

INTRANASAL INJECTION OF ALCOHOL IN THE
TREATMENT OF HYPERESTHETIC RHINITIS
AND SOME OF THE NASAL NEUROSES.*

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In considering the treatment of any disorder one can approach the subject from several angles. In the case of the neuralgias of the head, this approach can be in the form of a direct attack upon the nerves involved, either by injecting them or by a surgical resection. With the vasomotor disturbances of the nose one can approach the subject in a like manner, although it is essential at all times, as it is in neuralgic cases, to give due importance to individual susceptibility or sensitization, causation and differentiation. Knowing the cause and removing it or correcting the patient's susceptibility may be sufficient to relieve him of his trouble. While this may be done in some cases, the difficulties surrounding these methods are much greater than would appear from the many excellent articles that have been published of late years on sensitization and deficient metabolism, and the favorable results are far from what the alluring but grossly misleading advertisements from overzealous manufacturers would have one believe.

It is assumed that a searching survey of the nasal chambers in every instance should precede any radical method of treatment. Therefore, shrinking of the tissues and anesthetization to permit inspection with the Holmes electroscope, plus transillumination or roentgenograms is good practice. A suppurating cell, hyperplastic sinus, a sharp spur, an ulceration, an adhesion, any of these may enter into the etiology of nasal neuroses. It may require a cutaneous test to differentiate them from true "hay fever."

In my first presentation of this subject, which was in a paper read before the American Academy of Ophthalmology and Otolaryngology in 1907, I proposed a method of treating

these disorders by a direct attack upon the intranasal nerves. This work was commenced in 1906, following the suggestion of Schlosser in the treatment of neuralgia and of Killian for anesthetic purpose. I am not aware of this method of treatment having been employed for these neuroses prior to this time, although, as I just said, it was being used for the relief of painful impressions, both local and reflex in character. Since my introduction of this method of treatment I have persistently followed its principles in the greater number of cases of this class. I have also presented several additional papers on the same subject (The Section of Laryngology and Otology, A. M. A., Chicago, June, 1908; Interstate Medical Journal, Vol 17, No. 7, 1910; Reference Hand Book of the Medical Sciences) and have instructed numerous physicians in the technic, and who are using the method right along. Any changes from the original in instrumentation, method of approach, selection of cases, results, complications and the like that may have occurred since this work was first presented I will reserve for discussion until the latter part of my paper.

It is a well recognized fact that the great fifth nerve and its intimate connections with the sympathetic and motor nerve systems plays an important role in a variety of disturbances arising as a result of its stimulation or irritation, whether this takes place from within or from without. The immense area of its peripheral distribution to the mucous membranes of the nose, throat and eyes subjects it readily to untoward influences, such as may act as irritants or excitants that in turn create reflex manifestations that can be grouped into various symptoms complex. It is not necessary to enter into a descriptive recital of the anatomy of the fifth nerve, but sufficient should be said to show how these reflexes may occur. Its sensory root is said to anastomose with all motor nuclei, with the exception of the sixth nerve, coming from the medulla. In addition, the fifth nerve receives sympathetic fibers from both the carotid and cavernous plexus, the latter going to the ophthalmic division and its branches and possess vasomotor function. The sympathetic fibers from the carotid plexus enter into the makeup of the sphenopalatine ganglion (Meckel) as the large deep petrosal nerve. Motor fibers from the facial

nerve also enter into this makeup through the large superficial petrosal nerve. These two petrosals, transmitting motor and vasomotor impulses, as well as sensory and perhaps secretory impulses, unite under the name of the vidian nerve.

The sensory element of this (Meckel) ganglion is derived from two sphenopalatine nerves branching off from the superior maxillary or second root and with that of the nasal nerve derived from the ophthalmic or first root constitute the sensory source of the nasal membranes. As the different fibers leave the ganglionic area for distribution to the membrane lining the nasal chambers and accessory sinuses, they convey all the impulses that go to make up the complexion of the ganglion, namely, sensory, secretomotor, vasodilator, vasoconstrictor and probably trophic. In this way we can account for the tickling and itching sensation in and about the nose, eyes, throat and roof of mouth; the sneezing, the stuffiness, the flow of serum, mucus and lacrimal fluid and the respiratory embarrassment, all the result of stimulation or irritation of these peripheral nerves. I do not think it possible for me to enter into any discussion on the intricate physiologic activities of this ganglionic area because the subject is so complex and so beset with unsolved problems that much is as yet speculative. Just why, after an irritation of these nerves, there should follow in one instance pain, in another reflex asthma, in another rhinorrhea, in another the so-called hay fever syndrome is a physiologic anatomic study that is not within my province at this time, but it nevertheless opens up an immense field for speculation and investigation. One might formulate a law just as Semon did regarding the paralyzing effects of the recurrent laryngeal nerve in which abductor fibers take precedence to the adductors.

