Proceedings of the Society of British Neurological Surgeons

The 77th meeting of the Society of British Neurological Surgeons was held in Coimbra, Portugal, on 31 May-2 June 1968, as a joint meeting with the Portuguese—Spanish Society of Neurosurgery.

CRANIOPHARYNGIOMATA

ALAN SUTCLIFFE KERR (Liverpool) referred to a paper which he read before the Society in 1957 in which he reviewed the results of treatment, during the previous 10 years, of 27 patients suffering from craniopharyngioma. Nineteen patients had died following palliative or radical treatment. However, in the five-year period preceding 1957, four patients out of six had survived radical removal and were regarded as cured. These improved results were attributed to the introduction of the use of (a) cortisone and (b) operative hypothermia. Unfortunately, in the period since 1957 this improvement in results has not been maintained. In the past 10 years, of 11 further cases, 10 have been subjected to surgery with five deaths. Three of the five survivors had complete excision of the tumour, the two others had a partial removal. Of three further cases treated in the Liverpool Neurosurgical Department by sub-total excision, two survived, one now for 10 years.

Details of the 41 cases were given. Half of the patients presented before the age of 20, but a significant number did not complain of symptoms until as late as the fifth or sixth decades, suggesting the probability that, with complete removal and proper substitution therapy, children might be expected to achieve a normal span of life. Mr. Kerr felt that a survival rate of less than one-third and only one-sixth of his patients enjoying a complete removal of their lesions was a disappointing record compared with that of Dr. Donald Matson of Boston, whom he had recently visited.

He stated that Dr. Matson had performed radical removal in 50 successive cases of craniopharyngioma without a single death in a primary case and with only three deaths in 13 of the 50 who had had limited excision elsewhere. He said that Dr. Matson attributed his success to the meticulous endocrinological and biochemical supervision by his colleague, Dr. John Crigler, and to certain points of surgical technique.

EFFECTS OF PROTON RADIATION ON THE MONKEY'S BRAIN

PETER GORTVAI (London) reported on the effects of proton radiation on the monkey’s brain. The region of the internal capsule in the *Cebus albifrons* monkey’s brain was irradiated with the Bragg ionization peak of a 7-mm diameter proton beam from the Harvard cyclotron, using a stereotactic technique. Irradiation up to 50 krad given at 1 krad/min causes no immediate changes in the latency of forearm movement obtained by stimulation of the cerebral motor area. It does not change the latency of cortical evoked potentials or the electroencephalogram. Following irradiation the animals develop abnormal neurological signs after a length of time in reciprocal relationship with the logarithm of the dose given. Rise in the threshold of cortical stimulation is the first observed effect and the threshold increases tenfold in a few days. Flattening of the electroencephalogram and phase reversal appear meanwhile. Evoked cortical potentials are extinguished next and clinical neurological abnormalities are seen last during the development of a hemispherical radiation lesion.

Brains of animals killed at different times were examined. In early radiation lesions there is damage to the endothelium of blood vessels and an inflammatory reaction. Tissue necrosis occurs later. The appearance of tissue necrosis is associated with progressive neurological and clinical abnormalities. Lesions of lesser severity cause no demonstrable neurophysiological changes.

METHODS OF LOCALIZATION OF INTRACRANIAL ABSCESS

JOHN GARFIELD (Southampton) surveyed 200 cases of proven supra-tentorial abscess admitted to Atkinson Morley’s Hospital, the National Hospital, Queen Square, and the Wessex Neurological Centre. The cases were considered in two groups: 100 between 1951 and 1957 and 100 between 1962 and 1967. The departments concerned admitted without delay patients at all stages of the disease, the majority being acute. Follow-up was obtained in about 80% of survivors up to 1967. Overall mortality in the first period was 37 and in the second, 42. Of the 20 patients admitted in 1967, 10 died. The possibility that this lack of improvement could be ascribed to changes in the natural history and presentation of the disease was discounted from evidence derived from another part of the survey, which was not reported on this occasion. Three major factors appear to be responsible for the failure of improvement in the results of treatment of cerebral abscess: first, misuse of antibiotics; second, dilatory surgery; and third, inaccurate localization. Failure of accurate localization was responsible for much of the mortality and the factor of localization was considered in detail in relation to five possible methods: (1) site of ENT sepsis, (2) EEG, (3) ventriculography, (4) carotid angiography, and (5) brain scan.

