used as a diagnostic criteria.

Stimulation of vidian nerve in humans is able to produce structural and ultrastructural changes in glandular, vascular and stromal components of mucosa of nose and paranasal sinuses. These historical changes indicate increase in secretory activity, increase in vasodilatation in deep venous plexus and in vessels around glands and an intense mast cell degranulation around the glands. These intense histological responses are as a result of parasympathetic hyperactivity due to vidian nerve stimulation.

The idea of vidian neurectomy is to disturb this parasympathetic hyperactive response to nasal mucosa by transecting the vidian nerve.

Here we assess the outcome of vidian neurectomy in patients who have chronic rhinitis despite maximal medical treatment. The outcome is assessed with patient’s level of satisfaction with their pre and post operative symptoms.
AIM OF STUDY

1. To evaluate the outcome of vidian neurectomy in patients who have Intractable chronic rhinitis.

2. To find out the response to individual symptom for this procedure

3. To study about the vidian canal type in our study population.

4. To find out the type of approach to each type of vidian canal

5. To find out probable complications arising after this procedure.
Historical Review:

Vidius - in 1509 identified vidian nerve accidentally while dissecting in floor of sphenoid sinus\(^{(3)}\)

Fowler - Observed vasomotor rhinitis following unilateral Stellate ganglion destruction\(^{(3)}\)

Philip Henry golding wood - suggested that chronic vasomotor rhinitis should be considered as simple secretomotor hyperactivity of the nasal cavity mucosa. He also concluded emotional stress played a major role in initiation and progress of vasomotor rhinitis\(^{(4)}\)

1950 - Wolff classified emotional response of target Organs as\(^{(3)}\)

1. Stomach reactors - who respond with gasterointestinal Manifestations following stress.
2. Pulse reactors - change in pulse as a response to stress

Zeilgelmann - In 1934 proposed sectioning of Greater Superficial petrosal nerve as a treatment For vasomotor rhinitis.

Malcomson - In 1957 suggested Vidian nerve has a Predominantly parasympathetic effect and
Sectioning of which improves symptoms of vasomotor rhinitis.

Golding – Wood's transantral approach: (5)

Inspired by the work of Malcomson, Golding wood started to work on the various approaches to vidian nerve. He popularized the transantral vidian neurectomy. He considered it to be a rather safe procedure in comparison to intracranial approach to the nerve popularized by Malcomson.

**Effects of vidian nerve stimulation on nasal mucosa:**

*The parasympathetic innervation of the nasal mucosa play a prominent role in the pathogenesis of chronic hypertrophic non allergic rhinitis*. Golding-Wood 1961 (2)

The vidian nerve provides the main parasympathetic supply to the nasal mucosa and maxillary sinus mucosa. Stimulation of this nerve causes secretory and vasodilatory effects in animals.

Histological changes induced due to stimulation of vidian nerve include:
1. Enhanced secretory activity of nasal mucosal glands
2. Intense vasodilatation of deep venous plexus
3. Increase in the periglandular blood supply
4. Intense degranulation of mast cells

Acetylcholine and VIP have been implicated as the chemical mediators for these response. (2)
Anatomy of vidian nerve:

It is also known as nerve of pterygoid canal. It is formed by post synaptic parasympathetic fibres and pre synaptic sympathetic fibres.\(^{(5)}\)

The following nerves combine together to form the vidian nerve

1. Greater petrosal nerve (preganglionic parasympathetic fibers)
2. Deep petrosal nerve (post ganglionic sympathetic fibers)
3. Ascending sphenoidal branch from otic ganglion

Vidian nerve is formed at the junction of greater petrosal and deep petrosal nerves. This area is located in the cartilagenous substance which fills the foramen lacerum. From this area it passes forward through the pterygoid canal accompanied by artery of pterygoid canal. It is here the ascending branch from the otic ganglion joins this nerve. The vidian nerve exits its bony canal in the pterygopalatine fossa where it joins the pterygopalatine ganglion.\(^{(6)}\)
**Relevant anatomy:**

**Pterygopalatine fossa:**

It is a pyramid shaped space situated posterior to the posterior wall of maxilla.

**Boundaries:**
- Antero laterally – posterior wall of maxilla
- Posteriorly - pterygoid plate
- Medially - palatine bone
- Laterally - communicates with infratemporal fossa

**Contents:**
1. Maxillary nerve
2. Sphenopalatine ganglion
3. Terminal branches of maxillary artery

The pterygopalatine fossa communicates with the choana, the scaphoid fossa, the nasal cavity, the hard palate, the middle cranial fossa and the orbit.

