this does not explain why spasticity occurs at once, and indeed its occurrence is so immediate that it must be related directly to the injury rather than to the secondary pathological changes following a sinus thrombosis. In cases where operative procedure was necessarily severe a stage of shock and flaccid paresis did appear, but ten days or so after operation spasticity had again appeared, often together with the first signs of recovery.

Recovery begins early and continues for a considerable time—several years at least. Its degree depends upon the degree of injury, and if this is severe spasticity and weakness remain and recovery depends upon how much this can be overcome by re-education in walking and the use of appliances. The main difficulty that these patients experience is the negotiation of uneven surfaces and inclines that require the presence of unimpaired postural sensibility in the toes and the ability to dorsiflex and plantar-flex the foot accurately. In the early stages of recovery the gait may be likened to that of a patient suffering from Little's disease, but most cases appear to progress enough to afford adequate movement at the hips and knees, and the residual disability is confined in these cases to the feet and ankles.

Furthermore, although the series is small, the presence of other symptoms often associated with cranial injury do not seem to be of common occurrence—that is, such symptoms as headache, dizziness, or epileptiform attacks.

Summary

A series of cases of injury in the region of the superior longitudinal sinus is presented.

The clinical picture is described and the pathology briefly discussed.

Particular attention has been paid to the clinical progress of the cases and their condition up to four years after injury.

The very early occurrence of spasticity after the injury is also emphasized.

I should like to thank Mr. Wylie McKissock for permission to study and follow up these cases, and Dr. J. E. S. Lloyd for permission to publish this paper. I should also like to thank Miss Montgomery for her help in contacting the cases.

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Under the National Insurance (Overlapping Benefits) Provisional Regulations, 1948, certain reductions are made in the rate of benefit payable to in-patients who are maintained free of charge in hospital. These provisions have thrown into relief the question of the extent to which hospitals should provide their patients with the non-medical necessities of life and with minor luxuries. There are certain articles which the Minister considers should be provided as a matter of course for all patients who do not prefer to provide their own—such things as soap, tooth paste or powder, razor blades, sanitary towels or their equivalent, the services of a barber, a reasonable supply of notepaper on request, and a selection of newspapers and magazines in the wards (though not an individual issue). Other articles may be supplied to patients on loan—e.g., towels, hairbrushes, and combs, and, where necessary, night and day clothing. It is not easy to distinguish between essentials of this kind and minor luxuries, or, in other words, between what should be provided at the cost of the Exchequer and what may be provided from the committee's or board's free money; and the Minister leaves committees and boards a certain discretion in determining this issue. He considers, however, that hospitals should not provide as a charge on Exchequer funds such things as cosmetics, permanent waving, postage stamps, and tobacco or sweets. Where patients remain in hospital for a long time it is reasonable that the range of articles to be provided without charge and at Exchequer cost should be somewhat extended.

A CASE OF BILATERAL PHAEOCHROMOCYTOMA

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Phaeochromocytomata are rare enough to warrant the recording of an additional case.

Case Report

The patient, a married woman aged 40, was admitted in October, 1946, complaining of generalized throbbing headaches for the past ten years. These were present by day and by night, but had increased in severity during the past two years. Sometimes after exertion or on stooping the headaches became very severe, spreading from the temporal and infraorbital regions to the vertex and occiput. These attacks lasted for two to three minutes, but the patient emphasized that she was never completely free from headaches. On moderate exertion she soon became breathless and suffered from palpitations. Weakness and loss of weight had increased, particularly during the three weeks before her admission. Her past history had been uneventful. Her family history was very interesting.

Her father died at 46 of Addison's disease, though its cause (atrophy, tuberculous infection, chromaffinoma) is debatable. Of six other siblings, one brother died at 28 of diabetes, while one sister died at 29 of an obscure bone disease. She was apparently healthy up to the age of 14, when she started to "shrink." At the time of her death her body was about the size of a child of 4. The condition was regarded as that of an "achondroplastic dwarf."

