PRIMARY HYPERPARATHYROIDISM (ADENOMA) SIMULATING SARCOIDOSIS

REPORT OF A CASE

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Although both primary hyperparathyroidism and sarcoidosis are uncommon disorders of different aetiology, there may be a close correspondence between their clinical manifestations. The following case indicates the difficulties that may arise in differentiating the two conditions.

Case Record

A married woman aged 33 was admitted to St. George-in-the-East Hospital in May, 1950, with a provisional diagnosis of subacute rheumatism. She had had three normal confinements, her last four months previously; this was uneventful, although lactation had ceased after four weeks. During the antenatal period she had taken a multiple vitamin preparation as a clinic routine, but no extra calcium or excess of milk.

For several years she had complained of nocturnal pains in her limbs and back which had become more persistent and severe since the last confinement. During the past three weeks she had noticed swelling of her ankles at night, frontal headaches, palpitations, slight constipation, and a loss of 7 lb. (3.2 kg.) in weight. There was no history of dyspepsia, thirst, polyuria, or fracture.

She was a pale, thin woman with a congenital absence of the left wrist and hand. Her height was 5 ft. 6½ in. (169 cm.); weight 133½ lb. (60.5 kg.); resting heart rate 90 a minute; blood pressure 140/80. The right lobe of the thyroid was slightly more prominent to sight and touch than the left. There was slight injection of both conjunctivae, and a fine leash of subconjunctival vessels was visible on

both nasal and temporal sides of the palpebral fissure, associated with minute crescentic opacities at the limbus.

Investigations.—Blood examination showed: red cells, 3,500,000 per c.mm., with slight anisocytosis; Hb, 63% (9.3 g%); C.I., 0.9; white cells, 7,900 per c.mm., with a normal distribution; corrected E.S.R., 24 mm./hour (Westergren). A catheter specimen of urine was alkaline and showed a light cloud of albumin; the deposit contained epithelial cells, and a few leucocytes and red cells. Culture was sterile. The chest radiograph (Fig. 1) was reported on as follows: "The lungs are excessively streaky, apparently on account of some generalized fibrosis. The root shadows are only slightly prominent. The heart is normal in size and shape. The lungs do not appear to show infiltration." Report on a film of the right hand was as follows: "There is a large area of rarefaction in the head of the proximal phalanx of the index finger. Query the possibility of sarcoidosis" (Fig. 2). Plasma proteins: total, 6.7 g./100 ml., albumin

FIG. 2.—Radiograph of right hand and left stump, showing punched-out area of rarefaction in the distal end of the first phalanx of the index finger. Smaller areas are seen in the middle and ring fingers.

4.3 g./100 ml., globulin 2.4 g./100 ml.; albumin/globulin ratio 1.8/1. Serial sputum tests and gastric lavage were negative for tubercle bacilli, and the Mantoux reaction was negative at 1/1,000.

The chest film was reviewed, and the coarse trabeculation and radiolucence of the thoracic cage were now noted. The possibility of generalized skeletal decalcification with metastatic calcification of lungs and cornea was now apparent, and a presumptive diagnosis of hyperparathyroidism was made. The diagnosis was confirmed by the following investigations: serum calcium, 16 mg./100 ml.; plasma inorganic phosphorus, 4 mg./100 ml.; blood urea, 70 mg./100 ml.; serum alkaline phosphatase, 14 King-Armstrong units. Intravenous pyelography showed considerable calcification in both renal areas and impaired excretion of dye (Fig. 3). X-ray examination showed slight generalized rarefaction of all the bones of the skeleton, including the skull (Fig. 4). A barium swallow showed no abnormality.

The patient was transferred to the East Ham Memorial Hospital under one of us (H. W. S.), for surgical exploration by Mr. A. J. Heriot. Renal function tests made before operation showed gross impairment: urea clearance, 17% of average normal, with a blood urea of 92 mg./100 ml.; water dilution and concentration tests showed correspondingly low values.

Operation was performed on November 20 at a serum-calcium level of 16 mg./100 ml. (anaesthetist, Dr. A. Marsden). A normal-sized thyroid gland was disclosed with the right lobe displaced forwards by a tumour one-and-a-

FIG. 1.—Radiograph of chest showing heavy hilar shadows, diffuse streakiness of lung fields, peripheral reticulation, and slight osteoporosis of ribs.

half times the size of a normal thyroid lobe, lying alongside the oesophagus and on the vertebrae. It was nodular, greyish yellow in places, and had no definite vascular connexions with the thyroid. The tumour was encapsulated; it measured 5.5 by 3.5 by 2.5 cm. (Fig. 5) and weighed 17.5 g. Histologically it was an adenoma of the parathyroid gland.