In the posterior wall of this fossa, there are two openings, of interest to us, one of which – foramen rotundum is situated supero – laterally and another which is a funnel shaped opening of the pterygoid canal is situated infero medial to it, being separated by a distinct bony ridge. This opening of the pterygoid canal is situated very close to the medial wall of pterygopalatine fossa. (7)
Sphenopalatine foramen:

Formed between orbital and sphenoidal process of palatine bone and body of sphenoid. The two processes of palatine bone, orbital process anteriorly and sphenoidal process posteriorly forms a V shaped notch in between, which when articulates with body of sphenoid superiorly covering the V shaped notch into a foramen thus forming sphenopalatine foramen.\(^{(7)}\)

Thus the opening of pterygoid canal and the sphenopalatine foramen are situate in the same horizontal plane, with the pterygoid canal in the posterior wall and sphenopalatine foramen in the medial wall of pterygopalatine fossa.

Lateral wall of nose and sphenopalatine foramen:

At the posterior end of bony attachment of middle turbinate, there is a sharp crest of bone called as ethmoidal crest, behind which lies the sphenopalatine foramen transmitting sphenopalatine vessels and nerves from the pterygoid fossa to the nose. The relation between the crest and the foramen is constant, so in order to access the sphenopalatine foramen, we have to elevate a mucoperiosteal flap just anterior to the crest thus exposing sphenopalatine artery before cauterising it.\(^{(7)}\)
**Approaches for vidian nerve:**

Transnasal preganglionic vidian neurectomy:

Position of the patient is same like any of the nasal surgeries and nose is Decongested with lignocaine and adrenaline pack. Incision is made in the lateral nasal wall just anterior to the ethmoidal crest. The incision is a curved one extending from the superior surface of inferior turbinate in the lateral nasal wall extending up to the posterior end of middle turbinate. The ethmoidal crest is identified and removed thus exposing sphenopalatine foramen. Sphenopalatine foramen is widened and a curved probe is passed into the funnel shaped pterygoid canal and the nerve of pterygoid canal is cauterised. \(^{(7)}\)

One major complication in this approach is development of ophthalmoplegia due to the probe sinking deep into the pterygoid canal thus damaging the adjacent abducent nerve. \(^{(7)}\)
**Intrasphenoidal vidian neurectomy:**

The sphenoid ostium is identified in the spheno ethmoidal recess and the same is widened with kerrison’s punch. Vidian canal is identified in floor of the sinus, bony canal wall if thin is removed, exposing the vidian nerve. Vidian nerve is transected and removed under direct vision. (8)

It is mandatory to do a coronal CT–PNS to identify the anatomical variations of vidian canal before commencing the surgery.

**Transpalatal vidian neurectomy:**

This procedure is performed under general anaesthesia, with mouth opened by Boyle Davis mouth gag. A curved incision is made in the hard palate 2 cm anterior to the posterior end of hard palate and the same is extended laterally and posteriorly till the last molar. The incision is deepened up to the underlying bone but not in the lateral aspect in order to avoid injury ro the greater palatine vessels. The mucoperiosteum is elevated until the palatal aponeurosis is visualised. The soft palate is incised from the posterior part of hard palate and nasopharynx is entered. L shaped incision is given with the long limb above the tubal elevation in a postero anterior direction. The short limb of the incision is sited between the posterior and lateral wall of nasopharynx. Elevation of mucosa in this region exposes the medical pterygoid plate till its attachment to the basiocciput. The medial pterygoid is drilled leaving a wedge of bone in its superior aspect taking care not to injure internal carotid artery above foramen lacerum in this region. The pterygoid canal is
visualised as a dense ivory bone in the region of cancellous bone. It is usually 2 – 3mm deep. Vidian nerve is identified in this region and cauterised. Palatal wound closed in layers. (9)

Complications:

1. Palatal fistula can occur if excessive cautery is used in that area
2. Injury to internal carotid artery can occur over foramen lacerum if medical pterygoid drilling is done far more superiorly. (9)

Figure showing incision for trans palatal approach:
Trans septal vidian neurectomy:

SMR is done as usual and the mucoperiosteum in sphenoid ethmoidal recess is elevated further laterally exposing sphenoid osteum and sphenopalatine foramen lower down. Vidian nerve is identified emerging from the canal and it is cauterised. (10)

Figure showing vidian canal in trans septal approach:
Endoscopic posterior nasal neurectomy:

