The African Journal of MEDICAL SCIENCES

Volume 4

1973

BLACKWELL SCIENTIFIC PUBLICATIONS
Oxford London Edinburgh Melbourne

Afr. J. med. Sci. (1973) **4,** 289–292.

Experience with Meningiomas in the Transvaal African

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(*Received* 21 *April* 1972)

Summary. This contribution analyses clinical experience with fifty-three African patients who presented with neurological deficits due to supratentorial meningiomas. The clinical presentations, and the course following investigation and surgery are documented. It was noted that more than half the patients presented with severe neurological deficits associated with very large tumours, despite clinical histories of allegedly short duration. The morbidity and mortality attributable to surgery was low, but the gain in useful survival in those patients with large tumours was of dubious value. About 20% of the tumours showed malignant characteristics on histopathological examination, a figure higher than that encountered in Caucasian series.

Résumé. Cette contribution analyse l'expérience clinique obtenue après traitement de 53 malades africains, qui présentaient des déficits neurologiques dus à-des méningiomes sustentoriels. L'auteur fait état de l'aspect clinique et de l'évolution suivant l'examen et l'intervention. Plus de la moitié des malades présentant des deficits neurologiques sévères ont des tumeurs très larges, malgré l'histoire d'un recul de soit disant courte durée. La morbidité et la mortalité suivant l'intervention sont négligeables, mais la survie de ces malades aux grosses tumeurs n'est pas remarquable. Environ 20% des tumeurs ont des traits malis à l'examen histologique, un chiffre plus eleve que celui des groupes causasiens.

The pattern of presentation of tumours of the CNS in African patients differs from the textbook descriptions and experiences of the clinics of Europe and North America. The paucity of gliomas and virtual absence of acoustic neuromes in the Negroid population of the Transvaal, South Africa, has been documented previously (Froman & Lipschitz, 1970). This contribution discusses our experience with supratentorial meningiomas in fifty-three patients drawn from the same population previously described, during the years 1962–1971.

MATERIAL AND METHODS

Cushing (1962) stated that 'even an experienced eye and hand may be deceived by apparently

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enucleable tumours of other sorts that adhere to dura'. As the present investigation is directed at the pattern of behaviour of the meningioma in the African, and not at an assessment of absolute incidence, this survey includes only those patients in whom histological confirmation of diagnosis was obtained. Of the fifty-three cases, operative specimens were taken in fifty-one, and in two patients, necropsy examination confirmed the diagnosis. Patients who were thought to have meningiomas but for whom valid consent for surgery could not be obtained were not included in this series.

PRESENTATION

Of the fifty-three patients, thirty were male and twenty-three female. There was a wide age scatter, but most were in the third to fifth decade of life. Presentation with an obtunded level of consciousness was the rule, rather than the exception. Most patients complained (or had complained before being too obtunded to do so), of visual impairment, and no less than seventeen of the fifty-three patients had no useful vision at the time of admission to the neurosurgical unit. Bilateral optic atrophy consecutive to papilloedema with fundal changes often indistinguishable from the appearance of primary optic atrophy, was present in more than half the cases, and some fundal change was present in every case. Occasionally, proptosis was the reason for presentation. A history of epilepsy was obtained frequently. Many of the patients showed focal limb pareses. Facial pain, possibly due to indirect compression of the fifth cranial nerve was an occasional complaint. Sometimes the development of the meningioma was attributed by the patient to previous skull trauma, but we were unable to be sure of the relevance of this claim.

External scalp tumours were present in seven patients; in three, these lumps had been bloodily biopsied elsewhere, without prior recognition of the intracranial pathology. Skull radiographs almost always showed signs of longstanding raised intracranial pressure, and wide excavation of the pituitary fossa and compression of the sphenoid air sinus led to several referrals mistakenly labelled as pituitary tumours. Many of the radiographs demonstrated wide splaying of sutures even in patients well into adulthood. Despite the very obvious pattern of belated presentation with long-standing illness, more than half of the patients insisted that symptoms were of recent onset, and dated their illness in terms of weeks or months only.

INVESTIGATION AND SURGERY

Carotid angiography (occasionally supplemented by ventriculography or brain scan) was done in fifty-one patients, all of whom were then operated upon. One comatose patient died on induction of anaesthesia for angiography, and one patient, who had lapsed rapidly into coma following an unwise lumbar puncture, died before angiography. She had presented on the day of death in a mildly obtunded state after what was allegedly her first convulsion. Autopsy confirmed the presence of large supratentorial meningiomas in both these patients. Once angiography had indicated the size and site of the meningioma, it has been the policy of the unit to attempt surgical extirpation of the tumour in all cases. Initially, the staged procedures advocated by Cushing & Dott were utilized, but modern anaesthesia and blood transfusion have made this approach unwarranted. Irrespective of the size of the tumour, primary total excision was attempted, except in en-plaque tumours related to the sella turcica, or in some medial sphenoid masses which appeared anchored to the carotid arteries.

Cook (1971) has recently described a technique for extradural mobilization of such large medial sphenoid meningiomas, and we have used his method to advantage. Nevertheless, there have been two intra-operative deaths in this series, both associated with inadvertent rupture of the internal carotid artery during dissection of tumours intimately related thereto. With the exception of one patient who succumbed to a pulmonary embolus on the third day after operation, the remaining patients survived both the surgery and the acute post-operative phase.