Post-operative tetany was aborted by giving intramuscular calcium gluconate when indicated clinically or by the Sulkowitch test and serum-calcium level (see Table I).

The patient was discharged from hospital on December 13, 1950, symptom-free and with a normal serum calcium. Although renal damage remained as a constant hazard, her blood urea had fallen to 50 mg./100 ml. and there was no albuminuria. The lungs showed radiographic evidence of clearing and there was no macroscopic evidence of ocular pathology.

FIG. 3.—Radiograph showing calcification in both kidneys.

FIG. 4.—Radiograph of skull showing finely granular ground-glass appearance.

Discussion

This case conforms to the accepted aetiological pattern of hyperparathyroidism as regards age, sex, and the insidious nature of the symptoms. The factor of pregnancy has been correlated with the raised female incidence (3 to 1, Norris, 1947) on the grounds that a tendency to low serum-calcium levels promotes hyperplasia of the parathyroids, and thus might lead to adenoma formation (Albright and Reifstein, 1948). That sarcoidosis might be confused with hyperparathyroidism is mentioned by Harrel and Fisher (1939) in their study of 11 cases of Boeck's sarcoid; in six cases the serum calcium was definitely raised (highest 14.8 mg./100 ml.), the blood phosphatase was raised in every case, and eight cases showed the presence of bone cysts or trabeculation of the fingers; on the other hand, the blood inorganic phosphorus was always normal, and there was definite hyperproteinaemia (above 8 mg./100 ml.) in eight cases, with reversal of the albumin/globulin ratio in all cases during the active phase. A remarkable case that illustrates the occasional similarity between the two conditions is recorded by Albright and Reifstein (1948), who state: "Since there may be bone changes, high serum phosphatase levels, hypercalcaemia, hypercalcuria, and kidney stones associated with Boeck's sarcoid, this condition may in rare instances be mistaken for hyperparathyroidism."

Walsh and Howard (1947) describe ocular lesions of two types, identifiable by slit-lamp only, that were observed in patients with hypercalcaemia. In one type glass-like particles were seen in the conjunctiva of the palpebral fissure area; the other type was similar to band keratitis with hazy corneal deposits running concentrically with the limbus on either the nasal or the temporal side, or both. It is interesting to note that they found these lesions in two cases of sarcoidosis. Further details of these cases are given by Cogan, Albright, and Bartter (1948), who describe what they call band keratopathy and calcification of the conjunctiva in 18 cases of hypercalcaemia, four of which were due to hyperparathyroidism and two to sarcoidosis. The changes were visible to the naked eye and were analogous to nephrolithiasis or so-called nephrocalcinosis, which was present in many of the patients. In Scadding's (1950) series of 16 cases of sarcoidosis, 13 of which were confirmed by histological evidence, the variety of lung changes commonly found is described.

The chest radiograph of our case (Fig. 1) combines many of the radiographic features of pulmonary sarcoidosis. We feel that the possibility of hyperpara-

FIG. 5.—Parathyroid adenoma.

TABLE I.—Tests Employed to Detect Post-operative Tetany. It will be noted that the results of the Sulkowitch test bear no relation to the serum calcium estimations. (The arrows denote time at which injections were given)

Nov.:	19	20 Operation	21	22	23	24	25	26	27-30
Serum Ca mg./100 ml. . .		16	14	7	9	13			10-10
Sulkowitch:									
Cloudy	+	+++	+++	+++	++	++	++++	++	++
Clear					++	++		++	++
Ca gluconate 10 ml. 10% . .				↑	↑↑	↑↑	↑	↑	

thyroidism with metastatic calcification of the lungs should be entertained whenever sarcoidosis cannot be confirmed by tissue biopsy. The risks of hypercalcaemia, etc., as a result of calciferol treatment of sarcoidosis would appear to support this contention.

The significant points of correspondence in hyperparathyroidism and sarcoidosis are best illustrated by reference to Table II. The value of serum-protein estimation as an aid to differentiation may be clearly seen.

