Endoscopic Sphenopalatine Ganglion Block for Pain Relief

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The anaesthetic effect of the sphenopalatine (SPG) block has been well utilized for intranasal topical anaesthesia but the analgesic efficacy of (SPG) block, though well documented in literature, has not been put into practice. The methods available for SPG block till date were blind as they do not visualize the foramen. Nasal endoscopies have been used to visualize the foramen for an effective block. The authors present their experience with the endoscopic sphenopalatine ganglion block for pain relief in head and neck malignancies and neuralgias.

INTRODUCTION

The sphenopalatine ganglion (SPG), the largest group of neurons in the head and neck other than the brain, has been associated clinically and therapeutically with a variety of disorders of the head, facial region and the eye. Surface block of sphenopalatine ganglion either alone or with other neural blockade has shown appreciable levels of success. Though the intra-nasal sphenopalatine ganglion block can be done, up and until now it has been a blind procedure. The present day rhinologists have been regularly using for topical anaesthesia for intra-nasal procedures but not for therapeutic pain relief. The new vistas, so that the rhinologist could visualize the intra-nasal structures which are hitherto hidden.

The aims of the present paper are :

1. To make the Otorhinolaryngologist aware of analgesic efficacy of sphenopalatine ganglion block for pain relief in head and neck neuralgias and malignancies.
2. Use of a nasal endoscope to visualize the

sphenopalatine foramen for an effective block.

RELEVANT ANATOMY

The lateral wall of the nose shows the three turbinates of which the middle turbinate is of interest to us. At posterior end of the body attachment of the middle turbinate, there is a sharp crest called ethmoidal crest immediately behind which lies the sphenopalatine foramen and is oriented at an angle of 15 to 20 degree with sagittal plane (fig.1). This is located (a) just behind or slightly above the attachment of the

Fig.1

The lateral nasal wall showing the sphenopalatine foramen and ganglion

posterior end of the middle turbinate and (b) at the junction of superior and lateral nasal wall, 12 mm above and lateral to the superior border of the choana (Portmann 1982). The superior turbinate acts as a pointer to the sphenopalatine foramen located behind and above the middle

turbinate. A valid landmark is the constant convergence of some of the vessels of the lateral wall towards the sphenopalatine foramen due to the disappearance of vessels in to the foramen. This point is called 'the vanishing point' (Elshazly, 1991).

The sphenopalatine foramen transmits the sphenopalatine vessels and nerves from the pterygopalatine fossa to the nose.

The sphenopalatine ganglion of meckel is situated in the pterygopalatine fossa in the upper part of the pterygo-maxillary fissure lateral to the sphenopalatine foramen. The ganglion is covered by a 1-5 mm layer connective tissue and mucous membrane.

Topically applied local anaesthetic can easily diffuse across the thin layer of tissue into the ganglion (Lefkovitz 1989).

The ganglion has sensory effects through trigeminal and facial nerves, visceral motor function through parasympathetic activity of superficial petrosal nerve and sympathetic function through its connection to the cervical sympathetic chain via the great deep petrosal nerve.

MATERIAL AND METHODS

The present study comprises of 18 patients who attended the multidisciplinary pain clinic of the institution. The clinic is attended, by neurologists. Psychiatrists, Oncologists and Anaesthesiologists to provide comprehensive pain relief management. After a protocol has been established for the trial of Endoscopic sphenopalatine ganglion (SPG) block, the patients are referred to the Endoscopist without revealing the diagnosis. The Endoscopist, then proceeds for the Nasal Endoscopy. A detailed diagnostic nasal endoscopy is carried out to rule out any local abnormality for the condition. One patient, who has been referred for an SPG block, found to be having osteomeatal complex disease and chronic sinusitis. A functional Endoscopic sinus Surgery (FESS) is carried out and she is symptom-

free. Once, it is ascertained that there is no nasal disease, endoscopist proceeds to block as in the technique described below. The procedure is repeated at intervals.

The study included 14 cases of Neuralgias and 4 cases of pain due to malignancy. There are 10 Men against 8 Women. The details of the patients with Neuralgias (Noncancer pain) and response to therapy is shown in Table I and III. Similarly Table II and IV gives details of pain related to malignancy.