ENT sepsis as a cause of abscess has not diminished, being responsible for 56% of cases of the first group and
55% of the second. Evidence of ENT sepsis being the cause of the abscess was overt suppurative otitis media, recent mastoidectomy, frontal swelling, frontal osteomyelitis, or recent frontal sinus drainage. In 58 patients localization was made solely on such evidence and was accurate on 55 occasions. Particularly striking were the results with subdural abscess, the detection of which is often difficult by radiological methods. This study confirmed the findings of others, that the EEG proves a disappointing guide to localization, being only 50% accurate. Review of records showed that areas of phase reversal and electrical silence when present are more important than the areas of high voltage slow wave activity, which may be widespread. Ventriculography, used in 77 patients (in 21 the abscess, subdural or intracerebral, being aspirated at the same time), gave accurate localization in 84% and caused deterioration in 8%. It was also shown that for parietal abscesses the accuracy of ventriculography is higher than any other method. Carotid angiography, used in 74 patients, although always accurate for the temporal intracerebral abscess, was accurate in only 66% of subdural, frontal, or parietal abscesses. He stated that many authors have reported the accuracy of scanning in the localization of brain abscess, and, with the introduction of Technetium 99 and more recently Indium which obviates delay, scanning is becoming the investigation of choice. In the 11 cases described scanning achieved accurate localization in them all. He concluded that this survey indicated the following order of accuracy of localization of cerebral abscess: (1) brain scanning, (2) site of ENT sepsis, and (3) ventriculography.

CEREBRAL RADIOISOTOPE SCANNING

F. J. GILLINGHAM and A. A. DONALDSON (Edinburgh) reported their experience of 483 cases followed for periods up to 33 months of which 444 were classified as tumour suspects. This term covered a wide range of cases from a very definite clinical picture of tumour to suspicion only. The remaining group consisted of 39 patients, 17 of whom suffered from infection and 22 who were cases of spontaneous intracranial haemorrhage, usually suspected of harbouring an intracranial clot. Only seven of the 17 infected cases gave a positive or abnormal scan. Two had subacute cerebral abscess and two were diagnosed as 'thrombophlebitis', which resolved without abscess formation with chemotherapy. Two cases of encephalitis gave a positive scan as did also a tuberculoma, which initially was thought to be a tumour. Of 10 cases showing a normal scan, five were cases of encephalitis, with one case each of pneumococcal meningitis, tuberculoma, subependymal abscess, thrombophlebitis, and subacute bacterial endocarditis with embolic phenomena. Three of the intracranial haemorrhage cases showed a positive scan—with a single intracranial clot found at operation. They did not consider scanning in spontaneous intracranial haemorrhage to be a valuable diagnostic aid.

Verified or probable tumour was encountered in 176 cases. Most tumours were confirmed by angiography or encephalography or other contrast examination, and by operation and histology. A number were also confirmed at necropsy. The tumours were classified as in the Table.

<table>
<thead>
<tr>
<th>Tumours</th>
<th>No.</th>
<th>Positive scan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain-stem</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Pituitary region</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Posterior fossa</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>Supratentorial</td>
<td>89</td>
<td>76</td>
</tr>
<tr>
<td>Secondary</td>
<td>53</td>
<td>43</td>
</tr>
</tbody>
</table>

TUMOUR EXCLUSIONS

EPILEPSY (85 CASES): NORMAL SCAN (81 CASES) Three scans were reported inconclusive, probably normal. Only one scan suggested a lesion, but subsequent contrast investigations were negative. A negative scan is therefore sufficiently reliable to be reassuring in cases of epilepsy, either focal or generalized, where no definite clinical abnormalities are present. The EEG in such cases may be normal or abnormal.

