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Case Report

Rare Case of Parathyroid Adenoma Diagnosed in 18 Year Old Young Male Patient

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Abstract

Multiple endocrine neoplasia type 1 (MEN1, wermer's syndrome) is an uncommon autosomal dominant hereditary syndrome characterized by neoplasia of the parathyroid gland, pituitary gland, and pancreas. The parathyroid adenomas are usually not perceptible or conspicuous from much clinical point of view. All the signs and symptoms are mainly because by disturbed serum calcium levels. Calcium has a crucial role in controlling most body functions. The major features of hypercalcemia are renal stones, abdominal groans, bone pain, psychic moans, and fatigue overtones. Parathyroid adenoma has magnificent outcomes by surgical intervention.

Keywords: Parathyroid Adenoma, Diagnosis, Endocrine, Neoplasia.

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Introduction

The parathyroid gland is an endocrine gland having a vital contribution to the regulation of calcium and phosphorous level in blood. The number of parathyroid adenoma cases is limited. Parathyroid adenoma leads to unrestricted production of parathyroid hormone (PTH), known as primary hyperparathyroidism. The major cause of primary hyperparathyroidism is solitary adenoma (85%), while other causes are parathyroid hyperplasia (10%) and carcinomas (5%).[1] In the United States (US) the incidence of primary hyperparathyroidism is about 1:1000 population, predominantly affecting females. The majority of cases of hyperparathyroidism are subclinical. Skeletal and renal systems are primarily involved in hyperparathyroidism. The common manifestations of primary hyperparathyroidism are abdominal groans, renal stones, psychic moans, fatigue tones, and bone pain.[2]

The basic pathogenesis of hyperparathyroidism is an increased level of parathyroid hormone secretion leading to increased bone turnover and ultimately bone resorption. The parathyroid hormone increases serum calcium levels through bone absorption and decreased phosphate levels by thrashing through the kidneys. Moreover, it increases calcium absorption from the gut indirectly by calbindin (calcium-binding protein) and an active form of vitamin D.[3] The normal weight of the parathyroid gland is about 50 to70 mg. The size of the adenoma and level of parathyroid hormone (PTH) determine the degree of signs and symptoms. Those Patients having increased levels of serum calcium come across lethal complications due to excessive parathyroid hormone (PTH) production by the giant parathyroid adenoma.[4] Multiple Endocrine Neoplasia types 1 (MEN1, wermer's syndrome) is an uncommon autosomal dominant hereditary syndrome characterized by neoplasia of the parathyroid gland, pituitary gland, and pancreas. The associated tumors with Multiple Endocrine Neoplasia (MEN1) are pheochromocytoma, ependymoma, and gastrinomas (Zollinger-Ellison syndrome).MEN1 has very steep heritability with equivalent gender distribution. Its incidence is about one in 30,000 population. Primary hyperparathyroidism is the universal expression of MEN1, influencing greater than 95% of MEN1 cases.[5]

Case report

An 18 years old male patient previous no co-morbidities, presented to the outpatient department (OPD), with chief complaints of confusion, restlessness, profound muscle weakness, and weight loss for 1 month. The onset was insidious, progressively increasing day by day along with constipation, polyuria, and generalized body aches. The patient can't remember when he was exactly well. Approximately a month ago, parents noted some

unusual behaviors. He started refusing food and going to the washroom more frequently than before. He told his parents that he does not pass stool for days, sometimes up to a week. The parents noticed that he was becoming lazier. They also notice that child has marked weight loss in a short period. He also complained of frequent headaches. The parents took him to a Hakeem and later to a Pir. They treated him for 'Tabkheer-e-Maida' & 'jins' respectively, but with no relief. Past medical and surgical history is insignificant. On general physical examination a well-oriented but slightly restless and disinterested-looking young boy sitting on the stool. A general scan did not show any obvious abnormality. There is no anemia, jaundice, clubbing, koilonychia, lymphadenopathy, or thyromegaly. Vitals are BP: 90/60, Pulse: 60 bpm, RR: 14/min, Temperature: 98.2 F, and weight of 45 kg (previously 49 kg). PHQ-9 (Patient Health Questionnaire-9) contains nine questions in which each score is from 0 to 3 Total scores are 0 to 27, His score was 2 suggesting no depression. On ultrasound neck a homogenously enhancing left parathyroid adenoma measuring 1.5×2 cm in size. MRI of the brain showed ependymoma arising from the 3rd ventricle causing hydrocephalous. Ultrasound of abdomen showed few renal concretions. The hypercalcemia in a patient is treated by intravenous normal saline 3-4 liters, Oral hydration, Furosemide, and Zoledronic acid 5 mg (Aclasta) I/V infusion over 30 minutes. Restriction of calcium and vitamin D supplements.