In this procedure superior and posterior nasal nerves are resected as they exit from the sphenopalatine foramen. Procedure is as far same as transnasal vidian neurectomy. Incision is made in the lateral nasal wall starting from the posterior attachment of inferior turbinate inferiorly to the ground lamella superiorly. Mucoperiosteal flap elevated exposing the sphenopalatine foramen. Sphenopalatine artery is identified and cauterised. The postero superior and postero inferior nasal nerves are identified and sectioned. (11)

The main disadvantage of this procedure is even if the symptoms are reduced in immediate post-operative period as in vidian neurectomy, recurrence is more common with in an average period of 2 months. (7)

Endoscopic vidian neurectomy:

Position is same as for any endoscopic surgery. A curved probe is used to palpate lateral nasal wall just behind uncinate to identify the posterior fontanellae. Just behind it hard palatine bone is palpated. A curvilinear incision is made just anterior to the palatine bone. A posterior based muco periosteal flap elevated. The dissection is continued posteriorly exposing anterior face of sphenoid sinus, ethmoid crest and sphenopalatine foramen. the posterior rim of sphenopalatine foramen is widened till the anterior aspect of sphenoid sinus. the anterior wall of sphenoid sinus is penetrated in order to view the floor of sphenoid sinus. The vidian canal lies in between floor of sphenoid sinus and lateral nasal wall. Vidian canal should not be confused with palatovaginal canal
which is present inferomedial to vidian canal and contains terminal branches of maxillary artery and pterygopalatine ganglion. Vidian nerve is identified cauterised and transected. (12)

Vidian canal:

It is a short bony tunnel close to the floor of sphenoid sinus. It transmits vidian nerve and artery from foramen lacerum to pterygopalatine fossa.

Based on the position of vidian canal in floor of sphenoid sinus in CT-PNS, vidian canal is classified into 3 types. (13)

1. Type 1 – vidian nerve is seen entirely in floor of sphenoid sinus where its easily accessible through trans sphenoid route.

2. Type -2 vidian nerve is partially embedded in floor of sphenois sinus.

3. Type -3 vidian nerve is completely buried inside floor of sphenoid sinus.
1. A.E.W. GREGSON ET AL – 1979:

44 patients were included in this study. Rhinorrhoea and nasal obstruction were the dominant symptoms for which vidian neurectomy was done. Of the 44 cases in series, 38 gained complete relief. 3 cases were successful for a period of 8 months and then relapsed. There were 3 patients who did not have satisfactory improvement in their symptoms. 1 patient sustained orbital hematoma. 6 patients developed unilateral maxillary sinusitis. No patients developed kerato conjunctivitis sicca. Some patients had drtness of eyes which subsided in few weeks.


This study was conducted in 222 patients over a period of 18 years for patients who had intractable vasomotor rhinitis. Among these patients, 94% had significant relief of symptoms. His other indications for this procedure were senile nasal drip, chronic epiphora, crocodile tears.

3. P.N. AGARWAL ET AL – 1976

The author performed 125 vidian neurectomies over a period of 3 ½ years. Indications for vidian neurectomy were rhinorrhoea, nasal polyposis, head aches and face aches, Bronchial asthma. Patients who had rhinorrhoea and nasal polyposis got relieved completely (100%). 79.31% of Patients who had head aches and face aches had relieved completely. 55.5% of patients who had
bronchial asthma had decreased episodes of acute symptoms. one patient had occluromotor palsy.

4. AKIOSHI KONNO KIYOSHI TOGOWA – 1979:

They have included 28 patients in their study group, all having perennial rhinitis and they were followed up for a period of 3-7 years. With regard to rhinitis, the symptom stopped almost immediately after surgery in all patients but over a period of 2 years 43% complaints of recurrence. Patients who had nasal obstruction had complete disappearance of symptoms in only 33%. They when further combined with intra nasal surgeries had almost 85% improvement. Thus they concluded that vidian neurectomy when combined with other intra nasal surgeries will alleviate nasal obstruction better.

5. M.V.KIRTHANE, V.S.PRABHU, P.P.KARNIK - 1984:

They proposed a trans nasal approach which was different from the trans antral approach which was widely practised at that time. They cauterised the pre ganglionic fibers of vidian nerve as opposed to cauterisation of post ganglionis para sympathetic fibres in the spheno palatine foramen and not the vidian nerve. they have operated 247 cases in this route with out significant complications.
6. C.M.C.FERRANDES 1988:

They have done vidian neurectomy for 66 patients who had vasomotor rhinitis. Among them, 58 patients were followed up. Among them, 96% had total improvement with regard to nasal obstruction. 87% had improvement in rhinorrhoea and sneezing. 90% had improvement in post nasal drip. So they advocated vidian neurectomy for patients who had intractable vasomotor rhinitis who did not respond to medical therapy.

