CASE REPORT

Primary Hyperparathyroidism in an Adolescent Girl

Rashaud A, Najafizadeh M, Ghoraian MA

Institute of Endocrinology and Metabolism, Iran University of Medical Sciences, Tehran, I.R.Iran

The aim of this paper is to present the case of a 15.5 year old girl with primary hyperparathyroidism (PHPT) with symptoms of bone pain that appeared 2-3 years prior to admission; she had suffered bone fracture six months earlier and had high serum calcium, very high serum PTH and low serum phosphorous levels, all results being in agreement with PHPT.

The diagnosis was confirmed by imaging studies with 99m TC-Sestamibi scan, showing an adenoma in parathyroid tissue. The adenoma was removed by surgical operation. After surgery the patient was treated by high doses of calcium and vitamin D to avoid postoperative hypocalcemia.

Key Words: Primary hyperparathyroidism, Hypercalcemia

Introduction

Primary Hyperparathyroidism (PHPT) is a generalized disorder of calcium, phosphate and bone metabolism that results from increased secretion of the parathyroid hormone; it most commonly occurs in adults especially the elderly. However primary hyperparathyroidism does occasionally occur in children. PHPT may go undetected for years because of the minimal symptoms of the disease. The infrequency of screening lab tests in pediatric patients’ laboratory studies, including calcium and PTH levels, results in significant delays that often occur between onset of the symptoms and the time of diagnosis of primary hyperparathyroidism. Early diagnosis of the disease can help avoid metabolic consequences of hypercalcemia like hypercalcuria, nephrolithiasis, nephrocalcinosis, CNS damages, as well as bone fractures and other complications. In a study conducted by Kollars et al on 52 patients who underwent parathyroid resection between 1970 and 2000, the most common presenting symptoms reported were fatigue and lethargy, headache, nephrolithiasis, nausea, abdominal pain, vomiting and polydipsia. An adenoma of one or more parathyroid glands is the most common cause of the disease. It has been suggested that bone disease is more common whereas renal disease is less common in children. The classical presentation of PHPT with nephrolithiasis, cystic bone disease and soft tissue calcification has become less common and has been replaced increasingly by patients presenting with mild hypercalcemia and few or no symptoms.

Case Report

A 15.5 year old girl was admitted to the Institute of Endocrinology and Metabolism for evaluation of short stature. Her menstruation...
onset was three years prior to admission. Height was 147 cm and weight 34 kg. On admission the patient had genuvalgus and rather severe pain in her knees, that had begun about 2-3 years prior to admission. About 6 months before admission there was a fracture on the femur just above the knee following mild trauma (pathologic fracture). On physical examination diffuse bilateral goiter was noticed. There was a nodule under the lower pole of the right lobe of the thyroid, dimensions approx 2x2x2 cm. Laboratory examinations revealed the following results: T₃: 1.8 ng/mL (normal: 0.8-2.0), T₄: 4.9 μg/dL, (normal: 4.5-12), TSH, IRMA: 1.2 mIU/L (normal: 0.3-4.0).

Results for evaluation of parathyroid function showed high serum and 24-hour urine Ca levels, low inorganic phosphorous, high alkaline phosphatase activity, and alkaline pH of all urine samples. The most important finding was extremely high serum PTH levels; (Table 1). Radioisotope scan of thyroid gland with Technesium 99m reported decreased iodine uptake by thyroid lobes and increased background activity with a non functioning nodule. Radiography of carpal and metacarpal bones, revealed osteoporosis and preosteal resorption of these bones, especially on the radial part, suggesting hyperparathyroidism (Fig. 1). According to the MIBI parathyroid scan report following injection of TC-99 MIBI, early images showed a focus of tracer uptake in the lower portion of the right thyroid lobe. On delayed images, an area of increased uptake adjacent to the lower pole of the right thyroid lobe was noticed, a finding in favor of abnormal functioning tissue (parathyroid adenoma) (Fig. 2).

Surgical operation was performed for dissection of the nodule (right lower parathyroid
Table 1. Laboratory findings prior to surgical and after operation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Before</th>
<th>After</th>
<th>Reference range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Ca (mg/dL)</td>
<td>12.4</td>
<td>9.5</td>
<td>8.5-10.5</td>
</tr>
<tr>
<td>Serum Phosphorus (mg/dL)</td>
<td>2.7</td>
<td>3.2</td>
<td>Child.: 4.5-6.5</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Adults: 2.5-5.0</td>
</tr>
<tr>
<td>Serum alkaline phosphatase (IU/L)</td>
<td>1555</td>
<td>-</td>
<td>Up to 444</td>
</tr>
<tr>
<td>24hr urine Ca (mg/24hr)</td>
<td>432</td>
<td>65</td>
<td>100-300</td>
</tr>
<tr>
<td>24 hr urine phosphorous (mg/24hr)</td>
<td>600</td>
<td>189</td>
<td>400-1000</td>
</tr>
<tr>
<td>Serum iPTH (ng/mL)</td>
<td>2048</td>
<td>51</td>
<td>13-54</td>
</tr>
<tr>
<td>24 hr urine creatinine (g/24hr)</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6-1.8</td>
</tr>
</tbody>
</table>

... (rest of the text)
-Bone density at the lumbar spine, hip, or distal radius of more than 2.5SD below peak bone mass.

Surgery was recognized as the only definitive therapy for primary hyperparathyroidism and was acknowledged to be virtually an appropriate course of action. Accurate localization of adenoma prior to surgery is necessary for a successful operation. Using 99m Tc-sestamibi scintigraphy, a sensitive and specific parathyroid scan may be performed, resulting in reduction of operation time and morbidity. This technique was successfully used for localization of the adenoma in our patient.

Postoperative hypocalcemia may be caused by permanent or transient hypoparathyroidism or extensive skeletal remineralization and should be treated with high doses of calcium and vitamin D.

References