TECHNIQUE

Both nasal cavities are sprayed with 4% xylocaine with 1:100,000 Adrenaline. Then the nasal cavity is packed with cottonoids soaked in 4% xylocaine with 1:100,000 Adrenaline, especially between the septum and the middle turbinate. The cottonoids are left in situ for about 10 minutes to achieve maximum anaesthesia and decongestion. The patient assumes a supine posture on the couch with the head the slightly elevated and turned towards the surgeon. 0 and 30 degree hopkins rod nasal endoscopes (Karl storz) are used. A routine diagnostic nasal endoscopy is done to rule out any local nasal pathology. The attention is now concentrated on the postero superior aspect of the middle turbinate and if necessary, the middle turbinate

Fig.2

Schematic representation of nasal endoscope in position for the SPG block

Table I
(For Neuralgic Non Cancer Pain)

Case No.	Sex	Age	Diagnosis	No. of Blocks
1.	F	35	Headache, referred otalgia	2
2.	F	40	Atypical facial neuralgia with otalgia	2
3.	F	58	Post herpetic (Ophthalmic) neuralgia	3
4.	M	60	Atypical facial neuralgia	3
5.	M	60	Post herpetic neuralgia involving v2 division	3
6.	F	37	Epigastric pain	2
7.	F	40	Stress induced psychogenic pain (Bitemporal vague)	1
8.	F	50	Atypical neuralgia of face Recurrence	2
9.	M	86	Post herpetic neuralgia (right v2 division)	4
10.	M	56	Trigeminal (v2)neuralgia	4
11.	M	35	Post traumatic (Head injury) Neuralgia, otalgia (hemifacial)	2
12.	F	35	Atypical facial neuralgia	2
13.	F	35	Otalgia	1
14.	M	18	Atypical facial neuralgia	2

Table II
(For Cancer Pain)

Case No.	Sex	Age	Diagnosis	No. of Blocks
1.	M	60	Bronchogenic carcinoma with atypical headache	2
2.	M	35	Cervical metastasis with Unknown origin (post radiation otalgia)	2
3.	M	60	Ca. oropharynx with otalgia	2
4.	M	35	Ca oropharynx with otalgia	2

Table III
(For Neuralgic Non Cancer Pain)

Case No.	Verbal rating sale		Visual analog scale	
	Before	After	Before	After
1.	2	0	5	0
2.	3	0	7	0
3.	4	0	10	0
4.	3	0	7	0
5.	4	1	10	2
6.	3	3	7	7
7.	3	3	8	8
8.	3	0	6	0
9.	4	0	10	0
10.	3	0	8	0
11.	3	0	8	0
12.	3	0	8	0
13.	3	0	7	0
14.	2	0	5	0

Table IV
(For Cancer Pain)

Case No.	Verbal rating sale		Visual analog scale	
	Before	After	Before	After
1.	3	0	8	0
2.	4	0	10	0
3.	4	0	10	0
4.	4	0	10	0

is fractured laterally to offer a good view of posterior end of the superior turbinate (Fig 2. The sphenopalatine foramen is identified between the posterior end of the middle and superior turbinate (Fig.3).

A high vascularity presenting us a reddish bulge can be seen in diseased states. A probe soaked in 1% xylocaine with 1:100,000 Adrenaline is introduced into the foramen and the endoscope is withdrawn. The probe is left in situ for 5 minute. Alternately a cottonoid with a black thread tag soaked in xylocaine introduced and left tightly between the posterior ends of the turbinate, septum and the choana.

This will facilitate instillation of 1% Xylocaine

Fig.3

Schematic representation of endoscopic views of sphenoidal recess. S : Superior turbinate, M : Middle turbinate, SS : Sphenoidal Sinus

drops (10-15) into the nose at frequent intervals for the next 48 hours. The cottonoid can just be pulled out after 48 hours. The procedure can be repeated at intervals.

RESULTS

The second author of the paper, who is in charge of the pain clinic acted as the evaluator or assessor of pain relief as the endoscopist is not aware of the diagnosis and the efficacy of the technique. Though the assessment pain relief is subjective, two scales are used to measure the relief.

1. Verbal rating scale (VRS) : 0 to 4

0. No pain 1. Mild 2. Moderate 3. Severe

2. Visual Analog scale (VAS) : (0 to 10) is an accepted method for subjective measurement of pain. The patient is asked to tell the evaluator, on a scale of 0 to 10 by using modified abacus

Fig.4

Showing the author proceeding for endoscopic sphenopalatine ganglion block as an office procedure

where "0" denotes no pain and "10" for severe intolerable pain. The abacus is divided into 10 and the patient is asked to denote the level of pain before and after the endoscopic SPG Block.