7. AKIYOSHI KONO ET AL – 2010:

They conducted studies on vidian neurectomized nasal mucosa. It have shown that nasal hypersecretion observed after challenging the nasal mucosa with antigen is caused by reflexively induced activation of the parasympathetic center secondary to stimulation of the sensory nerve terminals in the nasal mucosa by histamine. On the contrary, nasal mucosal swelling is caused mostly by the direct effects of chemical mediators on the nasal vasculature, although vascular reflex mediated by the noncholinergic parasympathetic nerve may be partially involved in the onset of nasal mucosal swelling after antigen challenge.
8. PJ WORMOLD & S R ROBINSON – 2006 :

A total of nine patients with symptoms of vasomotor rhinitis underwent 14 endoscopic vidian neurectomies between 1998 and 2001. All patients had negative screening for allergies on their serum or on skin-prick tests. The outcomes for the patients were retrospectively assessed with patients asked to score their pre- and postoperative symptoms rating these symptoms on a scale of 1-10 after a mean follow-up of 25 months (range, 21-36 months). On this retrospective analysis there was a significant improvement in the symptoms of rhinorrhea (p = 0.018) and nasal obstruction (p = 0.011). There was no significant difference between the pre- to postoperative symptoms for postnasal drip or sneezing. The most common minor adverse effect was dry eyes (35.7%) and nasal crusting (28.6%). They concluded that Endoscopic vidian neurectomy improves the symptoms of nasal obstruction and rhinorrhea in patients with vasomotor rhinitis.


They did vidian neurectomy for 6 patients who had vasomotor rhinitis and one patient with allergic rhinitis. Vidian canal was seen in floor of sphenoid sinus in all patients with CT- PNS. All 14 nerves of the 7 patients were identified in surgery and endoscopic trans sphenoidal vidian neurectomy was successfully done for all patients. They also analysed 1128 vidian canals in CT- PNS and found out that vidian canal protrusion in 529 sides (47%), bilateral protrusion in 189 patients (34%). In the surgeries, none of the middle turbinate was resected, no intra operative complications arise. Improvement of rhinorrhea was seen in almost all patients. Former paroxysms of sneezing was also reduced.
10. Tae Young Jang, MD·Young Hyo Kim, MD·Seung-Ho Shin, MD – 2010:

Six patients with intractable rhinitis who underwent endoscopic transnasal vidian neurectomy were selected. The degree of symptom improvement and complications were assessed through retrospective review of medical records prior to, and 1 year following surgery, and telephone survey after 6.9±2.1 years. Schirmer’s test was performed before surgery, and these values were compared to postoperative results at 1 day, 1 month, and 2 months. Changes in the visual analogue scale were significant in nasal obstruction (8.5±2.5 to 3.0±2.0, *P*<0.05) and rhinorrhea (9.0±2.2 to 2.0±1.6, *P*<0.05). Improvements persisted for up to 7 years after the primary surgery. Patients complained of mild dry eyes for 1 month after vidian neurectomy. However, five out of six reported marked improvement of xerophthalmia after 2 months. Aside from mild crusting of the nasal cavity and mild postoperative pain, there were no major complications. During the entire follow-up period, no patient needed additional treatment, such as antihistamines or corticosteroids. They concluded that, Vidian neurectomy is effective in alleviating nasal symptoms in patients with intractable rhinitis refractory to other treatments. This effect is sustained for at least 7 years with minimal postoperative complications.
Figure showing sphenopalatine artery emerging from sphenopalatine foramen:
The Right Pterygopatine Fossa seen through the Pterygomaxillary Fissure.

The skull is tilted so that the fossa is viewed somewhat from below. The width of the pterygomaxillary fissure is exaggerated so that the openings of the pterygoid canal and foramen rotundum can be seen. The opening of the palatovaginal canal is hidden from view but lies just medial to that of the pterygoid canal.
Picture showing the protruding vidian canal in coronal CT – PNS and the corresponding site during the surgery which shows the vidian canal in floor of the sphenoid sinus, lateral to which, inter sphenoidal septum visualised and further lateral to which internal carotid artery is visualised. The thin vidian canal perforated, vidian nerve hooked around the ball probe and severed using the same instrument.
Type I vidian canal

Type II vidian canal

Type III vidian canal

Prof. PHILIP HENRY GOLDS-WOOD
**Materials and methods:**

The patient population selected for this study had intractable rhinitis, sneezing, nasal itching and/or nasal obstruction for more than 5 years. These patients underwent various medical treatment from anti-histamines to steroids and were recalcitrant with respect to recurrence of symptoms.

