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PARATHYROID ADENOMA IN A CHILD - A RARE CASE REPORT WITH CYTOMORPHOLOGICAL CLUES

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ABSTRACT

Parathyroid adenoma is the most common cause of primary hyperparathyroidism. It commonly occurs in adults in the age group of 5th to 6th decade but it is rare in children. We present the case of a 12 year old female child presenting with renal calculi. Fine needle aspiration cytology (FNAC) revealed the diagnosis of Parathyroid adenoma which was further confirmed on histopathology with radiological and biochemical correlation. Awareness of parathyroid adenoma and its cytological features is important in order to differentiate it from thyroid lesions.

KEY WORDS- Parathyroid Adenoma, Primary Hyperparathyroidism, FNAC, Child

INTRODUCTION

The Parathyroid gland and its lesions comprise a small proportion of non palpable neck masses that are investigated by US guided FNAC.[1]

Three different lesions can affect the parathyroid gland and cause primary hyperparathyroidism-

a. Parathyroid hyperplasia
b. Parathyroid adenoma
c. Parathyroid carcinoma

Parathyroid hyperplasia affects all four glands while parathyroid adenoma and parathyroid carcinoma present as a mass affecting only a single gland.[2]

Primary hyperthyroidism is most commonly caused by parathyroid adenoma which is a virtually benign and functional tumour of the parathyroid gland. Solitary parathyroid adenoma is very rare in children.[3]

Here we evaluate the role of FNAC in the cytological diagnosis of parathyroid adenoma.

CASE REPORT

A 12 yr old female was brought to the emergency department complaining of colicky abdominal pain. Her relatives narrated history that the patient was perfectly all right until 1 year ago. To start with, the patient had pain in the lower abdomen and lumbar region since 1 yr which was on and off. For the same complaint she took pain killers with doctor's prescription at her hometown. Her pain was relieved for a short duration though she managed to stay in health for a year. Pain increased in severity since a month which led to her seeking frequent medical advice and ultimately land up in the emergency department for the same. She gave past history of similar complaint 2 yr back for which she was operated but no documentary evidence was available with the patient. She had no other complaints.

On general examination, the patient was listless in appearance with tenderness in the lower abdomen. Her pulse and blood pressure were well within normal limits.

Findings of USG abdo-pelvis suggested acute pancreatitis with minimal peripancreatic fluid collection and bilateral bulky kidneys with Renal Parenchymal disease with bilateral renal calculi obstructing and causing moderate grade III Hydronephrosis.

Laboratory evaluation revealed leukocytosis on complete blood count, elevated serum calcium (12.5 mg / dl) (N- 8.5 – 10.5 mg/dl), decreased serum phosphate and elevated serum lipase levels (1047 U/L) (N- upto 190 U/L). Other KFT parameters and urine routine microscopy were normal. She had no bony changes on x ray.

While working upon the case, her surgeon noticed a slight fullness in the anterior neck region. The surgeon sent her to USG and FNAC to rule out thyroid pathology.

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The patient was given an appointment for USG neck 2 days later. Meanwhile the patient came to the cytology OPD and we decided to take her for US guided FNAC directly. On guidance a small mass of 1 × 0.5 cm was seen on the right side of thyroid. FNAC was done from the mass by non aspiration technique and smears were stained with Haematoxyline and Eosin, Papanicolaou and May Grunwald Giemsa.

The cytosmears showed abundant cellularity of cells that were arranged in pseudopapillary pattern around vascular sheets. Cells showed scant to no cytoplasm, round to oval nuclei with fine chromatin and mild anisonucleosis. Background showed many bare nuclei. There was no evidence of follicles, colloid or macrophages. (Fig 1)

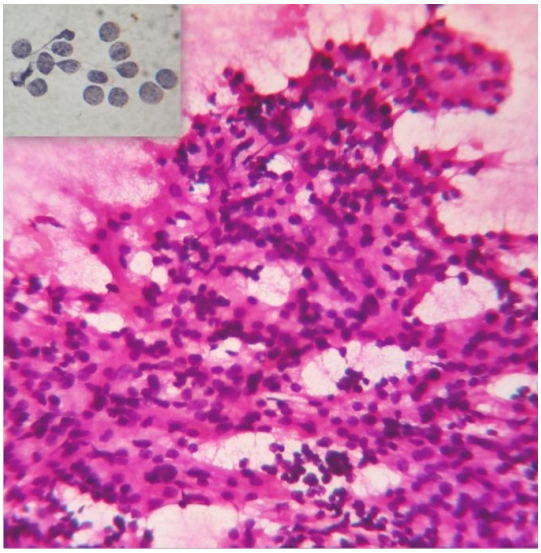

Fig.1 – Highly cellular smear showing cells in pseudo-papillary pattern around vascular sheets with scant cytoplasm, oval nuclei with mild anisokaryosis. (he, 10×) inset- nuclei showing granular chromatin (pap 100×).

Cytosmears suggested features of parathyroid origin. Therefore we offered a diagnosis of parathyroid adenoma and advised estimation of Parathyroid hormone (PTH) levels and follow up.

