MEDIASTINAL PARATHYROID ADENOMA

The occurrence of a large radiologically evident functioning mediastinal parathyroid adenoma is rare. Only five isolated cases have been described previously in the literature, and in each case the patients had symptoms referable to renal calculi and/or classic symptoms of hypercalcemia, suggesting a disorder in calcium metabolism. However, despite its rarity, even in the absence of symptoms referable to a calcium disorder, one must still consider this possibility in the differential diagnosis of a mediastinal mass so the proper surgical approach may be made. This case is presented to demonstrate the problems encountered in the diagnosis and surgical approach to an asymptomatic patient with radiologically evident functioning mediastinal parathyroid adenoma in whom the possibility of a parathyroid adenoma was overlooked in the differential diagnosis.

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months the patient reported episodes of "lightheadedness." She denied syncope, vertigo, visual disturbances or motor or sensory disturbances. She described "nervousness" and hot flashes since hysterectomy in 1947. Except for a past history of urinary tract infection 18 years before, she denied any urinary symptoms, including polyuria, hematuria or flank pain. She denied any musculoskeletal symptoms or gastrointestinal symptoms.

Physical examination revealed a slightly obese Negro woman in no acute distress, alert and cooperative. Blood pressure was 180/115 in both arms. Pulse was 84. Respiration was 18. No conjunctival or corneal calcifications were noted. No mass was palpable in the neck and the neurologic examination was negative. Except for a grade II systolic ejection murmur heard best at the base, the examination was unremarkable.

Laboratory data on admission included the following: hemoglobin 15.3 gm percent; hemocrit 45 percent; white blood cell count 7,100 (with normal differential); urinalysis, SG 1.009, pH 6.0, protein 0, sugar 0, WBC 5 to 6, RBC occasional; urine culture revealed more than 100,000 col/ml of Escherichia group; BUN 13 mg percent; sodium 144 meq/liter; chloride 109 meq/liter; CO₂ 27.4 meq/liter; two hour postprandial sugar 96 mg percent; PB! 6.0 gram ag percent; serum creatinine 1.5 mg percent; creatinine clearance 45 ml/min.; 24-hour urine for vanillinmandelic acid 3.8 mg; alkaline phosphatase 13.8 BL units. Electrocardiogram was within normal limits. Chest x-ray films revealed a large right paratracheal mass (Fig. 1); heart and lungs were normal. Laminograms of the right paratracheal area revealed the mass to be in the mid-AP dimension and immediately adjacent to but separate from the aorta, and no calcification was noted. Timed intravenous pyelogram was normal but "Paget's disease" was diagnosed in the right innominate bone (Fig. 2). Barium swallow revealed a normal esophagus. Thoracotomy was advised for the mediastinal mass, and this was performed on June 6, 1969, from a right auxiliary incision through the fifth intercostal space. From this approach 14 gm of tissue were removed. However, the entire mass could not be excised because of extension into the neck. The histologic sections revealed the mass to be a parathyroid adenoma (Fig. 3). The postoperative course was uneventful.

Because of the histologic findings, further studies were obtained and reevaluation of the preoperative laboratory studies was made: serial calciums 11.6, 12.0, 12.5, 11.8, 10.8, 11.1, and 11.3 mg percent; phosphorus 1.2, 1.8, 2.0, 1.8, 2.1, and 1.8 mg percent; 24-hour urine calcium 32 mg (on 200 mg calcium diet). Tubular reabsorption of phosphorus 89.4 percent (normal 83 percent to 98 percent); 24-hour urine for hydroxyproline 92 mg (normal up to 90 mg/24 hours). Bone survey revealed marked cystic disease of the right innominate bone, compatible with parathyroid disease rather than Paget's disease previously diagnosed (Fig. 2). Cystic bone lesions were also seen in the head of the right humerus. Needle bone biopsy of the right posterior iliac crest revealed no uptake by parathyroid or remaining mediastinal tissue. A second surgical procedure was performed through a

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FIGURE 3. Section of the mediastinal mass (x 100) showing histologic appearance of a parathyroid adenoma.

FIGURE 4. Section of needle bone biopsy from right posterior iliac spine (x 100) revealing changes of osteitis fibrosa cystica. Note the osteoclast within a Haversian lacunae in the right lower portion of the field.
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typical transverse thyroid incision with removal of the remaining 5 grams of parathyroid tissue. In addition, the parathyroid glands in the neck were all visualized and appeared normal. Subsequent serial calciums were 9.3, 9.3, 9.0, 8.6, 9.2, 9.5, and 10.0 mg percent and serial phosphorus was 1.8, 2.0, and 2.9 mg percent. No signs of tetany developed. The hypoparathyroidism which persisted until the second surgical procedure, subsequently returned to normotensive levels and has remained so to the present.

DISCUSSION

The first reported case of mediastinal parathyroid adenoma was by Wellbrock in 1920. Norris reported 30 aberrant adenomas in 281 cases of parathyroid adenoma collected from the literature. Of these 30 cases, 19 were in the mediastinum (6.7 percent of total), 9 in the thyroid gland and 2 behind the esophagus. Cope reporting on 230 cases of hyperparathyroidism, stated that 10 percent of the normal lower parathyroid glands are found in the mediastinum, while Black found only three mediastinal adenomas in 355 cases of hyperparathyroidism (ie, less than 1 percent). This marked variance in prevalence may be in part due to different exposure in various institutions to problems of the clinical diagnosis of hyperparathyroidism.

In considering the variety of tumors that are seen in the mediastinum, the parathyroid adenoma is among the rarest. Although mentioned in the classification of mediastinal mass given by Lyons and co-workers no parathyroid adenomas were found in his experience with 783 cases and a review by Peabody and associates of a total of 855 cases included only two cases of parathyroid adenoma. Thompson in an extensive collective review of the world literature reported only on the experience of Cope (16 cases), Alexander (4 cases) and Norris (19 cases) with mediastinal parathyroid adenomas. The occurrence of a radiologically evident functioning mediastinal parathyroid adenoma is indeed rare. A review of the literature reveals only five previous cases. One of these being a giant functioning mediastinal parathyroid cyst. The case being presented is unique in that the patient had no symptoms referable to either renal calculus or classic symptoms of hypercalcemia, as noted in all the previously described cases. She did, however, despite denial of all symptoms referable to the skeletal system, have radiologic evidence of bone disease. This x-ray evidence of bone disease should have been a clue to the diagnosis of hyperparathyroidism. Unfortunately a mistaken roentgenologic interpretation prevented the further pursuance of that possibility. The x-ray film of the pelvis, seen on the timed IVP obtained as part of the hypertensive work-up, was incorrectly diagnosed as Paget's disease instead of osteitis fibrosa cystica. The alkaline phosphatase, done to evaluate the extent of the "Paget's disease," when found elevated was not unreasonably attributed to osteitis deformans. Confusion of the roentgenologic interpretation of osteitis fibrosa cystica with Paget's disease in a patient later found to have hyperparathyroidism has previously been reported. Also, Paget's disease has been reported associated with hyperparathyroidism.

Since in the consideration of a large radiologically evident mediastinal mass the possibility of a parathyroid adenoma was entirely overlooked, even in the presence of bone disease with elevated alkaline phosphatase, further studies including a serum calcium, the cardinal finding in hyperparathyroidism, were not obtained. If the diagnosis had been considered preoperatively, a single surgical procedure via a neck exploration with sternal splitting if necessary, would certainly have been preferable to the two separate procedures (right lateral thoracotomy followed later by neck exploration) necessary for total removal of the adenoma in this case.

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REFERENCES

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