

## THE NEUROSURGICAL MANAGEMENT OF INTRACTABLE PAIN

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The management of intractable pain can represent a sore trial for the patient and the physician alike. To the patient presenting himself with this common symptom, it is usually the most significant phase of his ailment and the one from which he desires most to be relieved, regardless of its cause. To make a diagnosis and to make the patient comfortable while directing attention to the elimination or amelioration of the cause of the pain should be almost axiomatic with the physician. Hypnotics and analgesics have been used with varying degrees of relief in the individual case. Employed often in near-lethal doses to accomplish the desired effect, the penalties of prolonged usage often outweigh the benefit of their administration. Hence the application of neurosurgical measures in certain cases affords a more satisfactory solution, both from the standpoint of the patient and of the physician. Interruption of the pain conduction pathways forms the usual basis of this type of treatment.

The neurosurgical management of headache due to encroachment upon the cranial cavity by mass lesions such as tumor, abscess, subdural and extradural hematomas or hydroma resolves itself largely into a problem of removing the offending agent when possible, or resorting to decompression measures when their removal is impossible. This form of pain is due to the disturbed intracranial fluid dynamics and relief is obtained by re-establishing as relatively normal fluid relations within the skull as is possible. Of somewhat different mien is the post-traumatic or post-inflammatory headache, when often no alteration of intracranial pressures exists. The use of encephalography or the direct insufflation of the subdural space on the affected side with air often affords relief to this particular group of patients as well as being of diagnostic value. In some severe unilateral post-traumatic headaches, relief can be afforded by interruption of the nerve supplying the painful zone. This nerve may be the supra-orbital, the greater occipital or the nervus spinosus, which accompanies the middle meningeal artery.

The pain of trigeminal neuralgia or tic douloureux is so well known that it hardly needs discussion. The afflicted patient will, in most cases, gladly exchange this excruciating pain for the anesthesia of the involved area which gives the much desired relief. The more temporary method of treatment is the alcohol injection of the various divisions of that nerve or their peripheral excision.

Recurrence of this pain usually follows these procedures in periods varying from several months to two years. With frequent repetition of the injections, the attendant fibrosis decreases the effectiveness of

each injection until this method is no longer of any service. Permanent relief of pain is always experienced by those patients submitting to the total or the subtotal section of the posterior root of this nerve. The danger of a facial paresis is minimal and the numbness is permanent in the areas supplied by the sectioned nerve.

Atypical facial neuralgia should be carefully differentiated from trigeminal neuralgia in the consideration of facial pain, and in the use of surgical methods for its relief. Alcohol injections and section of the fifth cranial nerve are of no benefit in these cases.

Another painful affliction, resembling in its severity *tic douloureux*, is the more recently described glossopharyngeal neuralgia. Possessed often of a trigger point much like that of the true tic, and giving rise to an agonizingly severe, usually unilateral pain in the pharynx, larynx, eustachian tube or inner ear, this condition is every bit as distressing to the patient as is trigeminal neuralgia. Complete relief without any motor impairment of the laryngeal or pharyngeal musculature is obtained by intracranial section of the ninth cranial nerve through the unilateral approach.

Intractable pain due to a compressing or irritative lesion affecting either the spinal cord or its roots is a condition which requires laminectomy. Careful diagnostic approach to the problem will usually differentiate between a true neoplasm, herniation of the intervertebral disc, hypertrophied ligamentum flavum and other conditions less suitable to removal with amelioration of pain. In the event an inoperable lesion is found, decompression and section of the posterior nerve roots to the involved area afford the patient relief from pain.

Similarly, rhizotomy or intradural section of the posterior nerve roots as they leave the spinal cord has been a valuable aid in the treatment of *tabes dorsalis*, post-herpetic neuralgias and certain pain syndromes associated with visceral disease. In these conditions the response is not uniformly satisfactory, as neither the origin of the pain nor its mode of production is known.

Pain in an arm due to compression of the nerves or blood vessels by a cervical rib, a fibrous band, or a spastic hypertrophied anterior scalenus muscle is very satisfactorily treated by removal of the offending pressure agent or by division of the fibrous band or muscle.

As the knowledge concerning the parasympathetic and the sympathetic nervous system increases, more weapons are added to the neurosurgical armamentarium. Relief from the excruciating pain of *angina pectoris* is sometimes obtainable by the alcohol injection of the upper four thoracic ganglia of the left side. Laminectomy with excision of the middle, inferior cervical and first thoracic ganglia in the left has also resulted in freedom from pain. Section of the superior cardiac nerve

has been effective in the relief of anginal pain, as has been the posterior rhizotomy. In severe primary dysmenorrhea, presacral neurectomy has been performed many times and has been uniformly successful when more conservative methods of treatment failed. This operation has also been successfully used in patients suffering from intractable pain due to inoperable carcinoma of the cervix and the uterus. Similarly, presacral neurectomy may be used to relieve the pain of a longstanding cystitis. However, in cases of malignancy of the bladder, it has been found necessary to remove both the sympathetic and parasympathetic innervations at the cost of a "cord bladder" to gain complete relief, although possibly cordotomy would be the operation of choice here.

Pain having its origin in the abdominal viscera may often be relieved by paravertebral alcohol injections by noting first the level of skin anesthesia at which pain disappears when a high spinal anesthetic is used and then using that dermatome level as an indication of the injection level. This treatment is effective for such lesions as carcinoma of the esophagus and upper gastro-intestinal tract, including the pancreas.

Neurosurgical methods are often the sole hope for the pain-wracked sufferer from an advanced malignancy of the lower sections of the body. Careful subarachnoidal injections of alcohol, done in such a fashion as to strive for its selective effect upon sensory nerves or their fibers supplying the involved area, frequently give marked relief from pain. Potential harm to the nerves supplying the bladder and rectum must be weighed against the relief of pain to be gained, together with the stage of the malignancy and the life expectancy. Cordotomy is an operation used all too seldom for the relief of pain of inoperable cancer. In this procedure an incision is made into the cord itself in such a position that the spinothalamic tracts are interrupted. Using this operation, relief of intractable pain is possible without impairment of motor function and it certainly makes the last days of these unfortunates pain-free and enjoyable to a degree hitherto not attainable by other measures.