DEGENERATIVE VASCULAR DISEASE (74 CASES) In chronic degenerative vascular disease, including stenosis and occlusion, the scan is usually normal—51 cases. Abnormal scans were obtained in 23 cases. An increased uptake was found in nine acute obstructions of which eight were confirmed radiologically and surgically. Diminished uptake was found in six chronic vascular occlusions and three were confirmed radiologically. Inconclusive findings were obtained in eight cases.

DEMELINATING DISEASE (13 CASES) All negative.

MISCELLANEOUS GROUP (96 CASES) All negative. This group included pre-senile dementias, cases of chronic headache, pseudo-papilloedema, benign intracranial hypertension, migraine, and vasovagal attacks, which were scanned to exclude tumour or subdural haematoma.

MULTIFOCAL LEUCO-COAGULATION IN PSYCHIATRIC ILLNESS

H. J. CROW and D. G. PHILLIPS (Bristol) described their experience with 70 psychiatric cases using chronically implanted intracerebral electrodes. A preliminary report was published by them in this journal in 1961.

The electrodes used consist of fine gold wire (150 μ diameter) insulated by epoxy resin except for the terminal 4 mm of each wire. The wires are twisted together in sheaves of three to seven, each wire being cut 8 mm shorter than the previous one and separated from the next by a 4 mm interval. The sheaves of electrodes thus formed are inserted by a stereotaxic technique through a burr hole at the coronal suture 3 cm from the midline on each side. Thus 60 electrodes are distributed across the frontal lobes and adjacent to the anterior 4 cm of the cingulate gyri. Coagulation is performed through selected electrodes using direct current (10 to 20 mA, for 180 seconds). The number and size of the lesions are increased by stages according to the patient's response.

This treatment has been used in patients suffering from intractable anxiety and obsessional syndromes with histories from five to 20 years who failed to respond to other methods of treatment. In the treatment of anxiety states the orbital white matter 0.5 to 1 cm in front of the

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anterior clinoid processes has been coagulated. In obsessive states lesions have been made in the anterior 4 cm of the para-cingulate white matter. The authors reported a good clinical response in 84% of cases followed for a year or more; there have been no mortality and no neurological deficits following operation. Only one patient has required treatment for epilepsy and he had previously been subjected to closed orbital leucotomy. They reported also a mean post-operative increase of 9% in I.Q. scores.

THE TREATMENT OF DELAYED HAEMORRHAGE FOLLOWING HEMISPHERECTOMY

MURRAY FALCONE and PETER WILSON (London) stated that delayed haemorrhage into the operative cavity and ventricular system leading to death was first described by Oppenheimer and Griffith (1966) in three out of 18 cases after hemispherectomy. A review of their own case material showed the same complication occurring in four out of 18 cases at intervals of from 64 years to 12 years after operation. Three cases survived following craniotomy and energetic lavage of the cavity; but after initial improvement, two of these developed at intervals of from one to two years a further complication of occlusion of the body of the remaining lateral ventricle in the region of the trigone. This resulted in symptoms due to dilatation of the obstructed temporal horn, but both cases have since been relieved by ventriculo-atrial shunt. The authors discussed the significance of these haemorrhagic complications and stated that possibly 25% of patients would develop this complication in time after hemispherectomy and it should be suspected in any patient showing inexplicable deterioration after this operation.