The subjective pain relief is measured and documented in both the scales. Table III (for neuralgias) and table IV (for cancer pain) shows the pain relief in verbal and visual analog scales before and after SPG blocks. It can be observed that most of the patient had complete relief (15/18) which amounts to 84% success rate. Patient No. 6 with Epigastric pain and No. 7 with psychogenic pain (stress induced) did not get any relief from the procedure. Though post herpetic neuralgia patients fared better, one patient (No.5) showed only partial response. One patient (No.8) had complete response but had recurrence of pain which necessitated two more SPG blocks and was completely relieved of pain. The study has been evaluated by an independent evaluator to rule out inter-observer variability and different from the endoscopist, who is likely to be biased about the success of the technique.

DISCUSSION

The Rhinologist is quite aware of the anaesthetic effect of the ganglion block and effectively uses it for a number of nasal procedures. But the therapeutic or analgesic effect on various head and neck neuralgias or even disorders below the head, such as hyperthyroidism, menstrual pain, spastic colitis, asthma, low back pain, sciatica, angina pectoris, thromboangitis obliterans and arthritis (Lebovitz 1990) is well documented. As can be noticed, the prior research, and clinical reports were published over 45 years ago (Ruskin, 1951). More recently there has been interest in this area of evaluating the analgesic efficacy of sphenopalatine ganglion blocks using different anaesthetic agents. Kitrelle et al (1985) used 4% Xylocaine dripping into the ipsilateral nostril for cluster headaches. Lebovitz et al (1990) used 4% Xylocaine and 0.5 bupivacaine in patients with chronic pain due to arthritis, angina and temporomandibular joint pain. Our interest in this particular field has been aroused

principally to alleviate pain in head and neck malignancies and neuralgias, in close collaboration with the multidisciplinary pain relief and palliative care unit of our institution. It is thought that the effect of the sphenopalatine ganglion is mediated by the autonomic nervous system. (Lefkovitz et al, 1989).

All the techniques available for the sphenopalatine ganglion block are blind. Instillation of local anaesthetic into the sphenothmoidal recess is unsatisfactory, if the mucosa is grossly thickened or if other abnormalities exist. Also it requires the patient to lie with his head upside down which is quite distressing to many patients (Murphy, 1988). Russell (1993) described a technique with nasal probes or applicator for topical anaesthesia of the nasal cavity (Fig. 4). An applicator is inserted at an angle of about 20 degrees to the floor of the nose until the bone is felt at a depth of about 6-7 cms. The end of the applicator should now be close to the sphenopalatine foramen. This is also blind method. Lebovitz (1990) has described a technique where he uses two applicators, one passing through the nares at an angle perpendicular to the plane of the face until it reaches foramen. Abnormal anatomical and pathological variations of intra nasal structures make this blind procedures much more difficult as the sphenothmoidal recess becomes inaccessible. Also, certain intra-nasal variations can present as vague neuralgias (Eg: Cluster Headaches, anterior ethmoidal syndrome) which can be missed if a good intranasal examination is not performed. The fascinating word of nasal endoscopes allows a good intranasal examination. Rigid nasal endoscopy also has the advantage of localization of the foramen, improved visualization with brilliant illumination, enabling an accurate block of the sphenopalatine ganglion.

The rigid nasal endoscopes were introduced for nasal and sinus endoscopy by Hirschman (1901) which was later popularized by Stammberger in Europe and Kennedy in United State. Though the nasal endoscope has been primarily used for the

treatment of paranasal sinus infections (Kennedy, 1985, Stammberger, 1986), they have also been used for other intranasal procedures like management of CSF fistulas (Stankiewicz 1991) and transnasal vidian neurectomy (Kamel & Zaher 1991, El Shazly, 1991).

The endoscopic sphenopalatin ganglion block (Prasanna and Murthy, 1993) is less invasive, relatively safe and well accepted by patients as an outpatient procedure. The added advantages is in advancing the endoscope into the nose and manipulation in the posterior part of the nasal cavity even in the presence of a septal deviation. The inflamed sphenopalatine ganglion can be visualized as a reddish bulge (high vascularity) in diseased states and can be monitored, after the block, regarding the decreased vascularity.