Physical Examination.—The patient looked very much older than her age. Pigmentations were not present on skin or mucous membranes. There were visible arterial pulsations in the anterior cervical triangles and in the suprasternal notch, and the apex beat was forcible. The pulse was regular, but there was a tachycardia of 140. The blood pressure was raised to 227/128. The blood urea was 65 mg. per 100 ml. Hyaline casts were constantly found in the urinary sediment, and a moderately large tumour which did not move with respiration could be felt in the right lower abdomen. Both fundi of the eyes showed sparse, scattered, superficial retinal haemorrhages of moderate size in the paracentral areas. One vein below the left optic disk appeared to be compressed by the overlying artery.

X-ray Examination.—The ascending pyelogram showed that the right kidney corresponded to the tumour felt by abdominal palpation and was found to be rotated forward, outward, and displaced downwards. Both kidneys were secreting. The left kidney was normal in appearance and position. Above the right kidney there was a dense shadow, and a new growth of the right adrenal gland was thought to be most likely.

A presumptive diagnosis of chromaffinoma of the right adrenal gland was made and operation was decided upon. Under N_2O–ether anaesthesia the right lumbar region was explored and a large adrenal tumour removed. During the operation it was noted that both pupils became maximally dilated as soon as the tumour was handled. Post-operatively the patient was immediately treated for shock, adrenaline was given, but in spite of this she did not rally and death occurred within 24 hours.

At necropsy the *left adrenal gland* appeared to be also grossly enlarged, weighing 40 g. In parts the usual shape of an adrenal gland was still recognizable, but a large round tumour mass occupied the central portion of the gland. On sectioning, normal yellow cortical tissue was only sporadically recognizable. For the greater part the whole organ and round mass consisted of soft yellowish or dark brown jelly-like material. The *right*

adrenal gland, removed at operation, weighed 325 g. and consisted of two distinct masses, held together by a flat, broad pedicle. The smaller of the two, still resembling in shape an adrenal gland, measured 6½ by 4 by 3½ cm. The larger mass was oval, measuring 10½ cm. across and 7½ cm. in width. The tumour was surrounded by a thin fibrous capsule and was moderately firm. On sectioning, the cut surfaces were whitish or yellowish brown in colour, but there were many areas of haemorrhagic infiltration as well as areas of cystic degeneration.

Microscopically both tumours appeared to be composed of strands and masses of fairly large somewhat pleomorphic cells, possessing an oval or round vesicular nucleus, displaying a delicate chromatin network and exhibiting a distinct nucleolus, surrounded by a fair rim of basophil cytoplasm, and often forming syncytium-like complexes. They were supported by scanty stroma and often surrounded blood sinusoids. At the periphery the tumour cells occasionally resembled normal adrenal medullary tissue. They stained dark brown after fixation in potassium bichromate solution. The diagnosis was chromaffinoma.

Discussion

Phaeochromocytoma, or chromaffinoma, is a comparatively rare tumour. Up to 1946 about 176 had been recorded, of which only 47 showed hormonal activity (Calkins and Howard, 1947). Among these there were 16 bilateral growths (Mackeith, 1944), so that the present case is probably the 17th.* Every year several new cases are recorded (Espersen and Dahl-Iversen, 1946; Washington *et al.*, 1946; Blacklock *et al.*, 1947; Brunschwig, 1947; Goldenberg *et al.*, 1947; Gutmann, 1947; Kipkie, 1947; Mandl, 1947; Schneider, 1947; Spalding, 1947). The symptoms, though essentially those of hypertension due to an excess of adrenaline production, may vary, and some authors distinguish four clinical groups: (1) paroxysmal hypertension, (2) persistent hypertension, (3) asymptomatic, and (4) malignant. A fifth and very rare manifestation is Addison's disease due to compression of the adrenal cortex by the new growth. In addition to the signs and symptoms of hypertension, including haemorrhages in the eyes and partial or complete compression of the retinal veins by their corresponding arteries, anaemia, loss of weight, lassitude, insomnia, fibrillation, and hyperglycaemia and glycosuria have been observed.