**Diagnostic criteria:**

The study population included patients with all or any of the 2 following symptoms,

- watery nasal discharge
- itching of nose
- sneezing
- nasal obstruction

By far the important factor in selection of cases was meticulous history. As suggested by Golding wood, the physical signs of vasomotor rhinitis vary from day to day. Skin testing was done and it was negative for all the patients and in view of Golding wood’s comments on lack of diagnostic value, examination of the nasal secretions for eosinophilia has not been done.

All patients underwent diagnostic nasal endoscopy to rule out co-existent anatomical abnormalities and infection, as well as CT–PNS to identify the type of vidian canal and to rule out the presence of sinusitis.

**Period of study:**

Inclusion criteria:
1. Adult patients (above 18 years) who had 2 or more above mentioned symptoms were offered to participate in this study.
2. Maximum age limit – 60 years
3. To become a candidate for this study, patients should have prolonged medical therapy with unsatisfactory results.

Exclusion criteria:
1. Age < 18 years and > 60 years
2. Associated with other systemic diseases like diabetes, hypertension, ischemic heart disease and other systemic causes for rhinorhea.
3. Patients with associated sinusitis were also excluded from this study.

Experimental design:
Once patients meet the inclusion criteria, vidian neurectomy was done. Transacted nerve segment was confirmed by histo pathological examination in every patient. Patients were followed up for a period of 1 year frequently and feedback was obtained in every visit.

Surgical technique:
Vidian neurectomy was performed by endoscopic trans nasal approach, which was sub categorised as trans meatal / trans sphenoidal depending upon the anatomy of vidian canal in CT- PNS. After procedure, merocel / ivalon was used for nasal packing. All patients had post
operative nasal douching as well as antibiotics for 2 weeks. All patients underwent suction clearance at regular interval.

Follow up:

All patients were followed up for a period of minimum 1 year. Diagnostic nasal endoscopy and if necessary endocleaning was done in all visits.

Sample size:

A sample size of 22 was taken

Outcome:

To assess the outcome for this study, mainly subjective grading systems were used. Thus they were asked to grade their post operative symptoms on a scale of 1 – 4. (14)

Scale 1 – total relief of symptoms
Scale 2 - Marked relief of symptoms with satisfactory results
Scale 3 - Partial relief of symptoms with unsatisfactory results
Scale 4 - No change

Complications that may have arisen has been noted.

Concomitant surgeries performed to access vidian neve was also noted ie, septoplasty and inferior turbinectomy for gaining access to vidian nerve
OBSERVATION AND RESULTS:

22 patients participated in this study.
Patients participated in this study were in the age range of – 19 - 51
The mean age of presentation was – 33.77
Among them, 13 (59.09%) were females and 9 (40.90%) were males.
It was found that:
   21 patients had rhinorrhea (95.45%)

   16 patients had nasal obstruction (72.72 %)

All 22 patients had sneezing (100%)

14 patients had itching sensation in nose (63.63%)

11 patients had all the 4 symptoms (50%)

7 patients had 3 among 4 symptoms (31.81%)

4 patients had 2 among 4 symptoms (18.18%)

5 (22.72%) patients had gross deviated septum for which septoplasty was
   done to Access middle meatus / spheno ethmoidal recess
2 patients (9.09%) underwent turbinectomy for access.

8 (36.36 %) patients had type 3 vidian canal in CT –PNS

8 (36.36 %) patients had type 2 canal

6 (27.27%) patients had type 1 canal

5 patients underwent surgery bilaterally (22.72%) 

17 patients underwent surgery unilaterally (77.27%) 

16 (72.72%) patients underwent vidian neurectomy by transmeatal route

6 (27.27%) patients underwent neurectomy by trans sphenoidal route

The patients were followed up for a period of 1 year and the following results were observed.

Sneezing : 

- 12 patients had scale 1 improvement in their symptoms (54.54%) 

- 9 patients gave feedback that they have symptoms matching scale 2 (40.90%) 

- 1 patient had symptoms suggestive of scale 3 (4.54%)
Nasal obstruction:

- 3 patients (21.42%) had improvement in their symptoms to scale 1
- 5 patients (35.71%) had satisfactory results with their feedback in 2
- 4 patients (28.57%) had unsatisfactory results scale 3
- 2 patients had no change ie, scale 4 (14.28%) in first visit & continued to be the same in subsequent visits.

