TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the nervous system met with in general practice.

THE MANAGEMENT OF INTRACRANIAL TUMOUR

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A prime consideration in the surgical treatment of a case of intracranial tumour is the operative mortality rate. In expert hands, with determined effort to secure radical removal, this rate is nowadays 10 to 20 per cent., reckoned by the standard that any patient who dies in hospital after operation is an operative death. The best end-results to date show one in every four patients of an unselected series of cases living a useful working life approximately ten years after operation. Such results have been obtained by the concentration of cases in centres where particular study is made of the diagnostic and therapeutic problems peculiar to this condition. With the advantages of modern transport, treatment in a neurological centre is available to every patient, and there is no longer need to compromise by doing emergency palliative operations in places where special facilities are lacking. There is, nevertheless, much the general practitioner can accomplish, not only in the recognition of the early stages of the disease, but in the management of increased intracranial pressure and in giving general advice to the patient and his relatives.

Paroxysmal morning headaches and swelling of the optic disks presage rising intracranial pressure, and are the most usual early signs. However, varieties of intracranial tumour occur in which headache, papilloedema, and vomiting only appear very late. It must be emphasized, therefore, that any impairment of cerebral function *which tends to progress* should come under suspicion. This is true not only of a hemiplegia which increases in severity or of focal Jacksonian epilepsy with gradual impairment in function in the part involved, but also of increasing disturbance of vision, speech, or memory. Alone, or in various combinations, these derangements commonly indicate the effect of progressive compression or destruction of cerebral substance by a neoplasm. The repetition of sudden, but transient, severe exacerbations of headache indicates a particularly urgent need for treatment.

Procedure in Investigation

Skilled clinical investigation and evaluation of the history is the first essential in the steps which lead to localization of the neoplasm, and decision as to manner and practicability of surgical attack. Stereoscopic x-ray examination of the skull gives valuable collateral evidence, not only from the occasional calcification of the neoplasm itself, but also from changes in neighbouring bony structure.

Study of the evolution of the clinical picture, usually in combination with radiological evidence, has done much to enable a fair estimate of the pathological nature of a tumour to be made before exploration. The most benign tumours are the cerebellar astrocytoma (glioma) and haemangioblastoma (vascular tumour with cyst), the colloid tumours of the cerebral ventricles, the meningioma

(dural endothelioma), cholesteatoma and dermoids, pial cysts, and pituitary adenoma. All these tumours are favourably disposed for surgical removal, and each not uncommonly presents features enabling pre-operative identification to be made. The remaining common varieties of glioma have a rapidly growing, infiltrating edge, and tend to recur after excision. The medulloblastoma of the cerebellum in young people and the glioblastoma (spongioblastoma) of adult life are the most malignant. Their symptoms, as a rule, progress rapidly, and because of this a fairly accurate pathological diagnosis can sometimes be made on clinical grounds, and in some cases it is right that operative treatment should be withheld. It is not, however, always possible to distinguish clinically between the malignant cerebellar medulloblastoma and the benign cerebellar astrocytoma, and, furthermore, certain favourable expanding intracranial lesions, like abscess and subdural haematoma, may on occasions closely simulate malignant intracranial tumours in their clinical picture. Malignancy alone is not always a contraindication to surgical intervention, and even with metastatic tumours experiences of the isolated metastasis occurring years after removal of the primary source leave the impression that years of survival might in some cases be obtained by surgical attack.

When the probabilities of localization and pathology have been narrowed down by skilled clinical and radiological examination further information is frequently desired, and ventriculography, and occasionally arteriography, are used. These procedures come properly only when the stage is set for immediate operation, owing to their liability to bring about a crisis in the state of intracranial pressure.

Danger of Lumbar Puncture

The size of a tumour within the cranial cavity increases at the expense of both the bulk of the brain and the total quantity of cerebro-spinal fluid. To attempt to relieve the pressure by withdrawal of cerebro-spinal fluid by lumbar puncture brings about increase in bulk of the compressed cerebral substance. This is extremely dangerous by reason of the tendency of the swelling brain to compress the medulla by a cone-shaped hernia of cerebellum through the foramen magnum. When papilloedema, headache, and vomiting have already declared the presence of high intracranial pressure neither lumbar puncture nor ventricular puncture should be performed unless these are absolutely necessary for pathological diagnosis and unless operative exploration can immediately follow. The minimum amount required for Wassermann test, cell count, and protein estimation (3 c.cm.) should be withdrawn.

The Removal of Tumours

The technical procedure of removal of an intracranial tumour rests with the surgeon concerned, and each case becomes a separate problem. For cerebellar tumours it is accomplished by permanent removal of the bone between the foramen magnum and the lateral sinus. On completion of the operation the muscles of the back of the neck are stitched back into place, giving ample protection to the area from which bone has been removed. For tumours above the tentorium approach is made by an osteoplastic bone flap, the bone being subsequently replaced. A small gap in the skull does not require any

special protection, but on account of the particularly unpleasant effects on the brain itself when it bulges far through a large opening ("hernia cerebri") the modern tendency is invariably to replace the osteoplastic flap at the conclusion of operation.

