Bilateral Vidian neurectomy—indications and results

By P. N. AGARWAL (Meerut, India)

Part I—Indications

The Vidian nerve (the nerve of the pterygoid canal) brings the main parasympathetic secretomotor supply to the glands of the nasal and paranasal sinus mucosa and to the lacrimal gland. The small blood vessels supplying the mucosa of the nose and paranasal sinuses, however, receive autonomic innervation not only from the Vidian nerve but also from the periarterial nerve plexuses of the maxillary and ophthalmic arteries (Ishii, 1970; Ishii and Toriyama, 1972). These findings support the clinical observation that it is the rhinorrhoea rather than the nasal obstruction that is relieved by Vidian neurectomy.

Golding-Wood (1973) reviewing 18 years’ experience of 222 cases of Vidian neurectomy for chronic vasomotor rhinitis found complete relief (except for nasal obstruction) in 95% of patients after a follow up of 5-15 years. His other indications for this operation were senile nasal drip, crocodile tears and chronic epiphora. He says that this operation can succeed in some atopic cases but the results will not be as good as or as well maintained.

Minnis and Morrison (1971) give results in 12 patients after Vidian neurectomy. One patient had gustatory rhinorrhoea after a head injury and the others had classical non-specific chronic vasomotor rhinitis. Symptoms included sneezing, profuse watery rhinorrhoea and varying nasal obstruction. Sinus X-rays generally showed mucosal thickening. Skin tests showed a wide spectrum of non-specific reactions or no reaction. Rhinorrhoea was the main indication for surgery in all instances. All patients improved dramatically. Rhinorrhoea and sneezing were completely alleviated but the normal mucosal reaction to colds was not inhibited. Polypoidal mucosal changes resolved.

The common syndrome of hyperaemia and swelling of the nasal mucous membrane, nasal obstruction, hypersecretion and pain can be produced by a number of factors and has been known as the ‘parasympathetic’ type of response mediated through the Vidian nerves. The nasal pain is often associated with mucosal swelling and may extend to the orbital, supraorbital, zygomatic and temporal regions. Further, hyperaemic nasal mucosa has been demonstrated to have a lowered pain threshold (Slome, 1965).
Irritation of the Vidian nerve as a result of extension of inflammation from the adjacent sphenoid sinus or as a primary condition in the absence of intranasal suppuration, may produce copious rhinorrhoea, profuse lacrimation and conjunctival hyperaemia apart from wide-spread referred pain. This pain is felt over the vertical and occipital regions and is accompanied by pain between and behind the eyes, in the upper jaw and teeth and may extend along the zygoma to the temple. In addition, earache and postaural pain simulating acute mastoiditis, and radiating pain with muscular stiffness in the back of the neck and shoulder may occur (Sluder, 1927).

Bouche et al. (1971) include vasomotor syndromes of the nasal mucosa, recurrent nasosinus polyposis and neurovascular pain as current indications for Vidian neurectomy. Over a 3½ year period, they performed 30 Vidian neurectomies—10 for polyposis, 10 for neurovascular pain and 1 for post-herpetic pain. All 19 patients with polyposis were treated successfully, as were 60% of those with neurovascular pain.

Montgomery et al. (1970) performed unilateral Vidian neurectomy in 10 cases of recurring nasal polyposis. Six were performed without polypectomy and in only one was there a significant reduction of polyposis. In the 4 other cases, the neurectomy was performed along with bilateral intra-nasal polypectomy. In all 4 cases there were no recurrent polyps over a period of 2–5 years on the side of the neurectomy. Polyposis recurred within 1 year in all 4 cases on the contra-lateral side.

Angell-James (1965), while discussing nasal factors in bronchial asthma, mentions the immense role of the autonomic nervous system and the nasopulmonary reflexes in this disease. The most sensitive reception area for the nasopulmonary reflex is called the asthmagenic zone, or trigger area. It is situated on the olfactory region of the nose, spreading down to the lower margin of the middle turbinate and the corresponding area of the septum and over the anterior surface of the sphenoid. The nasopulmonary reflex pathway connects the nose with the bronchial muscles and mucosa.

Experimentally, Brodie and Dixon (1903) were able to cause reflex bronchoconstriction in dogs by electric stimulation of the asthmagenic zone. Stimulation of this area by a variety of different factors may initiate an attack of bronchospastic asthma in the susceptible, but not in the normal human subject.

Krajina et al. (1972) produced experimental vasomotor rhinitis in dogs by extirpating the superior cervical ganglion. Cold air produced sneezing when blown into the denervated nostrils. Stimulation of the sympathectomized nostril caused glottic spasm in one dog. Nasopulmonary and oropulmonary resistance was increased in dogs with unilateral vasomotor rhinitis, the differences being more pronounced with bilateral vasomotor rhinitis (Table I).
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**TABLE I.**

<table>
<thead>
<tr>
<th>Changes in Lower Airway Resistance After Unilateral or Bilateral Superior Cervical Sympathectomy in Dogs</th>
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<tbody>
<tr>
<td>Dog No.</td>
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<tr>
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</tr>
<tr>
<td>Unilateral Vasomotor Rhinitis</td>
</tr>
<tr>
<td>Breathing through mouth</td>
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<tr>
<td>Breathing through nose</td>
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<td></td>
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<tr>
<td>Bilateral Vasomotor Rhinitis</td>
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<tr>
<td>Breathing through mouth</td>
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<td>Breathing through nose</td>
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Besides the mechanical factor, central reflex excitability may be most important in the relation between upper and lower respiratory tracts. Parasympathomimetic reaction of the nasal mucosa, producing more reactivity of the nasal mucosa, also increases the tonus of the tracheobronchial tree, with subsequent increase in pulmonary resistance. Thus, vasomotor rhinitis may produce changes in the lower respiratory tract that resemble bronchial asthma.