Rhinorrhoea:

Among the 20 patients who had Rhinorrhoea

- 5 patients (25%) had total relief of symptoms – scale 1
- 13 patients had marked relief with satisfactory results (65%) – scale 2
- 1 patient had unsatisfactory result (5%) – scale 3
- 1 patient had no change in symptom (5%) – scale 4

Itching sensation in nose:

- 11 patients had this symptom
  - Among them, 5 patients gave feedback that they had total relief of symptoms (45.45%) – scale 1
  - 5 patients had improvement to scale 2 (45.45%)
  - 1 patient (9.09%) had no change in symptom (scale 4) in first visit which reduced to scale 3 in subsequent visits.
1 patient developed dry eye which relieved with the use of artificial tear drops.

For 1 patient even though the symptoms reduced in first visit it gradually increased in subsequent visits almost returning to pre-operative status.

<table>
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<tr>
<th>Scale</th>
<th>Obstruction</th>
<th>Sneezing</th>
<th>Rhinorrhoea</th>
<th>Itching</th>
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<td>21.42%</td>
<td>54.54%</td>
<td>25%</td>
<td>45.45%</td>
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<tr>
<td>2</td>
<td>35.71%</td>
<td>40.90%</td>
<td>65%</td>
<td>45.45%</td>
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<tr>
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<td>28.57%</td>
<td>4.54%</td>
<td>5%</td>
<td>0</td>
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<tr>
<td>4</td>
<td>14.28%</td>
<td>0</td>
<td>5%</td>
<td>9.09%</td>
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</table>
Nasal symptoms in study group

approach for vidian canal
Type of vidian canal

- Type 1: 6
- Type 2: 8
- Type 3: 8

Ancillary surgeries needed for accessing vidian canal

- Turbinectomy: 0.00%
- Septoplasty: 25.00%
DISCUSSION:

The efficiency of vidian neurectomy in alleviating symptoms of rhinitis is proved by several workers in the past (Malcomson 1959, Golding – wood 1961, P.J.Wormaold 2006). We practise a trans nasal approach for vidian nerve via the sphenopalatine foramen as described above. This approach has been previously described by many (Patel & Gaikwad 1975, M.V.Kirthane et al 1984, P.J.Wormaold 2006, Lee J.C et al 2009).

The trans palatal, trans antral and trans septal approaches have never gained popularity really, since they are cumbersome and often the exposure to the operative field is minimal.

Although transmaxillary approach is still practised in some parts of the world, it by no means provides easy access. The dissection is made deep into the maxillary sinus, which some times produces brisk bleeding because of the entanglement of vessels (internal maxillary and its branches) and damage to sphenopalatine ganglion and even to maxillary nerve. The most serious and very common complication from this procedure is ophthalmoplegia, so that even Goldind Wood reported incidence of this complication in his study. This arises due to blindly cauterising vidian nerve from sphenopalatine foramen where the probe sinks deep into the pterygoid canal injuring the abducent nerve above. This happens because the direction of the probe corresponds to the direction of the canal in trans maxillary approach, where as in trans nasal approach, it is anatomically impossible for a rigid probe to sink into pterygoid canal. We further almost nullified this complication by widening the sphenopalatine
foramen and directly exposing the vidian canal further posteriorly and transecting it under vision. (7)

Transpalatal approach has its own complications like palatal fistula, numbness to palate and maxillary teeth etc. (9)

In our study, the degree of improvement differed for different symptoms like sneezing, rhinorrhoea, obstruction & itching. Definite results were observed for sneezing, itching and rhinorrhoea but not for nasal obstruction. Difference in effect of vidian neurectomy on rhinorrhoea and obstruction can be explained by difference in the mechanism of onset between these two symptoms. Rhinorrhoea is caused by the reflective stimulation of the glands by afferent and efferent nerve fibres where as obstruction is caused by direct action of chemical mediators on blood vessels (17). Vidian neurectomy is effective by inhibiting excessive efferent stimulation in response to excessive afferent stimulation thus cutting the reflex arc. Thus even if the antigen antibody reaction in nasal mucosa is normal, its effect can be reduced. (15,16)

In our study, in a total of 22 patients, 13 (59.09%) were females and 9 (40.90%) were males. As compared to S.B.Ogale et al 1988, the male & female population were 57.21% and 42.78%.

