



Metastatic tumours of the brain and its enveloping structures in Ibadan, Nigeria

A. ADELOYE, E. L. ODEKU AND A. O. WILLIAMS*

*Neurosurgery Unit, Department of Surgery and * Department of Pathology, University College Hospital and University of Ibadan, Ibadan, Nigeria*

Summary

Fifty-two cases of secondary tumours of the brain and its enveloping structures which were encountered at the University College Hospital (UCH), Ibadan, Nigeria between January 1965 and December 1970 are reported. All lesions were histologically verified, forty-six at autopsy and the remaining six from biopsy specimens of the skull deposits. There were forty females and twelve males; 77% of the subjects were in the third, fourth and fifth decades of life, 15% in the sixth and seventh, and the rest in the first two decades. Thirty-four of the metastases were found in the substance of the brain and the remaining eighteen in its enveloping structures (the scalp, skull and dura-mater). Of the thirty-four brain secondaries, twenty-four (70%) originated from chorion carcinoma of the uterus, six from the lungs and two each from the breast and kidney. Metastases to the skull came from many sources—cervix, uterus, prostate, adrenals, liver, bladder, colon and the thyroid gland. Of the later group, follicular thyroid carcinoma was the commonest single source of secondaries.

Résumé

52 cas de tumeurs secondaires du cerveau et de ses enveloppes, survenus à l'UCH d'Ibadan (Nigeria) entre janvier 1965 et décembre 1970 sont rapportés. Toutes les lésions ont été histologiquement vérifiées, 46 à l'autopsie et 6 par biopsie de prélèvements des dépôt du cuir chevelu. 40 étaient des femmes et 12 des hommes. 77% des malades avaient entre 20 et 50 ans, 15% entre 50 et 70 ans et le reste de 0 à 20 ans. 34 des métastases ont été trouvées dans le cerveau et les 18

Correspondence: Professor A. Adeloye, Neurosurgery Unit, Department of Surgery, University of Ibadan, Nigeria.

autres dans ses enveloppes (cuir chevelu, crâne, dure-mère). Sur les métastases du cerveau, 24 (70%) provenaient d'un cancer du chorion de l'utérus, 6 des poumons, 2 du sein et 2 du rein. L'origine des métastases du crâne étaient très diverse: col, utérus, prostate, surrénales, foie, vessie, colon, glande thyroïde. Dans ce second groupe, le cancer de la thyroïde était la source unique la plus fréquente.

Introduction

This is an account of the clinico-pathological manifestations of fifty-two cases of metastatic tumour deposits of the brain and its enveloping structures which we came across at the University College Hospital (UCH) Ibadan, Nigeria between January 1965 and December 1970.

All the lesions were histologically verified, forty-six were examined at autopsy and six patients with skull deposits had biopsies of their skull masses. The brain was routinely removed when autopsy was performed, and in each case it was fixed for about a month after which it was examined. Appropriate specimens for histology were then removed from the brain and other relevant organs. The six patients who had biopsies of skull masses included four with follicular thyroid carcinoma, a man with prostatic cancer, and a middle-aged woman in whom the histological nature of the lesion was not definitely established. In the entire series, histological specimens, whether obtained from autopsy or by biopsy were routinely stained with haematoxylin and eosin.

Findings

General

During the period covered by the survey, 594

Nigerians who died from primary malignant tumours arising outside the central nervous system were examined at autopsy at UCH, Ibadan. Forty-six of them had metastases to the brain and its enveloping structures, an incidence of 6.6%.

Age incidence

The youngest subject in this series was a male child of 9 months with abdominal neuro-blastoma with deposits in the skull and dura-mater, and the oldest was a male farmer of 68 years with cancer of the colon with multiple lesions in the skull. Seventy-seven per cent of the subjects were in the third, fourth and fifth decades of life, 15% in the sixth and seventh and the remaining 8% in the first two decades of life.

Sex incidence

Seventy-seven percent of the subjects were females. This sex bias was particularly pronounced among the group of thirty-four subjects with tumour deposits in the brain where all but three were females. The sex distribution was equal among those with tumour deposits in the coverings of the brain.

Site of primary malignant tumour

Of the thirty-four examples of intracranial (cerebral and cerebellar) tumour deposits, twenty-four came from chorion carcinoma of the uterus, six from the lung and two each from the breast and kidney.

The sources of the primary malignant tumours with deposits in the coverings of the brain were more widespread and comprised neuroblastoma, chorion carcinoma of the uterus, carcinoma of the cervix, prostate gland, liver, bladder, colon and the thyroid gland. Pre-eminent in this group was follicular thyroid carcinoma which was the commonest source of skull deposits in the series (Table 1).

Cranial and intracranial location of the tumour deposits

The cranial deposits were commonly multiple and most of them involved the parietal aspects of the head, less often the frontal and occipital and the least involved was the temporal.