RESULTS OF TREATMENT OF PROGRESSIVE LESIONS IN SPINA BIFIDA OCCLUETA FIVE TO TEN YEARS AFTER LAMINECTOMY

L. P. LASSMAN and MICHAEL JAMES (Newcastle upon Tyne) referred to a syndrome, which they had previously described, of progressive muscular imbalance and neurological deficit associated with spina bifida occulta, resulting in foot deformity and, in some cases, trophic ulceration and incontinence. Among the causes which they had found for these neurological disturbances were diastematomyelia, intramedullary dermoid, cauda equina adhesions, ectopic dorsal nerve roots, and subcutaneous lumbo-sacral lipoma with a deep connection. They stated that the object of surgery had been to prevent further deterioration and so far 150 patients had been operated on. Follow-up from five to 10 years of 40 patients treated by laminectomy showed improvement in 17 to a significant degree and in a further six to a minor degree. There has been deterioration in one case only and the condition of the remainder is unchanged. Their criteria for laminectomy were (1) abnormality of gait associated with progressive neurological defect or incontinence, (2) x-ray evidence of a laminial defect of a greater degree than of the first sacral neural arch only, (3) myelographic evidence of a low-placed conus medullaris.

They felt that the results described above justify laminectomy in those cases which fulfil the three criteria for operation, but as yet they are unable to predetermine which cases will benefit and which will not. However, from their experiences of the whole series, the authors suggest that the symptom least likely to be improved by surgery is incontinence known to have been present from birth.

INTRODUCTION MENINGOCELE: A REPORT OF FIVE CASES AND A REVIEW OF THE LITERATURE

JOHN MILES (Birmingham) pointed out that an intrathoracic meningocele is encountered by the neurosurgeon when it is considered that a spherical paravertebral mass may be the extra-vertebral portion of a 'dumb-bell' neurofibroma. He presented five examples of this unusual condition making a total of 71 cases reported in the literature.

1. A 61-year-old man with neurofibromatosis had the signs of a 'dumb-bell' neurofibroma but at laminectomy the expanded subarachnoid space extended into the left chest as an intrathoracic meningocele.

2. A 48-year-old woman with neurofibromatosis complained of dyspepsia and her right-sided intrathoracic meningocele was satisfactorily ligated at laminectomy.

3. A 24-year-old man with neurofibromatosis had his meningocele discovered at routine chest radiography. He has been observed for 12 years.

4. A 49-year-old man with neurofibromatosis developed a cerebrospinal fluid fistula after excision of his meningocele. It resolved without further surgery.

5. A 24-year-old man with neurofibromatosis had his meningocele discovered at routine radiography. However, in this patient the bony abnormalities usually found in the vicinity of such a meningocele were evident 20 years before the development of his meningocele.

He stated that two-thirds of those with intrathoracic meningocele have other stigmata of neurofibromatosis. In the remaining cases the meningocele and its associated bony abnormalities are regarded as the only evidence of this disease. Regional dysplastic processes might be considered to be responsible for the development of the protrusion, but it was felt that the fifth case emphasized its congenital basis. Surgery was considered necessary only on development of respiratory embarrassment due to a massive meningocele, or where there was marked increase in size of the meningocele.
function occurred in this patient despite extensive laminectomy and decompression, suggesting that irreversible ischaemic necrosis of the cord had occurred. Similar cases of subdural haematoma and related intraspinal haemorrhage recorded in the literature were reviewed.

**SUBLUXATION OF CERVICAL VERTEBRAE DUE TO RHEUMATOID ARTHRITIS**

W. LUYENDIJK (Leiden) emphasized that spontaneous subluxation of the upper cervical spine in association with chronic rheumatoid arthritis is not a rare complication. He presented a survey of 11 cases, nine due to chronic rheumatoid arthritis, one in the acute form and another associated with ankylosing spondylitis. The recognition of signs and symptoms indicating medullary compression in these already seriously crippled patients is of the utmost importance. Management included nursing on an electric 'ripple' mattress with continuous skull traction combined with bilateral occipito-cervical fusion. In the more severe cases decompressive laminectomy was also performed.

He reported the results of operation in nine patients of whom two were considered to be poor surgical risks. In four cases full neurological recovery followed operation and in three cases recovery was incomplete. In two cases operation was too recent to permit assessment but so far one has shown no recovery.