In our patient population, sneezing was the predominant symptom, all patients (100%) had sneezing. Whereas I P.N.Agarwal et al study, 19 out of 21 patients had sneezing as a predominant symptom ie, 90.47%
In the above mentioned study (P.N. Agarwal et al, sneezing & rhinorrhoea improved significantly (100%) but there was no change in the outcome of nasal obstruction. In our study 57.13% had significant improvement in nasal obstruction, 95.44% had relief from sneezing and 90% had significant improvement in rhinorrhoea.

Anatomical variations of vidian nerve in CT-PNS:

According to the type degree of protrusion of vidian canal in floor of sphenoid sinus, it is classified into 3 types. In Lee et al’s study, among 14 patients, 8 have type 1 canal and 6 had type 2 &3 canal.

<table>
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<th>Symptoms</th>
<th>P.N. Agarwal et al</th>
<th>Current Study</th>
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<td>Total no. of patients</td>
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<td>22</td>
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<tr>
<td>Sneezing</td>
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<tr>
<td>Rhinorrhoea</td>
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<td>21</td>
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<tr>
<td>Obstruction</td>
<td>7</td>
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<table>
<thead>
<tr>
<th>Canal type</th>
<th>Lee et al</th>
<th>Current study</th>
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<tbody>
<tr>
<td>Type 1</td>
<td>8 (57.14%)</td>
<td>6 (27.27%)</td>
</tr>
<tr>
<td>Type 2 &amp; 3</td>
<td>6 (42.85%)</td>
<td>16 (72.73%)</td>
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</tbody>
</table>
Lee et al has done vidian neurectomy by trans sphenoidal approach for all types of canal whereas we did it through trans sphenoidal route for type 1 canals & trans meatal for type 2 & 3 canals.

In shou – chang liu et al’s study, trans sphenoidal approach was done in 42 out of 106 patients (39.62%) 91 patients (85.8%) underwent by trans meatal route.

<table>
<thead>
<tr>
<th>Route</th>
<th>shou – chang liu et al</th>
<th>Current study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans sphenoidal</td>
<td>42 (39.62%)</td>
<td>6(27.27%)</td>
</tr>
<tr>
<td>Trans meatal</td>
<td>91 (85.8%)</td>
<td>16 (72.73%)</td>
</tr>
</tbody>
</table>

Thus pre operative CT scan provide objective data in choosing a surgical approach. (13)

Long term results and complications:

patients responded well initially after the procedure and the results were sustained except for one patient, who initially responded well but after 6 months in third visit complaints of recurring symptoms, but this time it was responding to anti histamines which was not pre operatively. Even for patients patients who had satisfactory outcome, occasional episodes were very much responding to anti histamines.

In our study thus, recurrence was seen for 1 patient (4.54%) . where as in Akioshi konno et al’s study (1979) , recurrence rate was 47%, however in our
study, the mean follow up period was 1.8 years but in their study it was 5.3 years. In Tae yong jang’s study in 2010, recovery of symptoms were consistent for 7 years as of the 1st year.

1 patient (4.54%) reported dryness of eye in initial visit which was gradually improved with artificial tear drops. Whereas in P.J.Wormold’s study in 2006, incidence of dry eye was 35.7%. In Jang TY et al’s study in 2010, incidence of dry eye was 90% which subsequently decreased over a period of 2 months.

Percentage of patients considered cured or with significant improvement after vidian neurectomy according to studies carried out by many authors.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>91.7%</td>
<td>Jin chin lee, Chaun Hiasiang koaun 2011</td>
</tr>
<tr>
<td>93.5%</td>
<td>Tae Young Jang, MD·Young Hyo Kim, MD·Seung-Ho Shin, MD, 2010</td>
</tr>
<tr>
<td>87.2%</td>
<td>Jang TY, Kim YH, Shin SH , 2010</td>
</tr>
<tr>
<td>89.7%</td>
<td>Robinson S.R , Wormold PJ , 2006</td>
</tr>
<tr>
<td>85.8%</td>
<td>Shao-Cheng Liu, MD; Hsing-Won Wang, MD; Wan-Fu Su, MD</td>
</tr>
<tr>
<td>97.6%</td>
<td>P.N.Agarwal et al</td>
</tr>
<tr>
<td>88.7%</td>
<td>C.M.C Fernandes 1988</td>
</tr>
<tr>
<td>86 – 90%</td>
<td>Akioshi konno et al 1979</td>
</tr>
<tr>
<td>94 %</td>
<td>Golding Wood 1973</td>
</tr>
<tr>
<td>94%</td>
<td>M.V.Kirthane et al 1984</td>
</tr>
<tr>
<td>95.4%</td>
<td>Current study</td>
</tr>
</tbody>
</table>
Initially for 5 patients we did vidian neurectomy in both sides which was followed by unilateral vidian neurectomy for other patients. 5 patients underwent surgery bilaterally (22.72%) 17 patients underwent surgery unilaterally (77.27%). There were no difference in response for patients who underwent surgery in one side except for one patient who complaints of unilateral nasal obstruction for one month following surgery which then resolved in subsequent visits.