For the purpose of simplifying the understanding of this method of treatment, it is usual for me to divide the distribution of the intranasal nerve supply into two main divisions, the anterior and posterior. The anterior division is the nasal nerve, sometimes called ethmoidal. It is one of the three large branches of the ophthalmic root. The other two branches are the frontal and lacrimal. The frontal, being the main branch, terminates as the supraorbital and supplies the upper

eyelid, brow, forehead and temples. The lacrimal supplies the lacrimal gland and the upper lid. The nasal nerve branches off from the ophthalmic root near the sphenoidal fissure. It passes across the upper part of the orbit diagonally forward from the outer to the inner side to pass through the anterior ethmoidal foramen into the ethmoid cells and, after giving a branch to the frontal sinus, it leaves the ethmoid and enters the cranial cavity at the outer border of the cribriform plate; it then passes forward to a slit at the base of the crista galli, which it enters, emerging into the anterior superior angle of the nasal attic chamber about a millimeter or two lateral to the septal articulation. This is the location of election for reaching the nerve intranasally for the purpose of blocking. After it enters the nose a septal and external branch are given off. These branches supply the anterior part of the nasal chamber, also the ala, bridge, tip of nose, brow and forehead. The posterior divisions are branches arising from the sphenopalatine ganglionic area. Through these various branches the posterior nasal chamber and all accessory sinuses, excepting the frontal, are supplied. Filaments are also distributed to orbit, palate, nasopharynx, mesopharynx, eustachian tube, etc.

One of the reasons why certain patients are afforded only partial or no relief from their nasal neurosis after they have had spurs removed, septum straightened, turbinals cauterized and sinuses irrigated is because only a few of the many different nerve filaments have been reached by such procedures. It is well enough to correct such gross irregularities if the symptoms are localized, but where the irritation is of wider distribution then, in addition or separately, the area at the point of nerve entrance into the nose should be blocked. The method of doing this is as follows: For the purpose of injecting the anterior division of the nerve, a straight steel needle of about 22 to 24 gauge and 9 cm. long with a slip joint to securely fit an all glass syringe is used. This fitting has a marker on it indicating the side of the bevel at the other or pointed end. This point should be sharp, but at the same time of short bevel, in order to lessen the possibility of fluid escaping. As the point of the needle is only introduced to a depth of about a mm., the bevel should not be any longer than this. After previously preparing the field for injection

by shrinking and anesthetizing with a solution of cocaine and adrenalin, the straight needle is fixed to the syringe containing the alcohol in such a manner as to show by the indicator on the slip joint that the bevel point is directed forward, and the instrument so prepared is carried to the foramen by following closely the septal wall until the vault is reached, a distance of about 5 to 5½ cm. from the nasal crest; then the point is carried slightly outward as the slit through which the nerve enters is about 1 to 2 mm. lateral to the septum. If properly placed, the point of the needle can be felt entering the opening. No force is necessary. On some occasions I have felt the needle entering the opening for some considerable distance, although this is not necessary or advisable. It is sufficient that the bevel of the point is buried in the foramen so that no fluid escapes into the nostril. The neighboring nostril is injected in like manner. Variations in the depth of the floor of the frontal sinus in only a few rare instances change the location of the foramen sufficiently to warrant more than mentioning. Very high deflections and old fractures offer the greatest obstacle to accuracy. To overcome this I use a very fine and somewhat flexible needle that will pass around the obstruction. The easiest technic is to hug the septum and follow directly beneath the nasal bone. The external branch of the nasal nerve lies in a groove or at times a tunnel in this bone. This branch is of less importance than the inner one, but both are secured at the orifice of the foramen. The distances are slightly altered by age and types of heads. That is to say, in young children a shorter and finer needle should be used. The needle used for injecting the posterior division is 10 cm. long, 16 to 18 gauge, with slip joint and indicator showing the location of the bevel at the point. This point is sharp and of short bevel and bends at about a right angle from its shaft for a distance of about 10 mm. For the very wide nostrils and deeply located fossa a bend of 15 mm. is used, and in like manner one of 7 mm. for closely fitting turbinal and septum. After preliminary cocaineization and thoroughly shrinking of the tissues, carry the curved end of the needle to the posterior nostril, hook it gently around the tip of the middle turbinate, and at a point where this body arises from the lateral wall will be found

