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SURGERY OF THE FIFTH NERVE. ✓

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SURGERY OF THE FIFTH NERVE.

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The Greek mythology portrays the sufferings of Tantalus in the lower regions, but neither the thirst of the ancient hero, nor the fear of the suspended rock can be compared with the suffering and despair experienced by the victim of tic douloureux. He is a sufferer serving a life-sentence, from which death alone can liberate.

In the time allotted me in which to discuss this important subject no general considerations of trigeminal neuralgia can be expected. Only the briefest possible considerations will be given to the extra-cranial operations, for rarely indeed do patients consult us until they have run the gauntlet of minor surgical procedures. The supra-orbital, infra-orbital, and inferior dental, one or all, has been severed, and the pain has recurred. A patient once having obtained relief will invariably return for surgical aid when the pain recurs.

Our experience with neurectomy of the trifacial nerves, when made peripherally, is gratifying as a temporary expedient. The length of the immunity from pain in my experience has been very variable. Sometimes only two or three months of complete relief follow, again as many years. The pain very surely returns and relief is again demanded.

What to do next is much more of a problem. Shall it be another attempt at the same location, in the delusion that the nerve has united? Such a course will be futile. We must plan an attack upon the nerves much closer to the brain.

Supra-orbital neuralgias have been, in my experience, more lastingly benefited by neurectomy than neuralgias of the infra-orbital nerves. In infra-orbital neuralgias the relief afforded by neurectomy at the exit or along the course of the infra-orbital canal, is very transitory. This is accounted for by the fact that the orbital and the post-superior dental branches are given off before the nerve enters the infra-orbital canal. Therefore, when the condition is severe, as when it recurs after infra-orbital neurectomy, the trunk of the second division together with Meckel's ganglion, must be excised, or the nerve must be severed between this ganglion and the brain. The inferior dental nerve is easily reached in the ramus of the jaw.

I have usually trephined the jaw-bone midway between the angle and the last molar tooth through an external incision. This operation is simple and more lasting in its results than neurectomy of the second branch, but as has been said, pain recurs and we must then resort to more radical measures.

The major operations for the relief of tic douloureux rank among the most delicate known. They require very accurate anatomical knowledge and manual dexterity.

As pioneers in this field of surgery should be mentioned the names of Professors Rose, Hartley, Krause, and Horsley, who have devised operations for the removal of the Gasserian ganglion.

The excision of the Gasserian ganglion is, however, at best a serious, and often a mutilating operation and is accompanied by a high mortality.

In Turk's tabulation of 201 cases, 83 per cent. survived the operation, and 77.6 per cent. could be counted upon as permanently cured. Thirty-three cases died, 17 immediately following operation. Eleven did not regain consciousness, and the remainder succumbed to meningitis, brain tumors, abscess, pneumonia, softening of the brain, hemorrhage, and uremic coma.

The removal of the Gasserian ganglion necessitates severe compression of the brain by retractors. This may injure the structure of the anterior lobes of the brain, and the evulsion of the ganglion is frequently accompanied by severe shock. The nerve supply may be so severely injured that loss of vision results.

In view of the severity of the Gasserian ganglion operation and its sequelæ, and the inefficiency of the extra-cranial procedures, let us consider whether there is not some middle ground, some operation which, while not as hazardous as the former, will show equally lasting results. Fortunately we have in the Abbe operation exactly what is demanded, an operation relatively safe, and as far as the writer is cognizant, capable of affording permanent relief.

In the reports of two Abbe operations which are appended I have gone sufficiently into the technique of procedure, so that it will be unnecessary to consider the matter here in detail.

Dr. Robert Abbe of New York City has described his operation very minutely. There are, however, a few points which may perhaps be discussed with propriety.

Gutta-Percha Tissue.—Dr. Abbe recommends the introduction of gutta-percha tissue between the severed ends of the nerve. In this one respect I deviated from his technique. My reason for so doing was fear of the unknown properties of gutta-percha tissue; i. e., the length of time it is capable of retaining its integrity in the tissues, and the still greater fear of introducing a substance which could not be sterilized by heat. Gutta-percha tissue cannot be boiled nor can it be subjected to intense dry heat. We must rely upon chemical disinfectants such as a corrosive sublimate and formaline solutions.

I made use of the gold leaf in one case, after pushing the distal severed ends of the nerves downward through the foramina by rolling the gold leaf into a ball considerably larger than the diameter of the foramen and crowding it forcibly into the canals.

In my second case a piece of moderately thick gold leaf was laid over the foramen. In both cases the gold leaf was held in sterile forceps over an alcohol flame until red hot. No method of sterilization can be more positive than this.

Paralysis.—In nearly all the intracranial operations which are made for the relief of tic douloureux a paralysis, either transitory or permanent, occurs. Usually the upper division of the facial nerve which takes an upward course after leaving the parotid gland and overlies the temporal fossa is severed, resulting in a paralysis of the occipito-frontalis and orbicularis palpebrarum.

