AN EVALUATION OF PALLIATIVE SURGICAL PROCEDURES IN TRIGEMINAL NEURALGIA

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(Received for publication March 27, 1952)

It is generally understood that sensory root section by the temporal route is the operative procedure to give lasting relief from the pain of trigeminal neuralgia. Some writers, however, agree that there are indications for less radical or palliative procedures which must be considered in many instances. It is our purpose in this paper to give further consideration to the palliative procedures that are commonly employed: alcohol injection of branches of the trigeminal nerve; or avulsion of peripheral branches of the trigeminal nerve.

It is felt that standard text and reference books are negligent in not giving more discussion of the usefulness of palliative operative procedures, especially avulsions, for the relief of major trigeminal neuralgia. Some textbooks make no mention of the palliative procedures; others refer briefly to the use of a palliative procedure but discuss only alcohol injection. The popularity of alcohol injection is shown in the statement of Dandy: "Injections of alcohol have now almost superseded neurectomies. By either method the relief is only temporary, rarely being longer than 18 months and usually much less." In the same reference work Peet stated: "Avulsion or section of the peripheral nerves is never indicated, with the possible exception of the supra-orbital, since alcohol injection gives relief of equal duration and leaves no disfiguring scar." Grant stated that he does not believe in avulsion of any of the peripheral branches of the 5th nerve other than the supra-orbital, since, in his opinion, injection of the 2nd and 3rd divisions produces a greater area of anesthesia. He does point out, however, that 4 or 5 years of relief may be obtained by supra-orbital avulsion.

Perhaps the foremost indication for a palliative procedure is an aged patient in a debilitated state in whom a craniotomy would be hazardous. A second indication for a palliative procedure is neuralgia confined to the 1st division of the trigeminal nerve, or pain from involvement of only the 1st and 2nd divisions of the trigeminal nerve. One hesitates particularly to produce a corneal anesthesia in the original operative procedure. It is not uncommon to hear the complaint of a patient that had he known what he was to experience in the way of facial anesthesia he would not have submitted to the surgery. This complaint is less apt to occur if a palliative procedure is first employed and followed by the permanent procedure when the pain recurs. Perhaps even more disturbing to the patient are the dyesthesias that occasionally occur. We have had patients with typical major trigeminal neuralgia due to multiple sclerosis. In such patients, a palliative
procedure, rather than a permanent division of the fibers of the 5th nerve, is indicated. Occasionally it is difficult or impossible to be certain whether a patient has one of the atypical facial neuralgias or tic douloureux. In such cases a palliative procedure may be indicated for obtaining a differential diagnosis and to prevent a permanent error. Finally, it is our experience that if patients are presented with the possibilities of the temporary and the permanent type of procedure and then given the opportunity to make their choice between the two, many will elect the palliative procedure for the original operation.

We disagree with Peet and Echols\textsuperscript{11} who stated, "A poor excuse for performing this procedure [temporary interruption of 5th nerve function] is that it will teach how anesthesia of the face feels. It is highly improbable that any patient suffering from severe trigeminal neuralgia ever refuses the intracranial operation because he did not like the anesthesia which a nerve injection temporarily produced." This is probably true, but it does not alter the fact that if the patient has the permanent operation originally, he may be unhappy about it. We, therefore, agree with Sachs\textsuperscript{12} who stated, "Following the radical operation, there is a permanent anesthesia which some patients find extremely annoying; following an alcohol injection there is the same type of anesthesia but it is transient, and when the nerve regenerates the anesthesia disappears. If the patient knows what the anesthesia following an alcohol injection feels like he subsequently accepts more willingly the permanent anesthesia which follows operation."

There seems no doubt that alcohol injection of the branches of the 5th nerve is the most widely used of palliative procedures in spite of the fact that it is a most trying ordeal for both the patient and the surgeon—one that many surgeons are anxious to avoid if possible. Many patients are unwilling to submit to a second injection because of the intense pain experienced in the correct placement of the needle at the original procedure. Another disadvantage of alcohol injection is that it is unsuccessful in a fairly high percentage of cases. Grant\textsuperscript{5} reported a successful block in approximately 80 per cent of the cases in his series. In addition, there is an occasional occurrence of an extra-ocular palsy or of a facial paralysis. We have seen a patient injected at another clinic in whom total blindness resulted from infiltration of the alcohol about the optic nerve. Sweet\textsuperscript{13} advocated the use of radiographic control for the placement of the needles for an alcohol block of the branches of the 2nd and 3rd divisions, and this undoubtedly is an advantage in obtaining a correct placement of needles and a higher percentage of effective blocks.

The relief of pain from a successful alcohol block generally lasts no longer than 6 to 18 months. The duration of relief in Grant's\textsuperscript{5} cases averaged 11 months for the 1st division, 14 months for the 2nd division and 16 months for the 3rd division. Horrax and Poppen\textsuperscript{9} had an average relief of 6 months for the supra-orbital, 12.4 months for the infra-orbital, 12.4 months for the maxillary and 14.3 months for the mandibular. Longer periods of relief
occasionally occur, but these are not the rule, and one cannot with any degree of assurance promise the patients more than 1 year of relief. Sweet reported that with radiographic control the average relief of pain from injection of the 2nd division was 7 months. Of 54 patients in whom 3rd division injections had been made, 30 were followed; they had had relief of pain for an average of 30 months. This is an unusually long period of relief following an alcohol injection and one wonders if it does not result from infiltration of the alcohol into the gasserian ganglion which ordinarily is looked upon as a dangerous procedure to attempt deliberately. In any event, alcohol injection of the 3rd division provides longer relief than that obtained in 2nd division blocks.