Operative Decompression

The operation of palliative decompression was until quite recent years in general use, with relief from headache and the saving of vision as primary objectives when the tumour itself could not be approached. In some respects this practice has undergone a radical change. Cerebellar decompression still remains a useful operation, especially as a first stage in the approach to the more difficult posterior fossa tumours. Subtemporal decompression, which leaves the bony opening securely covered by temporal muscle, has occasional value, though employed less and less. Wide, unprotected decompression of the frontal and parietal regions has been completely abandoned by most neuro-surgeons. The release of a large area of brain from the internal pressure results in even more eventual damage than release of a small area. Hemiplegia and hernia cerebri frequently followed, to confuse the signs already due to the tumour; vision as often as not continued to deteriorate; and an unhappy existence was unduly prolonged. With the advantage of improved methods the surgeon prefers nowadays to make radical excision of a cerebral tumour, closing the osteoplastic flap firmly in all cases, even if recurrence of the neoplasm is likely. By this method the period of relief from symptoms that follows removal of the tumour is not interfered with by an unsightly cerebral hernia, and the duration of the illness that sets in when the tumour grows again is mercifully short.

Decompression by Hypertonic Solutions

The injection of hypertonic solutions into the blood stream dehydrates the bodily tissues as a whole, including the brain and any tumour that is present. Withdrawal of fluid in this manner rapidly and most effectually relieves increased intracranial pressure. For this purpose either 30 to 50 c.cm. of a 15 to 30 per cent. solution of sodium chloride or 30 to 50 c.cm. of a 50 per cent. solution of glucose are employed. This intravenous injection should be given very slowly indeed. The effect is often dramatic, but within a few hours a counter-effect often occurs, for which a further injection is less effective. For this reason intravenous hypertonic solution is reserved for conditions only of extreme urgency, where continuous attention is available and operation can be quickly begun. In some circumstances it may be used to allow a patient to travel.

For prolonged relief, either during investigations to establish localization before operation, or in cases judged inoperable, regular rectal injections of magnesium sulphate are given. Six ounces of a 30 to 50 per cent. solution of magnesium sulphate in water are run slowly into the rectum, and the patient is instructed to retain it as long as possible (usually ten to thirty minutes) before voiding the increased volume of fluid that accrues. This should be given at first twice daily. The maximum effect appears only after several days, following which the instillation may be given only once daily. In such a way patients may be spared distressing symptoms for weeks or even months. In recurrent or malignant tumours the inevitable termination is thus postponed, and the terminal stages are more brief. In the general management of cases of increased intracranial pressure rectal magnesium sulphate, injected as above, is of importance. A similar, but usually less satisfactory, effect can be secured by regular dosage of half an ounce of magnesium sulphate by mouth, with restriction of fluid intake.

Deep X-Ray Therapy and Radium

Normal nervous tissue has high resistance to the effect of radiation by radium or deep x rays, a property which is unfortunately shared by most of the neoplasms which arise within it. So far temporary success has been obtained with the rapidly growing medulloblastomas and with some of the oligodendrogliomas. On occasions verified cases of spongioblastoma multiforme have also reacted well. The treatment should be in the hands of expert radiotherapists. Severe immediate reaction may occur in the tumour. Except on expert neurological advice such therapy is confined to cases in which the nature of the neoplasm has been verified at operation. Arteriovenous aneurysmal tumours may react well to deep x-ray therapy, but this is not invariable.

Medicinal Treatment

Apart from direct surgical attack the relief of symptoms of rising intracranial pressure by hypertonic solutions is by far the most effective of medicinal procedures. For recurrent vomiting full doses of atropine are sometimes prescribed. Headache may be intense in spite of dehydration, and is treated by analgesics such as the combination of aspirin and pyramidon, 10 grains each, repeated four-hourly. Morphine is extremely dangerous when the pressure is high, owing to its depressant action on a respiratory centre already labouring under difficulties. Epileptic attacks should be treated by luminal and bromides by mouth, and if status epilepticus supervenes paraldehyde, 2 drachms four-hourly by mouth, with luminal sodium, 3 grains intravenously, is the most satisfactory treatment. Extreme restlessness is controlled by chloral, bromide, and paraldehyde.

Finally, it may be observed that increase in intracranial pressure has origin in states other than cerebral tumour—not only in subdural haematoma and the like, but in hydrocephalus of various kinds—and most detailed and accurate clinical investigation is therefore absolutely essential to adequate treatment.

PRESENTATION TO SIR ARTHUR ROBINSON

Sir Kingsley Wood, the Minister of Health, made a presentation of plate, on December 5th, to Sir Arthur Robinson on behalf of a large number of Sir Arthur's colleagues and friends in the Ministry. Sir Arthur was Secretary of the Ministry of Health from 1920 to 1935, and resigned this post on October 31st last to undertake the duties of Chairman of the Supply Board. The Minister, in making the presentation, said that they had met to do honour not only to a great civil servant but to a true friend of them all. Sir Arthur passed first into the Civil Service in 1897, and in 1920 succeeded Sir Robert Morant as Secretary to the Ministry of Health. Perhaps his most trying experience had been to serve under no fewer than nine Ministers of Health, but he had nevertheless directed their immense legislative achievements of the last fifteen years and the progressive expansion of the social services.

Sir Arthur Robinson, in expressing his thanks to the Minister and to his colleagues, said that there was no rest for the good, and he could foresee none for the Ministry of Health, but he hoped they would remember in the mass of new legislation not to neglect the great task of administration. With more and more legislation they must beware that the consolidation of past gains was not forgotten. There was much more to be done and many more problems to be solved. How, for instance, could one reconcile the preservation of a local spirit—the strength of local government—with the tendency of local institutions to become agents of the State? The work of the Ministry of Health was constructive in the highest degree. In so far as the Ministry constructed it should succeed; in so far as it did not it would fail in its work.