The author has performed 125 Vidian neurectomies in 64 patients over the last 13 years. Initially four patients had unilateral operations but, due to incomplete relief in symptoms in all of them, one out of these four subsequently was submitted to operation on the other side. The remaining sixty patients had bilateral simultaneous Vidian neurectomies. All operations were done under general anaesthesia via the bilateral transantral route. After disconnecting the Vidian nerve from the sphenopalatine ganglion, the intra-canalicilar portion of the nerve was destroyed with surgical diathermy. The age incidence in the present series varied from 15 years to 50 years with 39 males and 25 females.

The indications for bilateral Vidian neurectomy in the present series were:

1. Rhinorrhea.
2. Nasal polyposis.
3. Headaches and faceaches.
4. Bronchial asthma.

**Part II—Results**

1. Rhinorrhea

Twenty-four out of a total number of 64 patients (37.5%) presented with profuse-to-incapacitating watery rhinorrhea. In these patients,
there were no complaints of pain in the head and neck or of symptoms of the lower respiratory tract. Three out of 24 patients had partial relief following unilateral operation and have been excluded from Table II.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Results of Vidian Neurectomy</th>
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<tbody>
<tr>
<td>Rhinorrhoea</td>
<td>21 patients</td>
</tr>
<tr>
<td>Associated excessive sneezing</td>
<td>19 out of 21 patients</td>
</tr>
<tr>
<td>Associated nasal obstruction</td>
<td>7 out of 21 patients</td>
</tr>
<tr>
<td>Associated post nasal drip</td>
<td>3 out of 21 patients</td>
</tr>
<tr>
<td>Lacrimation during bout of sneezing</td>
<td>10 out of 21 patients.</td>
</tr>
<tr>
<td>Intermittent infective colds</td>
<td>2 out of 21 patients</td>
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</tbody>
</table>

2. Nasal polyposis

Two out of a total number of 64 patients (3.12%) presented with bilateral multiple ethmoidal polypi along with bouts of sneezing and watery rhinorrhoea. Bilateral Vidian neurectomy along with bilateral intranasal ethmoidectomy produced complete relief in both.

3. Headaches and faceaches

Twenty-nine out of 64 patients (45.32%) presented with varying degrees and combinations of headaches and faceaches. Pain in the head was mostly vertical, bitemporal and/or bifrontal, spreading in some cases to the whole head or to the eye-brows and eyes, occipital, bimastoid and/or infraorbital areas and upper teeth. In addition, aural and periaural pain spreading towards the angle of the mandible was present. Stiffness of the posterior cervical muscles was often present. Associated features included bouts of sneezing, profuse watery rhinorrhoea, varying degrees of nasal obstruction, increased lacrimation and post-nasal drip.

Twenty-three cases out of 29 patients (79.31%) of this group were relieved completely and the remaining 6 (20.69%) were relieved partially. It is interesting to note that in 2 out of 29 cases (6.9%) there was no pre-operative clinical evidence of increased parasympathetic secretomotor activity but both were relieved completely by the operation.

The incidence of infective colds, when present, was not altered in any way.

4. Bronchial asthma

Nine out of 64 patients (14.06%) presented with recurrent bouts of bronchial asthma. Associated presence of dry cough was common and
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only one had productive cough. One patient had increase of asthmatic trouble from March to July every year and in another there was a positive family history of asthma. Associated features included bouts of sneezing and profuse watery rhinorrhea and varying degrees of nasal obstruction.

Five out of 9 cases (55.5%) of this group have been completely relieved, 2 cases (22.2%) considerably relieved while the remaining 2 cases (22.2%) had no relief.

The results perhaps would be more promising if surgery were done in early cases of bronchial asthma, before semipermanent or permanent changes have set in, in the mucosa, muscles and glands of the tracheobronchial tree.

Complications

One patient after unilateral operation had ipsilateral immediate post-operative complete IIIrd cranial nerve paralysis along with ipsilateral hypesthesia of the face and doubtful vesicular (? herpetic) eruptions near the ipsilateral eye-brow. She recovered completely within one year of the operation.

There was one case of unilateral VIth cranial nerve paralysis of immediate post-operative onset after a bilateral operation. There was severe congestion of the eye-ball on the affected side. He too, recovered completely within a year of the operation.

Other complications included paresthesia of the infraorbital areas and upper lip, and a feeling of heaviness of the upper central incisors for a few weeks after operation but these eventually disappeared completely.

Summary

Indications and results of 125 Vidian neurectomies done in 64 patients have been presented. The indications were grouped as: Rhinorrhea (37.5%), Nasal Polyposis (3.12%); Headaches and Faceaches (45.32%); and Bronchial Asthma (14.06%).

Four initial Vidian neurectomies were done unilaterally and produced only partial relief in symptoms.

Bilateral Vidian neurectomy relieved completely all the rhinorrhea cases, all the nasal polyposis cases, 79.3% of headache and faceache cases and 55.5% of bronchial asthma cases.

REFERENCES


P. N. Agarwal

— and TORIYAMA, M., quoted by Kirchner, J. A. and Paparella, M. M. (1973) in the *Year Book of the Ear, Nose & Throat*, Year Book Medical Publishers, Chicago, Page 152.


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