TABLE II.—*Indicating the Close Correspondence that May Occur Between the Findings in Hyperparathyroidism and Sarcoidosis. For Details see Text*

	Hyperparathyroidism	Sarcoidosis
Bone Changes	Generalized decalcification, cystic areas, or nil	Localized decalcification, cyst-like areas in bones, of hand, feet, and occasionally spine, or nil
Serum calcium	Generally raised	May be raised
Serum phosphorus	Low—except with retention by damaged kidneys	Usually normal; may be raised by associated renal changes
Alkaline phosphatase	Raised, with bone changes	May be raised (liver, etc.)
Serum proteins	Normal or low. A./G., normal	Raised; hyperglobulinaemia. A./G., inverted in active phase
Urine	Hypercalcaemia and albuminuria may occur in both disorders	
Kidneys	Metastatic calcification or stones	Sarcoid lesions or associated stones
Heart	Similar cardiographic changes are described	
Lungs	Radiographic similarity may occur	
Eyes	Metastatic calcification and band keratopathy may occur	

Summary

A case of primary hyperparathyroidism due to adenoma is described.

The apparent similarity between the findings in this case and those occasionally encountered in sarcoidosis is emphasized from the point of view of diagnosis.

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According to a report in the *New York Times* (December 3) the Automobile Club of New York stated recently that each year about two million American youths reach the driving age and only about one in every eight is properly taught to drive. In an effort to reduce the death rate on the roads many high schools and civic organizations have set up free driving clinics for students. They are taught both how to drive and the laws of the highway, together with the reasoning behind them. Unfortunately, however, says the article, there are far too few of these schools, and the great majority of these young drivers depend upon the guidance of friends or parents, who teach them just enough to gain a driving licence and no more. If, on the other hand, they can be persuaded to participate in a group plan that is really conducive to road safety, then a great step towards lessening the number of avoidable accidents would be achieved.

MONOCYTIC LEUKAEMIA AND PULMONARY TUBERCULOSIS COMPLICATING PREGNANCY

BY

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In view of its rarity the following case is considered worthy of record. Williams (1948) first reported a case of acute monocytic leukaemia and pregnancy, the patient (aged 35) dying within 12 days of caesarean section. Two cases of monocytic leukaemia and active tuberculosis have been reported (Heller and Hiles, 1946). In one of their cases, that of a man aged 70, there was no evidence that the leukaemic infiltration had been associated with reactivation of the tuberculosis, which involved the pleurae, pericardium, lymph nodes, and the lumbar region.

Case History

The patient was a married woman aged 25. Her father died of tuberculosis in 1933. Symptoms of pulmonary tuberculosis developed in January, 1947, and after the birth of her first child in April she became acutely ill and febrile, extensive active bilateral cavitated disease being shown by x-ray examination. In May the sputum was positive. She improved steadily on streptomycin, which was discontinued in September (244 g. in 122 days). The disease remained quiescent.

She became pregnant again in 1948, and was admitted to the Grove Park Hospital antenatal unit on September 14, when slight hypertrophy of the gums was noted. These became markedly swollen and spongy by September 25, and the haemoglobin had by then decreased from 12.5 to 8.4 g.%. There were 29,800 white cells per c.mm., with 11,600 monocytes, and monocytic leukaemia was diagnosed. A blood transfusion of 6 pints (3.4 litres) of packed cells was given. On November 6 she was delivered normally of a healthy female child, with a blood loss of 15 oz. (425 ml.). The gums then became almost normal and all the white cells returned to a normal figure, except the monocytes, which remained at 2,000–3,000 per c.mm. Her condition remained good, but within five weeks of delivery sputum culture showed tubercle bacilli, although there was no radiological change.

At the end of February, 1949, the leucocytes began to increase rapidly, and by the middle of April they numbered 26,000. In early May, after a mild "coryza," she became much worse. The gums swelled again and developed purplish "granulomatous" masses. The left tonsillar gland was enlarged and tender. The spleen could not be palpated. By the middle of May the total leucocyte count was 96,000, and the monocytes and polymorphs each numbered about 30,000 per c.mm., with many immature forms of both series present. Her temperature was 100° F. (37.8° C.), and there were marked coarse rales over the left upper chest. Urethane (1 g. thrice daily), a blood transfusion of 3 pints (1.7 litres), and penicillin were given. There was a temporary remission in mid-June, when the leucocyte count fell to 23,000, but petechiae and ecchymoses reappeared. Streptomycin (1 g. daily)—the organisms being still sensitive—and a third transfusion of 4 pints (2.3 litres) were given, but the leucocyte count rose to a maximum of 111,000 and the haemorrhages increased. The patient became rapidly weaker and died suddenly from a haemorrhage into the medulla oblongata on July 16.

Investigations.—Radiographs of the chest indicated progressive healing of a diffuse bilateral fibrocaseous tuberculosis.