The deformity resulting consists in a sagging of the brow and absence of frontal wrinkles. I have observed this deformity to be so severe that the patient could with difficulty see out from under the overhanging brow. If the temporal branch of the facial nerve can be preserved these permanent deformities will not occur. It is fortunately possible to avoid this branch in the Abbe operation by making the vertical incision just over the condyle of the jaw. The zygoma can be reached and cleared by the aid of a periosteal dissector and a portion of it excised and the fibers of the temporal branch separated until the temporal fossa is reached.

The skin incision is safe to the lower border of the projecting condyle of the jaw or to a line with the external auditory meatus. If carried lower than this the temporo-facial branch will surely be severed. Again, if the incision is made anterior to the condyle of the jaw, midway between the outer angle of the eye and the external auditory meatus, the upper branches of this nerve will be severed. It is true that this skin incision is located too far posteriorly, but after separating the fibers of the temporal muscle retraction will expose as large an area of bone as necessity requires. A paralysis may follow too vigorous retraction in this region but it will be of short duration.

The skin incision should commence on a line with the external auditory meatus and three-quarters of an inch anterior to it, carried slightly forward and upward about two and one-half inches. When the zygoma is reached it should be subperiosteally resected or as nearly so as a bone can which affords muscular attachments.

Trephining the Skull.—After subperiosteally resecting the zygoma and separating the fibers of the temporal muscles the trephine is applied to the squamous portion of the temporal bone on a level with the upper border of the zygoma. A hole about three-quarters of an inch in diameter is made and this is enlarged with bone-cutting forceps. The dura is gently elevated from the bone.

Plate I shows opening in the skull.

Hemorrhage is first encountered during this step in the operation and may be quite free from branches of the middle meningeal artery. Small strips of gauze should be packed into the wound and pressure exerted, especial attention being directed to filling in the osseous grooves in which the middle meningeal branches course. After from three to five minutes these vessels will cease to bleed. Far more troublesome hemorrhage, however, occurs as the dura is progressively separated from the skull in quest of the foramina through which the second and third branches pass. The bleeding is now venous and rather troublesome, as it quickly fills in the deep wound and obscures the field of operation. Gauze packing may now be tamponed into the wound and allowed to remain about three minutes, when it may be removed and more progress made. Unfortunately when the gauze is withdrawn bleeding is liable

to recur. I have used with far greater efficiency gutta-percha tissue, about which blood coagulates readily and when the tissue is removed quite firm clots adhere to the bleeding points. If hemorrhage proves so troublesome that no progress can be made a packing may be left in the wound for twenty-four hours, when the operation may be resumed.

Mr. E. W. M., American, aged fifty-two, entered the Massachusetts Homeopathic Hospital about the middle of October, 1905, and was under close observation for two weeks



Plate I.

prior to operation. His symptoms commenced seven years ago, at first noticed only while chewing, but gradually grew worse. They soon became spasmodic. Paroxysms of pain lasted about three minutes, then intervals of three minutes, provoked by chewing, talking, or draughts of air. He gradually grew worse and in 1899 Dr. Maurice Richardson of Boston operated upon him. He resected the second branch of the fifth nerve within the sphenomaxillary fissure, external to the orbit, by removing a button from the sphenoid bone. At the same time the third branch was severed external to the skull at its exit from the foramen ovale. Then followed a period of two and a half years during which time Mr. M. received great relief. A year ago, the pain having recurred, he entered the Massachusetts Homeopathic Hospital and Dr. N. W. Emerson resected the infra-orbital branch at its exit from the infra-orbital foramen. This helped him slightly for about a month.

About the middle of October, as above stated, he appeared

for readmission. His condition was indeed pitiable and he was desperate, declaring that he would endure his suffering no longer. The dangers of the operation did not in the least deter him; he preferred death to his present state. Severe paroxysms of pain accompanied by violent twitching of the facial muscles occurred whenever he moved his face. The taking of food was so painful that he would go forty-eight hours without tasting it. The second branch gave him the greatest concern, but the first and third participated to a considerable degree.

On October 25, 1905, the Abbe operation was undertaken and successfully carried out. A vertical incision was made. The zygoma was resected, the attachments of the masseter muscle were partially severed, the fibers of the temporal nerves were separated. A trephine was applied to the squamous portion of the temporal bone and an opening made which was enlarged by bone-cutting forceps. The dura was then separated from the base of the skull and all bleeding checked by gauze packing. The foramen rotundum was clearly demonstrated and the second branch of the trifacial was severed as it entered the foramen. The dura was lifted still more posteriorly and the third branch was clearly seen as it entered the foramen ovale. It was cut close to the dura. Both distal ends of the nerve were carefully pushed downward through the foramina and the canals were plugged with sterile gold leaf to prevent reunion. Drainage was left between the dura and the skull, the severed muscles approximated and the external wound closed, except where drainage was established. On awaking from the anesthesia the patient was free from pain. In twenty-four hours the drainage was removed. The wound healed kindly by first intention and the patient made an uninterrupted recovery. He was discharged from the hospital on November 17, 1905, twenty-three days after the operation.