Chromaffin tumours may arise from chromaffin tissue throughout the body, but do not appear to give rise to clinical symptoms unless situated in or in close proximity to the adrenal glands (Mackeith, 1944).

Apart from the history and abdominal palpation, *x*-ray examination is of help in diagnosis. Tomography revealed the presence of a growth in one case (Mandl, 1947). Perirenal insufflation of air is recommended by several authors. A rise of the serum potassium during hypertensive paroxysms was described by Blacklock *et al.* (1947), while others found an increased content of adrenaline during the attacks (Beer *et al.*, 1937; Strömbeck and Hedberg, 1939).

Recently two new tests have been devised which may prove most helpful in diagnosing the condition. Goldenberg *et al.* (1947) postulated that in a case in which hypertension is due to an increased amount of adrenaline it will be abolished or significantly decreased by the intravenous administration of adrenolytic compounds. But if hypertension is due to any other cause it will persist. The two adrenolytic benzodioxanes they employed (933 F: piperidylmethyl benzodioxane; and 1164 F: 2,4-dimethyl-piperidylmethyl benzodioxane) were injected in a dosage of 0.2–0.25 mg. per kg. of body weight, and proved their assumption right. The injections were followed by a *fall* in blood pressure of about 50 mm., which effect lasted for about 15 minutes—a reaction which proved to be specific for an increase of adrenaline in the circulation.

The second test was developed by Roth and Kvale (1945), based on experiments by Hyman and Mencher (1943), who also claim that their test is specific for the condition. The intravenous injection of 0.025–0.05 mg. of histamine in 0.025–0.05 ml. of saline into patients suffering from a chromaffinoma was followed immediately by a *rise* in blood pressure of about 100 mm. or more, accompanied by the subjective sensations of a typical attack of hypertension. Though one might be tempted to explain this phenomenon as the reaction of the body to a vasodilator, this is apparently not the mechanism, as dilatation of vessels as such does not produce a similar reaction. Hyman and Mencher's theory is that the drug exerts an immediate action on the tumour cells, causing them to shed their hormone into the blood stream.

Up to date no medical treatment of the condition is available, unless the observation by Espersen and Dahl-Iversen (1946) can be corroborated. They treated one of their cases pre-operatively with methylthiouracil, which resulted in complete disappearance of the paroxysmal attacks of hypertension.

The new growth has been attacked over 50 times, and in many cases successfully, by surgical intervention. The most critical period is the first 24 hours after operation. Many substances have been advocated to combat the ensuing shock, of which adrenaline in large doses proved the most successful (Biskind *et al.*, 1941).

Calkins and Howard (1947) described the first two cases of familial bilateral phaeochromocytomata, occurring in a woman and her niece. They were of the opinion that there is every likelihood that the mother of the latter also died of the same disease. A remarkable incidence of goitre was shown to exist in this family. In this connexion it may be stressed that the family of our patient also showed evidence of endocrine imbalance, but none of its members suffered from thyrotoxicosis.

We gratefully acknowledge our indebtedness to our colleagues, Drs. Hale, Hair, and Heath, for permission to make use of their case notes.

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*A further case of bilateral chromaffinoma, occurring in a child, was demonstrated by Dr. H. S. Baar at a meeting of the Association of Clinical Pathologists, held at St. Mary's Hospital on Jan. 23 and 24, 1948.

The Minister of Heath is considering the question of the recruitment and training of matrons and assistant matrons in homes for old or infirm people provided by local authorities and voluntary organizations under the National Assistance Act, 1948. The Ministry announces that the National Old People's Welfare Committee will hold a course on Sept. 11–17 for training existing staff and with a view to selecting suitable matrons with whom future students might be placed for training. Inquiries should be made before July 5 to the secretary, National Old People's Welfare Committee, 26, Bedford Square, London, W.C.1.