Avulsion of the supra-orbital and/or infra-orbital nerves in trigeminal neuralgia of the 1st and/or 2nd divisions is a simple and relatively benign procedure. The avulsion can be accomplished with practically no discomfort to the patient. It is a far less terrifying experience to the patient than an alcohol injection. Hospitalization is required but the patients can return to their homes after 3 days. In fact, most patients can leave the hospital within 24 hours and have the sutures removed in the out-patient department.

Avulsion of the branches of the trigeminal nerve has been mentioned by many writers as an adequate palliative procedure, but has been given very little attention. The use of alcohol injection has occupied the limelight in descriptions of the palliative procedures. It is our feeling that this is an injustice to a most valuable procedure. For this reason we have made an analysis of the private patients treated in one hospital from 1935 to 1949.

A total of 151 patients with trigeminal neuralgia have been treated. It is of interest to note that the right side of the face was involved in 100, the left side in 47, and in 4 patients the lateralization was not recorded. A similar predominance of the right side has been noted by Grant and Horrax and Poppen. The involvement of the branches of the 5th nerve in our series was as follows:

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<tr>
<th>Division</th>
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<tbody>
<tr>
<td>1st division</td>
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<td>2nd division</td>
<td>37</td>
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<td>3rd division</td>
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<td>1st and 2nd divisions</td>
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<tr>
<td>2nd and 3rd divisions</td>
<td>30</td>
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<td>1st, 2nd and 3rd divisions</td>
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It is important to note that 51.6 per cent of the patients had their pain confined to the 1st or 2nd division or both the 1st and 2nd divisions. In a series of 468 patients reported on by Horrax and Poppen, 30 per cent had their pain confined to these divisions. It is in this group that avulsion is particularly indicated in preference to alcohol injection.

Of the 151 cases of trigeminal neuralgia in the present series, primary retrogasserian neurotomy was performed in 42. The remaining 109 patients
underwent either alcohol injection or avulsion or both, done either in this clinic or elsewhere, and it is with this group that we are concerned.

Sixty-one alcohol injections were done in the group that had palliative procedures. Follow-up information was obtained on 49 patients. The average duration of relief was 15.5 months, the relief ranging from no relief to 9 years. There were no deaths in the group, but in 1 patient injected elsewhere blindness developed following injection. It is of interest to note that there were 3 patients in the group who reported no relief after the development of anesthesia over the desired distribution following injection, and all 3 obtained relief from posterior rhizotomy.

Seventy-four avulsions were performed in the group of 109 patients. Follow-up information was obtained on 55, and the 19 patients we have not been able to follow all had reported relief at the time of their hospital discharge. The average duration of relief reported by the 55 patients was 33.2 months, the duration ranging from 5 months to 8 years. In a few cases, avulsions were repeated but the majority of the patients underwent retro-gasserian neurectomy when the pain recurred. There were no deaths and only 1 complication in the group—a mild postoperative infection following an infra-orbital avulsion.

It is not necessary to describe the technique of supra- and infra-orbital avulsion. There are several factors, however, that we feel are worthy of mention. The choice of anesthesia in most instances is local infiltration with 1 per cent procaine and direct infiltration of the nerve when it is exposed. We have used a combination of sodium pentobarbital 0.1 gm., morphine sulfate 0.08 gm., and hyoscine hydrobromide 0.004 gm. 1 hour preoperatively, and find this is most effective in allaying the natural apprehension of the patient. In many instances the patient has a complete amnesia for the procedure as a result of the premedication. In many cases sodium pentothal has been administered as the avulsion was accomplished, and our anesthesiologists have convinced us that this is a perfectly safe procedure. It probably is important to point out that in order to avoid an external scar, infra-orbital avulsions are done by the intra-oral route. The procedure is an avulsion, and every effort is made to remove as much of the nerve as possible in order to delay its regrowth. By grasping the proximal end of the cut nerve in two hemostats and exerting firm traction on it a rather long segment of nerve may be removed. Similarly the peripheral end should be avulsed. We have also found it helpful in the infra-orbital avulsion to insert a needle, insulated except for a ½ cm. point at the tip, into the infra-orbital foramen following the avulsion and to apply heat from the electrosurgical apparatus until charring of the soft tissues results.

The entire procedure of supra- and infra-orbital avulsion rarely requires more than 20 minutes. We maintain the patient on prophylactic penicillin for a period of 72 hours to prevent infection in the postoperative period. We have found the long-lasting penicillin quite effective, and this may be
given by the patient’s family physician or in the out-patient department if the patient is discharged prior to the completion of the penicillin therapy.

SUMMARY

We believe the palliative procedures for the alleviation of pain in trigeminal neuralgia have an important place in the proper care of these patients. In the literature alcohol injection has received far greater attention than nerve avulsion as a palliative procedure. It is felt that this is an injustice, since avulsion is simpler and gives more effective relief. This is particularly true if the neuralgia involves the 1st, or the 2nd, or both of these divisions of the trigeminal nerve. Alcohol injection should be reserved for those cases in which the pain is confined to the 3rd division.

An analysis of 109 cases in which palliative procedures were done shows that the average relief from supra- and infra-orbital avulsion was 33.2 months, whereas that from alcohol injection was 15.5 months.

REFERENCES