Under date of March 26, 1906, he writes as follows: "I went to work in a jewelry factory (a week after leaving the hospital), and have worked from ten to twelve hours per day since. Do not have any pain in my face and am enjoying the best of health."

Plate II shows a moderate degree of paralysis of the occipitofrontalis.

Case 2.—Mr. A. J. P., American, aged sixty-nine, entered the Massachusetts Homeopathic Hospital early in November, 1905, for tic douloureux. He gave the following history:

Has been suffering from trifacial neuralgia for several years. Thinking that his teeth were at fault he has had all of the molars of the left side extracted, but without relief. Early in the year 1905 he entered the hospital and was treated medically. Feeling that he had somewhat improved he went home for a

time, but in April returned and a resection of the supra-orbital and infra-orbital nerves was made.

This operation resulted in a very marked improvement which lasted four months. For over two months he has been suffering from recurrence of the same twitching and spasmodic pain in the supra- and infra-orbital regions.

This patient has reached advanced life, being sixty-nine years of age. He had a valvular lesion of the heart and was passing

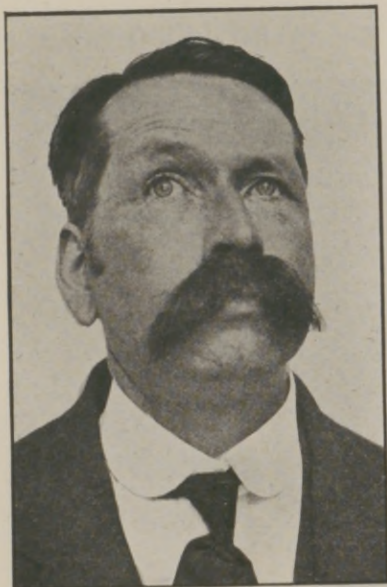


Plate II.

only half the usual amount of urine, which contained albumin with hyaline and granular casts.

The danger of the operation was explained to him but nothing could deter him from attempting the only source of relief afforded. He was operated upon on November 11, 1905, by the Abbe method. The incision was made as previously described. The zygoma was resected and the trephine was applied to the squamous portion of the temporal bone. The dura was elevated. Considerable bleeding was encountered but packing stopped it sufficiently so that progress could be made. The second branch of the fifth nerve was seen just before it entered the foramen rotundum. Here it was grasped with a tenaculum and severed with the scissors. The distal end of the nerve was pushed through the foramen and the canal was overlaid with gold leaf. The bleeding in this case was very annoying and the operation prolonged. The chloroform nar-

cosis, the severe and prolonged pressure upon the brain by retraction and packing, together with the age and general debility of the patient, proved almost more than he could stand, for he stopped breathing and was resuscitated with difficulty. In view of this and taking into consideration the fact that the inferior maxillary branch had never occasioned trouble, it was thought unwise to prolong the operation in order to resect this nerve. The wound was therefore closed except at the angle where drainage protruded. Pain ceased with the operation, drainage was removed in twenty-four hours, patient sat up on third day, and left the hospital within two weeks.

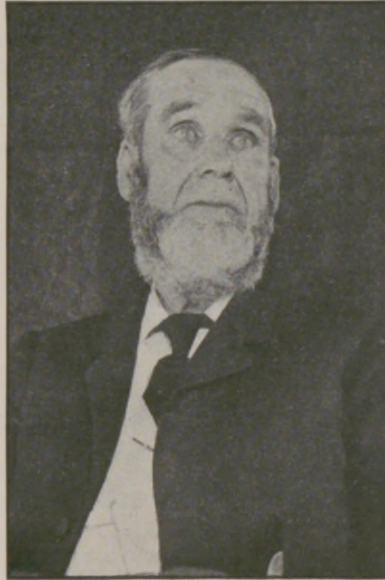


Plate III.

On March 23, 1906, he writes as follows: "I will say that I have not had any pain in my face since you operated upon me. That side of my face is numb but that is nothing compared with the pain."

On August 22, 1906, Mr. P. called upon me. There is still numbness on the side of the face, corresponding to the distribution of the second branch. The slight temporary paralysis of the occipito-frontalis has entirely disappeared as will be seen by the accompanying photograph, and scarcely a perceptible scar remains from the operation. The result appears entirely satisfactory.

Plate III shows patient about one year after operation with no paralysis of the muscles of face.