Discussion

The parathyroid adenomas are usually not perceptible or conspicuous from much clinical point of view. All signs and symptoms are mainly because of disturbed serum calcium levels.[6] Most patients with parathyroid adenomas have no complaints about discomfort and any swelling in front of the neck. Mostly in parathyroid cancers, the midline swelling masses are easily appreciated.[7] Calcium has a crucial role in controlling most body functions. The major features of hypercalcemia are renal stones, abdominal groans, bone pain, psychic moans, and fatigue overtones. In developing countries, due to limited hospital resources, the early diagnosis and treatment of hypercalcemia are not possible. Persistent hypercalcemia comes out as osteoporosis, osteopenia, and ultimately bone fractures. Neurological disorders including muscle weakness and neuropathy are commonly observed.[8]

The diagnosis of parathyroid adenoma is based on clinical signs and symptoms and laboratory investigations including serum calcium levels and parathyroid hormone (PTH) levels. The calcium equilibrium in the blood is disturbed by increased PTH levels, hypercalcemia, hypercalciuria along with hypophosphatemia. In primary hyperparathyroidism Patients, there is an increased serum calcium level of up to 60% while a decrease in phosphate level to 50% per day.[9] About 80% of cases show mild hyperchloremic metabolic acidosis, and 10% have raised alkaline phosphatase along with bone deformity.[10] The diagnostic tool used for primary hyperparathyroidism and hypercalcemia is invasive and non-invasive procedures, routine x-rays of limbs and skull, and dual-energy absorptiometry (DEXA) scan. Ultrasound is used for the identification of nephrolithiasis and cholelithiasis. Other non-invasive techniques are CT, MRI, and even sestamibi scans.[11] Sestamibi scanning is 95% preciseand sensitive for parathyroid adenoma detection. It is also used for ectopic parathyroid tissue detection in about 16% of cases.[12]

Parathyroid abnormalities mainly lead to glandular growth. The scintigraphy has a high sensitivity of 80% in detecting solitary adenoma as compared to only 25% in the case of multiple adenomas. A study conducted by Mabulac and Twigt states that parathyroid adenomas are usually diagnosed with bone diseases in many cases. Braverman stated in his study that raised parathyroid

Table 1: *Laboratory investigations*

Hemoglobin	**13g/dl(normal)**	**Arterial blood gases**	**Not done**
WBC COUNT	8 x 10^3(normal)	Urinalysis	Normal
Platelets	325 x 10^3(normal)	Thyroid function tests	Normal
Renal Function tests	Normal	Creatinine phosphokinase(CPK)	Normal
Bilirubin, ALT&AST	Normal	Alkaline phosphatase	1718(raised) (N <438)
ALDOLASE and Random blood sugar(RBS)	Normal	Serum calcium	15.3mg/dl(markedly raised) (N 9.5-10.5)
Serum electrolytes	Normal	Parathyroid hormone(PTH) level	PTH (intact) = 2078 pg/mL(markedly raised) (N 15-68)

hormone (PTH) level has a great impact on the occurrence of bone diseases and neuropsychiatric problems.[13] In nutshell, parathyroid adenoma should be diagnosed if a patient has symptoms like persistent fatigue, bone pain, and fractures without any underlying history of trauma and irrespective of age. Parathyroid adenoma has a magnificent outcome by surgical intervention.

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