Table 2 shows the location of intracranial tumour deposits, the most favourite site in order of frequency

TABLE 1. Sites of primary tumours

Site	Frequency
Metastases to the brain	
Chorion carcinoma	24
Lung carcinoma	6
Breast carcinoma	2
Kidney carcinoma	2
Total	34
Metastases to coverings of the brain	
Thyroid carcinoma	5
Bladder carcinoma	3
Prostatic carcinoma	2
Hepatoma	2
Neuroblastoma	2
Colonic cancer	1
Chorion cancer	1
Carcinoma of cervix	1
Undetermined	1
Total	18

TABLE 2. Intracranial location of metastases

Site	Frequency
Parietal	13
Occipital	9
Frontal	6
Temporal	3
Basal ganglia	3
Cerebellum	3
Pituitary	1

being the parietal, occipital and frontal regions. There were more solitary deposits than multiple ones, and about 80% of the lesions were in the supratentorial compartment of the intracranial cavity.

Clinico-pathological presentations

Intracranial tumour deposits

The appearance of neurological manifestations in a patient with malignant disease often spelt a uniformly poor prognosis. Mental confusion, headaches, convulsions and neurological deficits were the commonest neuro-psychiatric manifestations of intracranial metastases.

Chorion carcinoma of the uterus is the commonest source of cerebral metastases in this series. A highly vascular lesion, it commonly presents like an acute cerebrovascular disease, and less often, as acute encephalitis or as a 'primary' space-occupying lesion.

when it may be the first evidence of systemic chorion carcinoma.

Cranial tumour deposits

These masses are often multiple and painful, and they progressively increase in size. When of long duration the tendency is for the swelling to break down and develop into a fungating mass. On the other hand, it may break through the calvarium and invade the intra-cranial cavity, usually the extradural compartment. The latter feature is exemplified by the case report given below.

Case 1. K.H., a 2-year-old girl from Patani in the River State was first seen at UCH on 13 April 1970 with 3 months history of a swelling over the right anterior aspect of the head. There was no history of trauma. The mass which measured 7 cm by 5 cm was soft, non-tender, non-pulsatile, but rather fluctuant and occupied the right frontoparietal area. Skull radiographs showed extensive mottled translucent areas in the frontal region raising the possibilities of osteomyelitis or haemoglobinopathy. Her genotype was later found to be AA; the swelling gradually increased in size and more lesions appeared in the occipital region. By the middle of May, there was clinical evidence of hydrocephalus and the child was admitted on 25 May 1970 for further investigations.

Biopsy of the skull mass revealed metastatic neuroblastoma. She was treated with appropriate chemo-

therapeutic agents, but the cranial mass and the hydrocephalus increased progressively until the child died on 21 August 1970. Autopsy revealed the presence of abdominal neuroblastoma and the skull deposit had penetrated into the extradural space of the intracranial cavity.

Skull deposits from thyroid carcinoma presented unusual features. They were the commonest form of metastatic tumour deposit in the skull in this series in which they were encountered in four females and in one male. In two patients the head swellings were the first presentation of thyroid cancer; in the other three, skull deposits appeared at varying periods after thyroidectomy. In one patient in the latter category, the malignant nature of the goitre removed was revealed after biopsy of the skull metastasis which occurred 6 years after thyroidectomy.

All the tumours were of the well-differentiated follicular variety. The patients have a uniformly remarkable capacity for long survival, so that the skull deposit can reach an enormous size.

Case 2. AA., a 42-year-old Ibadan woman was first seen here in 1970 with a huge left parieto-occipital swelling of 5 years' duration (Fig. 1). She had a thyroidectomy in 1964 for a clinically simple goitre, but histological examination revealed that she had follicular thyroid carcinoma. In 1965, she developed a left parieto-occipital mass which slowly increased in size, and which was painful only when touched. The mass was pulsatile, but had no bruit. Common



FIG. 1. Patient with left parieto-occipital skull deposit from follicular thyroid carcinoma.



FIG. 2 The same patient 3 months later. Note left-sided proptosis.

carotid angiography demonstrated normal intracranial circulation and very prominent extracranial vessels around the parieto-occipital mass.

Later in 1970, she developed a left-sided proptosis (on the same side as the head swelling) which became more marked with time (Fig. 2). She did not show features of hyperthyroidism and tests of thyroid function were not performed.

This triad of follicular thyroid cancer, metastases to the skull from the same, and the subsequent develop-

ment of proptosis on the same side of the head swelling was also noted in a woman of 47 who had thyroidectomy in 1963. Histological examination then did not indicate malignancy: in 1969, she developed swelling of the head followed within months by proptosis, and biopsy of the skull mass revealed metastatic follicular thyroid carcinoma.

Comment

The reported frequency of metastatic tumours of the brain has been variable, depending on the type and source of materials studied. This series has been compiled from autopsy and clinical materials in a teaching hospital with a bed capacity of 510. To give a global picture of the problem, metastatic tumour deposits in the enveloping structures of the brain have been included since patients with unusual skull masses often invite neurosurgical consultation. While it appears that any malignant tumour can metastasise to the skull, the follicular type of thyroid carcinoma is the commonest source of such secondary tumours at Ibadan. Although the association of hyperthyroidism and thyroid carcinoma is known (Georgiadis, Leoutsakos & Katsas, 1971), no good explanation is yet available for the observed occurrence of ipsilateral proptosis in our patient with metastatic thyroid cancer.

This study, however, re-emphasises our previous finding (Adeloje & Odeku, 1969) that most of the metastases to brain at Ibadan, Nigeria, originate from chorion carcinoma of the uterus.

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