**LUMBAR SPONDYLOSIS AND THE NARROW LUMBAR CANAL**

R. A. C. JONES and J. L. G. THOMPSON (Salford) stated that patients with lumbar spondylosis, with or without superimposed disc prolapse, in the presence of narrowing of the lumbar canal may show a variety of clinical presentations. There may be the syndrome of back pain and sciatica, of insidious onset, with progressive neurological deficit affecting one or both legs, or they may present with a history of typical intermittent claudication with little or no objective neurological deficit. While myelography is the most accurate radiological method of assessing the volume of the lumbar theca, and localizing the level of maximal cauda equina compression, examination of the plain films can give valuable information about the size of the spinal canal. By observing the ratio of the size of the canal to the adjacent vertebral body at each segment, a preliminary estimation of the size of the canal can be made.

They have used 'canal-to-body ratio' in a retrospective analysis of 13 cases of lumbar spondylosis with syndromes varying from 'disc prolapse' to 'intermittent claudication', and plain radiography and myelographic findings have been reviewed in the light of operative findings and postoperative results. They felt that in those cases presenting with intermittent claudication that by preliminary assessment of canal size by plain radiography it is possible to differentiate between claudication due to narrowing of the canal and that due to peripheral arterial disease. Thus plain radiography may help to decide between myelography and arteriography as the appropriate investigation.

**THE FAILURE OF RADIATION THERAPY TO IMPROVE THE SURVIVAL PERIOD IN INTRACRANIAL GLIOMAS**

T. P. MORLEY (Toronto) presented a survey of all the cases of intracranial gliomas that had passed through the Toronto General Hospital from the inauguration of the neurosurgical service there—in the 1920's—until the end of 1965. Of the 1,376 total, 1,255 cases, verified and traced to death, formed the basis of the study. He stated that the purpose of the review was to investigate the effectiveness of radiation therapy when it had been used as an adjunct to surgical excision.

The variations in pathological type, site, stage of disease, clinical condition, extent of excision, and radiation therapy made significant comparisons between matching pairs impossible. Fortunately, however, the arbitrary opinion of each attending surgeon of the merit of radiation therapy provided a continuous and unchanging background of comparison between the radiated and non-radiated. Two surgeons did not favour radiation while the other three did. The comparison is shown in the first Table.

<table>
<thead>
<tr>
<th>Surgeon</th>
<th>Total cases (no.)</th>
<th>Post-operative radiation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>806</td>
<td>91</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>528</td>
<td>225</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>42.4</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

He felt that the fact that surgeons A and B asked for radiation in as many as 11% of their patients when they did not really believe in it was simply a reflection of their conscientious inability always to withhold it in the face of entreaties from patient, family, or referring physician. On the other hand, the main reasons that surgeons C, D, and E radiated only 42% of their patients was that the remainder did not survive to receive it or were judged so disabled by their disease that they were not suitable candidates.

The radiation techniques used were at the time regarded as orthodox and since the war have been based on Paterson's recommendations. With each succeeding decade the incidence of post-excisional radiation has increased, reaching 40% by the 1960's, as shown in the second Table.

<table>
<thead>
<tr>
<th>Period</th>
<th>Cases excised (no.)</th>
<th>Cases with completed post-operative radiation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920-29</td>
<td>13</td>
<td>23-0</td>
</tr>
<tr>
<td>1930-39</td>
<td>155</td>
<td>6-0</td>
</tr>
<tr>
<td>1940-49</td>
<td>249</td>
<td>20-0</td>
</tr>
<tr>
<td>1950-59</td>
<td>333</td>
<td>31-0</td>
</tr>
<tr>
<td>1960-65</td>
<td>201</td>
<td>38-0</td>
</tr>
</tbody>
</table>

Crude survival time from first symptom was chosen in preference to survival time from treatment. If allowance is made for those patients who were too ill to receive radiation or who died post-operatively, there is no significant difference in the survival curves of the radiated and the non-radiated.

The author is convinced that in one large centre the
management of gliomas has not been improved by the addition of post-operative radiation. A more detailed analysis of the material is in progress, but meanwhile he will, in collaboration with his colleagues, submit future patients to a prospective clinical trial to test the efficacy of contemporary radiation therapy.