RESULTS

'Statistics are dreary matters but it is periodically incumbent upon us to assess our cases not only for our own instruction lest we bury in obscurity our mistakes and bad results, but also to acquaint others with the standing of operative measures' (Cushing, 1969).

At the present time, of forty-eight patients who survived operation, six have returned to full employment and six are capable of selfcare. A group of eighteen patients have been returned to chronic care institutions because they remained obtunded, blind or paralysed months after surgical excision of their lesions, and most of these patients have since died. Eighteen patients died while in the neurosurgery unit 1–6 months after surgery. This is a bitter harvest for much surgical and nursing endeavour, and makes depressing comparison with the yield of Cushing 50 years ago. Further analysis shows that the cause for failure lies not in the surgery but in the pathology of the meningiomas in the African patients. Of the fifty-three tumours considered here, twenty-four were graded as 'global' or 'gigantic'. We applied these terms to tumours which occupied more than one whole cranial fossa (anterior, middle, supratentorial posterior, or sellar), and which extended liberally into a second. Sixteen of the fifty-three tumours were designated as 'large' tumours; that is, they at least occupied a whole fossa. Six of fifty-three tumours were medium sized, and only four tumours were smaller than a golf-ball in size. There were three en-plaque tumours while one of the giant meningiomas comprised a mass in one occipital pole, and an en-plaque extension which ran in continuity along the middle fossa floor and ended in a pigeon's egg-sized retro-ocular mass.

HISTOPATHOLOGICAL FINDINGS

The term 'malignant meningioma' was used in this series to denote those tumours in which histopathological examination showed numerous mitotic figures, areas of necrosis, and areas of neutrophil infiltration, and where the rapidity of the clinical course confirmed the histopathologist's opinion. No fewer than eight of the fifty-three patients had tumours of this nature. One further patient included in this series presented with a middle fossa mass which was diagnosed histopathologically as a fibroblastic meningioma. He reappeared 3 months later with a secondary deposit in the chest wall. Biopsy of the latter mas was diagnosed as a spindle cell tumour suggestive of a leiomyosarcoma. This patient has been included in this series in the light of Russell & Rubenstein's (1971) comment on a similar case. One other patient's mass lesion showed variegated areas on section, portions of which showed whorling indicative of meningioma, while other portions tended to resemble oligodendroglioma, while there were a sufficient number of mitotic figures to indicate a malignant diathesis. Thus ten of fifty-three patients had soft tissue tumours with malignant characteristics—this high incidence is in keeping with the propensity of the African to

develop other rapidly advancing mesodermal tumours such as the fibrosarcomas and rhabdomyosarcomas. The other forty-three tumours were unremarkable on section.

CONCLUSIONS

The Negroid African patients considered in this series presented for treatment with meningiomas that were invariably large or even gigantic in size. Cushing (1962), in reference to tumours in excess of 300 g, writes, 'global tumours of this size could occur only in young subjects with a distensible skull or in adults after large decompressions have been made'. It has been our experience that such large tumours can indeed present in adulthood at an age when, theoretically, sutural splaying should not occur, and that such tumours have a capacity for making space for themselves by widening of these very sutures, by extensive erosion of the pituitary fossa, and by thinning and expansion of the cranial vault. The brief duration of symptoms admitted by the patient is apparently inconsistent with the size of the tumours. Cushing (1962) observed that 'in certain silent or comparatively silent regions of the brain the lesion may reach an amazing size before any suspicions of its presence either on subjective or objective grounds are aroused'. We feel, however, that our patients simply present to hospital belatedly, and that either our patients' concepts of time in relation to their symptoms is unreliable, or remotely, these tumours progress at a rate unsuspected heretofore. We also suspect that there is an increased incidence of the malignant variety of meningioma in the African group when compared with Caucasians.

The surgery of the mass lesion is now undertaken with little intraoperative mortality, and little morbidity attributable to the surgery, but this does not cure the neurological deficit which exists at the time of presentation. In fact, those patients who presented obtunded, euphoric, hemiplegic, and blind, were rendered alert, emotionally aware and depressed, hemiplegic and blind. This is a dubious gain. Thus surgery of large and giant meningiomas represents a technical feat, but its therapeutic value is questionable. The solution to the problem lies in inculcating an awareness of early symptomatology, early physical signs and radiographic changes in the students in our medical schools today, and a diminution of teaching accent which still tends to harp on the gross, the burnt-out, and the obvious. If such teaching is coupled with a wider dispersion of medical personnel, we may be able to return our surgical endeavour to more useful ends.

REFERENCES

Cook, A.W. (1971) Total removal of large global meningiomas at the medial aspect of the spenoid ridge. Technical note. *J. Neurosurg.* **34**, 107–113.

Cushing H. (1962) In: *Meningiomas.* Harper Publishing Company; New York.

Cushing, H. (1969) In: *Selected Papers on Neurosurgery.* Yale University Press, New Haven and London.

Froman, C., & Lipschitz, R. (1970) Demography of tumours of the central nervous system among the Bantu (African) population of the Transvaal, South Africa. *J. Neurosurg.* **33**, 660–664.

Russell, D.S., & Rubenstein, L.J. (1971) In: *Pathology of Tumours of the Nervous System*, 3rd edition. Edward Arnold, London.