bellum. He has been able to work ever since his discharge from hospital. Radiographic films reveal a definite area of calcification inside one cerebellar hemisphere, a calcified tuberculoma.

I show these last four patients as a contrast to the patient (Case 6) with the appalling hernia cerebri, in order to emphasise the fact that our lack of knowledge of the underlying lesion should not prevent us from treating the patient. Many of our results are bad, but some are better than we have a right to expect.

We are justified in refusing to operate when there is definite evidence of secondary carcinoma, and when we know that the patient has a glioblastoma. Evidence of the latter lesion can be obtained by arteriography or by aspiration of tissue through a trephine opening. Incidentally, either of these methods may reveal the existence of a chronic subdural hema-
toma. This lesion so often gives rise to a clinical picture resembling that of a glioblastoma that its exclusion should be attempted as a routine measure. Quite frequently it is found when not suspected, and suspected when it is not present.

Other curable lesions may simulate tumours; in the search for the latter we may encounter the former—if there be no search there can be no profit.

Reference:
Bailey, Percival. Intracranial Tumours. (1933).

THE NEUROSURGICAL RELIEF OF PAIN.*

By J. P. LANIGAN

It frequently falls to the lot of the neurosurgeon to treat pain in its pure form. Then he attempts to abolish or alleviate pain whilst appearing to ignore the underlying pathology. Possibly the best example of such an operation is that of chordotomy whereby the spino-thalamic spinal tracts are cut in order to abolish the sensation of pain associated with inoperable malignancy anywhere below the shoulder level. In this operation a condition simulating syringomyelia is produced; when carefully performed it will give a result most gratifying to both the patient and the attending physician.

Chordotomy is an old operation. First performed by Spiller in 1911, it was the only way of relieving such pain until Dogliotti introduced his technique of spinal subarachnoid injection of alcohol in 1930.

The spinal subarachnoid injection of alcohol is particularly useful in cases of "frozen pelvis" with severe pain over the sciatic or obturator distributions. It is a simple operation and consists essentially of injecting 0.5 c.c. or less of absolute alcohol into the lumbar theca. The patient has to be carefully placed, so that the nerves aimed at are at the highest point of the lumbar sacs, thus ensuring that the alcohol (which is lighter than C.S.F.) will strike the required posterior nerve roots. These injections can be carried out in all cases of inoperable pelvic

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malignancy, and usually do not necessitate a stay of more than 48 hours in hospital. There are, however, certain important rules to be observed in carrying out the injection, hence I would strongly advise the reader to consult the relevant literature on the subject before attempting it.

In my own practice I have treated cases referred to me suffering from sciatic and obturator pain secondary to rectal carcinoma, prostatic carcinoma, and other malignant pelvic conditions such as carcinoma of the cervix; in the great majority of cases the pain has either been completely relieved or considerably lessened.

The operation of pelvic sympathectomy is also useful, especially for midline pelvic pain such as occurs with rectal tenesmus, bladder pain, and pain associated with vesico-vaginal and recto-vaginal fistulae. At this stage it is well to remember that sometimes the pain complained of might be caused by hypometria, and therefore possible to treat by the simple procedure of dilating the cervix, thus permitting drainage of the uterine cavity.

Cases of trigeminal neuralgia or tic douloureux offer another example of a severe crippling pain, possibly the worst inflicted on mankind and with no definite underlying cause. It has been suggested that the etiology of this pain is dental sepsis, and the majority of our patients are edentulous. Whilst agreeing that these patients should have a very thorough dental overhaul before being subjected to any procedure aimed at inhibiting the conducting power of the trigeminal nerve, I am not at all sure that we know the cause of this condition. Trigeminal neuralgia of the tic type usually commences in the fourth decade and appears to be commoner in women in a proportion of three to one. It is essentially an intermittent pain of a stabbing character and is precipitated by talking, eating, washing the face, etc. Such patients are really in a pitiable state from fear of eating, lack of sleep, and frequently are border-line drug addicts. Having excluded obvious causes of pain in the face such as dental caries or empyema of the antra, and such rarer causes as tumour in the cerebello-pontine angle and aneurysm of the infra-clinoid segment of the internal carotid, there remain three methods of treatment to offer the patient: (1) to inject the nerve temporarily with alcohol; (2) to divide the sensory root of the nerve by the Frazier sub-temporal operation; (3) to inject the ganglion itself. With a new case I always advise an alcohol injection as it teaches the patient what to expect from having part of the face anæsthetised.

Both the maxillary and mandibular divisions are suitable for alcohol injections separately, depending on the side and radiation of the pain. The injection can usually be repeated on a few occasions. However, after some time it becomes impossible to repeat these peripheral injections on account of fibrosis set up by the alcohol; then the only course open to us is either to inject the Gasserian ganglion itself with alcohol or to perform the root resection. Either operation will give lasting relief with, of course, anæsthesia of the corresponding side of the face. A surgeon dealing with cases of trigeminal neuralgia should be capable of performing any of these operations as there are certain technical points in each which make them applicable to individual cases.

Before performing an alcohol injection of the ganglion it is most important to explain to the patient the need for careful attention to the