the foramen of the sphenomaxillary fossa. Introduction of the needle point into the membrane covering the foramen will reach the nerves emerging therefrom. If the point of the needle is carried three or four millimeters posterior to the first position and then forced laterally through the membrane, a more accurate penetration of the ganglion is possible and with less chance of injuring any vessels. A forward projecting sphenoid or pterygoid process may make this difficult, as Sluder has pointed out.

In injecting the posterior group of nerves, I advise selecting the region of the sphenopalatine foramen as the point of election in which to introduce the curved needle point. It is true that the nerves leaving the sphenomaxillary fossa do not all make their exit at the foramen, only the posterior superior nasal laterals, that supplies the correspondingly named membrane, and the nasopalatine nerve that supplies the vault and septum. The others leave by other exits to enter canals that lead to all the neighboring parts. But one must not lose sight of what the histology of the gland teaches, namely, that many of the sensory fibers from the second root do not even enter into the complex of the gland structure, but pass directly on to the nasal chamber and adnexa. It is to be remembered that the ganglion usually lies directly against or at least very close to the foramen and can be reached, in part at least, by proper placement of the needle point. But aside from this, an injection at the foramen reaches those nerves supplying that part of the nasal membrane where most of the protein substance is likely to be found. Probably it is necessary in some cases, as Sluder has said, that in order to reach the ganglion itself and thereby effect a desensitization of all functional elements contained in the fossa, the straight needle introduced trans middle turbinal posterior tip be used; but in the type of cases under discussion I believe the curved needle is preferable and fully satisfactory. As a matter of fact, my experience has been that only a few of this class of cases require the posterior injection, especially where an accurate anterior injection has been negotiated, and provided the treatment is instituted early. When one is satisfied the needle does not accurately enter the desired place, another attempt should be made in a few days, or where the benefits are only partial

after anterior injection a posterior injection may be added. The relief is usually for the season in hay fever cases. In simple hydorrhea, spasmodic coryza and nasal reflex asthma it usually acts instantly.

Alcohol is a most suitable substance for injection, because it is sterile, nontoxic and noncorrosive. It has been used extensively for the purpose of injecting nerve tissue, and it records no particular untoward results. Its action on nerve substance is a disorganization of its cell elements, causing some hardening but no necrosis. Otto May's investigations on the changes that take place in ganglionic cells and nerve fibers by alcohol (British Medical Journal, Aug., 1912) show the nerve fibers to be much easier affected than the cells. The functional activity of the nerve is restored to normal within a variable period, as is shown by the necessity for re-injecting each season in the seasonal cases. The more exact the injections are made the more effective and lasting are the results. Infiltration of the membrane in the neighborhood of the foramen is far less effective, but one does secure some immunity. Like any similar injection, a careful sterilization of instruments and field and a slow introduction of the fluid is essential to best results. Originally I used absolute alcohol but found this more painful than a 75 per cent dilution with fresh sterile water that I now use. About 10 minims is used for each injection. If the nerve is properly located a sharp pain radiating in the direction of the nerve distribution is immediately experienced on introduction of the fluid. This may last for some time unless anticipated by a previous hypodermic of morphin and atropin. When the procedure is carried out carefully and accurately in otherwise normal individuals there should be no serious or damaging results following. Sometimes a prolonged pain follows the injection, particularly when several areas have been entered or where the alcohol may have entered the cranial cavity and irritated the meninges; but this can be combatted with morphine. Where an infiltration results instead of a block a temporary anosmia may follow the anterior injection. Sluder records one instance of abducens paralysis of temporary duration following his posterior method. Serious bleeding has never occurred with me when the curved needle was used. Most

of the sufferers are nervous with little self control and often restless.

In such patients the nasal membrane during an attack is exquisitely sensitive, so much so that even psychic impressions are sufficient to excite vasomotor and secretory activity. For this reason it is best to administer morphin and atropin prior to the treatment and a tablet containing a small dose of codein and caffen at intervals of a few hours following.