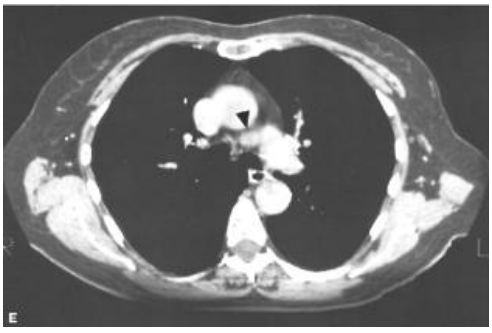

Fig.2 – CT scan neck- showing well defined mass of 1.2×0.8 cm in postero-inferior aspect of right lobe of thyroid (arrow head)

Two days later the patient received a report of increased parathyroid hormone levels (121 pg/ml) (N- 9 - 69 pg/ml) and CT scan neck showed well defined mass of 1.2×0.8 cm in the postero-inferior aspect of the right lobe of the thyroid, possibly right parathyroid adenoma. (Fig 2)

Technecium 99m sestamibi scan further helped with the diagnosis, showing focal uptake and retention below the right thyroid, suggestive of Parathyroid adenoma.(Fig 3)

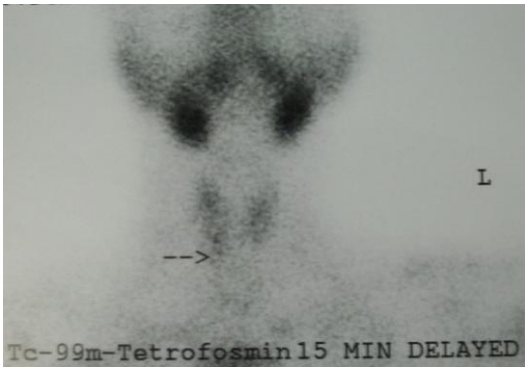

Fig.3 - Technecium 99 scan- showing focal uptake and retention below right thyroid (arrow)

The patient therefore had Parathyroid Adenoma since the last 2 years which was the cause of raised calcium levels and recurrent renal calculi.

The patient was posted for right inferior Parathyroidectomy. We received a single oval, capsulated, tan mass of 1×0.5 cm. Histopathology sections showed thinly capsulated mass. Cells were polygonal and uniformly arranged in sheets around delicate vascular septa having scant clear

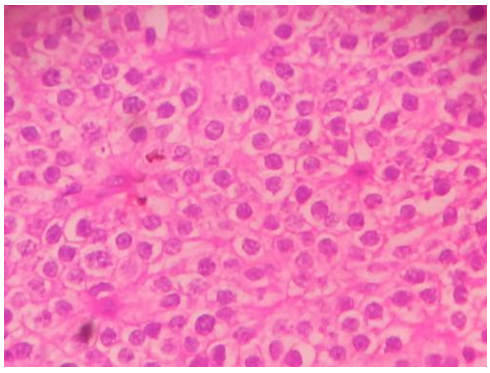

Fig.4 – Microphotograph showing sheets of uniformly arranged polygonal around vascular septa with scant clear or eosinophilic cytoplasm, oval nuclei with granular chromatin (HE 40×)

or pale eosinophilic cytoplasm. Nuclei were round to oval with granular chromatin. Mitoses were absent. Diagnosis of parathyroid adenoma was thus confirmed. (Fig 4)

DISCUSSION

Hyperparathyroidism is a syndrome resulting from increased production of parathyroid hormone due to diseases of the parathyroid gland which occurs in approximately 2-5 per 100000 in the general population.[4] Primary hyperparathyroidism is rare in children with an estimated incidence of 0.02-0.05 per 1000. When primary hyperthyroidism is present in children, one should rule out the presence of MEN syndrome.[5] Parathyroid adenoma is a benign; hyper functioning neoplasm of the parathyroid gland and is seen in premenopausal women commonly.[6] Solitary Parathyroid adenoma causing hyperparathyroidism in a child is very rare. The exact incidence has not been mentioned in the literature yet.[3]

Increased incidence of parathyroid adenoma has been noticed in children who have received radiotherapy to orbits, thyroid and lung.[7] Patients with hyperparathyroidism present with neuromuscular weakness, easy fatigability, neuropsychiatric disturbances, renal stones, gall stones, osteitis fibrosa cystica, hypertension, pancreatitis , peptic ulcer and metastatic calcification. Our patient presented with recurrent renal calculi and pancreatitis.[8]

She underwent Per Cutaneous Nephrolithotomy (PCNL) for renal calculi and pancreatitis was managed with total parenteral nutrition (TPN)

It is very important for the pathologist to distinguish between thyroid and parathyroid lesions so as to decide the mode of treatment and to ensure better prognosis for the patient. Dimashkieh and Krishnamurthy documented that smaller nuclei than thyroid follicular cells, bare nuclei, stippled chromatin, and prominent vascular network with epithelial cells indicate parathyroid origin. But no single criterion can distinguish between thyroid and parathyroid lesions. There should be a set of criteria along with clinico-radiological features and biochemical parameters.[9]

Normal parathyroid glands are usually not detected by any imaging modality because of their small size, close resemblance and location to the thyroid gland. Various imaging techniques may be used to localize hyperfunctioning Parathyroid but Technetium 99m- Sestambi scanning is the most sensitive and specific for locating the parathyroid gland.[10]

Surgical intervention is almost always indicated through total or subtotal parathyroidectomy. Immediate postoperative estimation of Sr calcium, Sr phosphorous and PTH levels indicates the prognostic value. Our patient had uneventful surgery and had 2 yr follow up with regular estimation of Sr calcium, Sr phosphorus and Sr PTH. She did not develop subsequent recurrent hyperparathyroidism.

Immunostain for PTH is helpful for ascertaining the parathyroid nature of neoplasm. Immunostain for PTH is usually performed on destained Pap smears or on cell block preparations.

CONCLUSION

FNAC is an important tool for diagnosis of parathyroid adenoma to distinguish it from thyroid lesions because of overlapping cytological features between the two. A close working relationship between the surgeon and the pathologist along with radiological findings and biochemical parameters increases the diagnostic sensitivity of parathyroid adenoma.

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