The possible drawbacks of the endoscopic technique are a relatively narrow operative field through the endoscope and altered anatomy because of the out-fracture of resection of the posterior end of the middle turbinate. But a practising nasal endoscopist will find a narrow operative field a disadvantage. The out-fracture or resection of the posterior end of the turbinate to gain access to the sphenoethmoidal recess is not really necessary in all the cases and is not done in any case in the present series.

The pain relief accompanying an endoscopic sphenopalatine ganglion block offers the doctor an opportunity to break into the vicious chronic

pain cycle which is often characterised by hopelessness or helplessness pattern of behaviour. Disrupting the cycle can have a positive uplifting effect on the patient on his/her perception of pain. Additionally the lowered pain levels will reduce the analgesic intake. Hence, the sphenopalatine block appears to be a particularly appropriate pain management alternative for the medically difficult to manage patients. This block is a less invasive procedure than the nerve blocks or the pharmacological interventions and therapy poses less medical risks. It should also be mentioned that mechanism of pain relief by SPG blocks may be strongly mediated by psychological factors. A controlled study of the SPG blocks demonstrated lack of pain relief using normal saline as a placebo due to the lack of numbness (Berger et al, 1986).

This report and its observations must, however be evaluated in the proper perspective. The therapeutic effects of the simultaneous ongoing interventions such as analgesics, psychological counselling and rehabilitation which usually play a significant role in the pain relief were not considered in this paper. Hence a further randomised, prospective and controlled studies with different anaesthetic agents and placebos is mandatory. At the very least, an endoscopic sphenopalatine ganglion block offers a positive pain management experience for the chronic pain patient who is often frustrated and angry about the lack of relief, attention and active intervention.

References

1. Berger, J; Pyles, S. and Saga-Rumley, S.A (1986) : Does topical anaesthesia of the sphenopalatine ganglion with cocaine or lidocaine relieve low back pain. *Anaesthesia. Analgesia*, 65: 700.
2. EL-Shazly, M.A (1991) : Endoscopic surgery of the vidian nerve preliminary report. *Annals of otology, Rhinology*, 100 : 536.
3. Kamel, R. and Zaher, S. (1991) : Endoscopic transnasal vidian Neurectomy. *Laryngoscope*, 101 : 316.
4. Kennedy, D.W. (1965) : Functional endoscopic sinus surgery archives of otolaryngology, 11 : 643.
5. Kitrelle, J.; Grouse, D. and Seybold, M. (1985) : Cluster headache local anaesthetic abortive agents. *Archives of Neurology*, 42 : 496.
6. Lefkowitz, M.; Goldstein, S and Lebovits, A. (1939) : An anesthesiologist's perspective in management of facial, head and neck pain, *philadelphia, W.B. Saunders co.* 324-25.
7. Lebovits, H.A.; Alfred, H. & Lefkowitz, M. (1990) : Sphenopalatine Ganglion block : clinical use in the pain management *clinical journal of pain*, 6 : 131.

8. Murphy, T. M. (1988) : Somatic blockade in clinical anaesthesia in Neural blockade in clinical anaesthesia and management of pain. 2nd Edition, Philadelphia, J. B. Lippincot company. 538-39.
9. Portmann, M.; Gillen, G. and Chabrol (1982) : Electro-coagulation of vidian nerve via the nasal passage. *Laryngoscope*, 92: 453.
10. Prassna, A. and Murthy, P.S.N. (1993) : Sphenopalatine ganglion block and pain of cancer, *journal of pain and symptom management*, 8 : 125.
11. Prasanna A. & Murthy P.S.N. (1993) : Sphenopalatine ganglion blocok under vision using rigid nasal sinuscope, *Regional anaesthesia* 18 : 139.
12. Ruskin S. L. (1951) : Technique of sphenopalatine ganglion therapy. *Eye, Ear, Nose, and throat monthly*, 30 : 28.
13. Russel, A. (1993) : Sphenopalatine ganglion block : A simple block in the management of chronic pain. *American journal of pain management*, 3 : 74.
14. Stammberger, H. (1986) : Endoscopic endonasal surgery, concepts in treatment of recurring Rhinosinusitis. *Otolaryngology & head and neck surgery*, 94 : 143.
14. Stanckiewicz, J. A. (1991) : Cerebrospinal fluid fistula and endoscopic sinus surgery. *Laryngoscope* 101 : 250.

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