This results when compared to studies done by Hiranandini 1966 and Golding Wood in 1973 are almost equal. They reported 100% improvement of symptoms in both sides after doing unilateral vidian nerve resection. Where as studies conducted by M.V.Kirthane et al in 1984 showed that out of 41 patients who underwent unilateral vidian neurectomy only 2 reported bilateral relief. ie, 4.87%
Cure rate in percentage:
Conclusion:

1. a. vidian neurectomy is done for intractable chronic rhinitis results in Significant relief from symptoms

b. this relief after surgery is evident almost immediately after surgery ie, with in a period of 1 month

2. patients who had sneezing and rhinorrhoea as a predominant symptom Benefitted more than nasal obstruction.

3. Itching sensation of nose, which was not included in studies conducted by Other authors had also improved to a significant level.

4. complications like dry eye even if arises can be effectively managed by Substituents.

5. Recurrence rate is very minimal, however possibility of recurrence after Several years is not ruled out because the mean period of follow up was Only 1.8 years.
Bibliography:


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18. Bilateral trans nasal vidian neurectomy in management of

19. Experiences with vidian neurectomy A.E.W.Gregson et al
journal of laryngology 1976 p 634 – 78


22. Effects of vidian nerve on mucociliary clearance
M.G.Greenstone , the journal of otology and laryngology , oct 19984 vol 107 894 – 95.


25. Eur Arch Otorhinolaryngol. 2011 Feb 3. [Epub ahead of print]
   Evaluation of the feasibility of the vidian neurectomy using computed tomography.
   Liu SC, Su WF.

   Endoscopic Transnasal Vidian Neurectomy for Intractable Allergic Rhinitis.
   Jang TY, Lee SJ, Kim J, Kim BY.
PROFORMA

Name of the patient : D.O.A : 
Age : D.O.S : 
Sex : D.O.D : 
Ip . no : 

History of presenting illness :

1. sneezing - unilateral / bilateral
   Duration
   Continuous / intermittent
   Aggravating factors
   Relieving factors

2. Nasal obstruction - unilateral / bilateral
   Duration
   Continuous / intermittent
   Aggravating factors
   Relieving factors
3. Sneezing & itching - unilateral / bilateral

Duration
Continuous / intermittent

Aggravating factors
Relieving factors

Past history:

h/ o allergy, asthma, any medical illness, previous surgeries

Examination of nose:

External contour –
Columulla -
Vestibule -
<table>
<thead>
<tr>
<th></th>
<th>Right nasal cavity</th>
<th>Left nasal cavity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal septum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inferior turbinate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inferior meatus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle turbinate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle meatus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roof</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasal mucosa</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Post nasal examination:

- Choana
- ET orifice
- Post nasal discharge

Examination of ear:

Examination of throat:
Diagnostic nasal endoscope:

First pass
Second pass
Third pass

Investigations:

Blood - Hb %
  TC
  DC
  ESR
  Absolute eosinophil count

Nasal smear for cytology
X- Ray PNS
X- ray chest
CT –PNS
Plan: Surgery

Trans nasal endoscopic vidian neurectomy
Trans sphenoidal / trans meatal
Unilateral / bilateral
Other surgeries (septoplasty / turbinectomy)

Follow up:

Any persistent complains
Examination of nose
Diagnostic nasal endoscopy

Prognostic criteria:

Scale – 1
Scale – 2
Scale – 3
Scale – 4

Scale 1 - total relief of symptoms
Scale 2 - Marked relief of symptoms with satisfactory results
Scale 3 - Partial relief of symptoms with unsatisfactory results
Scale 4 - No change

Complications:
Dry eye, ophthalmoplegia, orbital edema

<table>
<thead>
<tr>
<th></th>
<th>1 week</th>
<th>1 month</th>
<th>2 months</th>
<th>6 months</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>complications</td>
<td></td>
<td></td>
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</tbody>
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