Parathyroid Lipoadenoma: A Rare Entity

Sir,

Parathyroid lipoadenoma is an unusual variant of primary hyperparathyroidism (PHPT). It consists of hyperfunctioning parathyroid cell nests in abundant fatty stroma. Otherwise fat-containing lesions of endocrine glands are uncommon. It resembles lipoma rather than adenoma. Chow *et al*.[1] defined it as single parathyroid adenoma with more than 50% fat on histologic examination in conjunction with PHPT and resolution of hypercalcemia postoperatively. The World Health Organization defines parathyroid lipoadenoma as a "hamartoma-like benign neoplasm containing both chief cells and prominent stromal elements."[2] Nonfunctional parathyroid lipoadenomas have also been reported.[3] Normally, fat occupies approximately 25% of adult parathyroid gland, and it increases with age and obesity.[4]

In 1958, Ober and Kaiser[5] described parathyroid lipoadenoma for the first time in an asymptomatic 43-year-old male and termed it as "hamartoma of the parathyroid." It has also been reported as parathyroid lipohyperplasia[6] and parathyroid adenoma with myxoid stroma.[7] The term "parathyroid lipoadenoma" was coined in 1962 by Abul-Haj *et al*.[8] Parathyroid lipoadenomas can occur at any age group but are more common among middle-aged females.[6,9] Clinical features and laboratory investigations of parathyroid lipoadenoma resemble that of usual parathyroid adenoma. Approximately 60 cases of parathyroid lipoadenoma have been reported so far. The rarity of the entity and resemblance with normal parathyroid tissue microscopically makes its diagnosis difficult. We present a case of a 34-year-old asymptomatic female found to have PHPT due to parathyroid lipoadenoma.

A 34-year-old female diagnosed to have mild hypercalcemia (10.9 mg/dl) and hypophosphatemia (1.9 mg/dl) on routine investigations was referred to us for further evaluation. She did not have any symptoms suggestive

of PHPT such as bone pains, fatigue, kidney stones, fractures, and proximal muscle weakness. On examination, a large, soft mass was palpable on lower part of the right side of neck extending behind manubrium. The systemic examination was unremarkable. Laboratory investigation showed high PTH (638.2 pg/ml), low Vitamin D levels (12 ng/ml), and high 24-h urinary calcium (516.4 mg/dl) with normal renal and liver function tests. ^{99}Tc-sestamibi scan did not show any area of high uptake in the neck. Ultrasound and computed tomography scan neck showed soft-tissue mass lesion on the right lower neck extending into mediastinum [Figure 1a]. On parathyroid exploration, enlarged right inferior parathyroid gland embedded in a large fatty mass, extending behind carotid artery and jugular vein into mediastinum, was revealed. Right inferior parathyroidectomy with the removal of mediastinal component of the mass was done; it was easily dissectible from the surrounding structures.

The specimen consisted of yellow, lobulated, soft-tissue mass, 8 cm × 4 cm × 4 cm in size, weighing 34 gm. Cut sections showed predominantly yellow areas with focal nodular gray-white areas [Figure 1b]. Microscopic examination showed nodules and islands of parathyroid epithelial cells in a background of abundant lipomatous tissue [Figure 1c]. It was encapsulated all over. The parathyroid epithelial cells were predominantly chief cells type. No atypia, mitosis, necrosis, and capsular or vascular invasion were seen. Based on these gross and microscopic findings, diagnosis of parathyroid lipoadenoma was made.

Postoperatively, PTH and serum calcium levels dropped to 187 pg/ml and 8.4 mg/dl, respectively. The patient was discharged on oral calcium and Vitamin D supplementations. The patient was normocalcemic at last observation before writing of this case.

Single parathyroid adenoma (85%) is most common cause of PHPT. Parathyroid lipoadenoma is its rare and unusual variant. Obara *et al*.[10] reported 4 (1.6%) cases of parathyroid lipoadenoma in a series of 253 cases of PHPT. Parathyroid lipoadenomas vary in weight and may measure up to several centimeters. Because of the large size, they may extend into the mediastinum. Parathyroid lipoadenoma consists of intermingling of chief and oxyphil cells with abundant adipose cells, which comprises 20%–90% of tumor.[11,12] It can have either chief cell or oxyphil cells as functional component.[1] Origin of enlargement of fatty tissue component remains unknown; maybe factors responsible for parathyroid chief cell enlargement also cause it.

In previously reported cases, approximately 64% cases had symptomatic disease, 28% were asymptomatic, and 7% had questionable symptoms.[13] Unlike parathyroid adenomas, they are not associated with multiple endocrine neoplasias or familial hyperparathyroidism. Parathyroid lipoadenoma is difficult to detect on preoperative imaging, may be due to high-fat content. Nuclear scan in our patient was not able to detect any lesion. The comparative differences between parathyroid lipoadenoma and classic parathyroid adenoma are mentioned in Table 1.

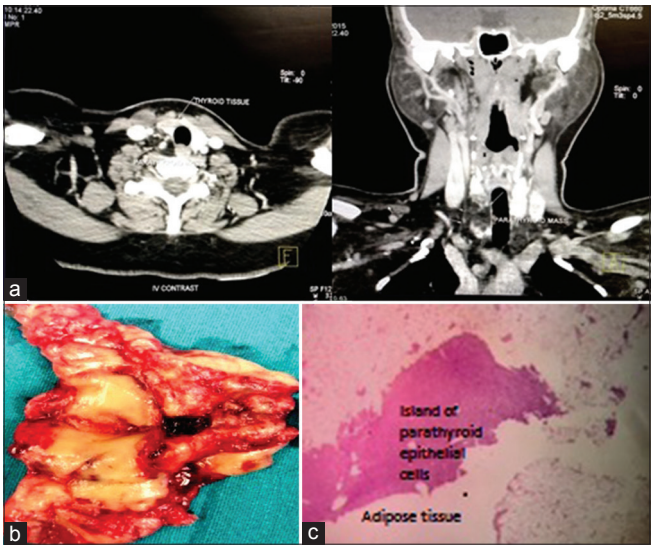

Figure 1: Radiological (a) gross, (b) low-power microscopic, (c) view of parathyroid lipoadenoma. Computed tomography: Mass lesion on the right lower neck extending into mediastinum

Table 1: Differences between parathyroid lipoadenoma and classic parathyroid adenoma

Parameters	Parathyroid lipoadenoma	Parathyroid adenoma (classic)
Occurrence	Rare	Relatively common
Sign and symptoms	Same	Same
Size	Large in size (up to several centimeters)	Smaller size in comparison
Serum calcium	Mildly elevated (<13 mg/dl)	May be very high (>14 mg/dl)
USG echotexture	Hyperechoic	Hypoechoic
Sestamibi scan	Difficult detection on preoperating imaging due to fat	Good sensitivity and specificity
Histopathology examination	Intermingling of chief and oxyphil cells with abundant adipose cells	Hypercellular parathyroid tissue without atypia, lined by capsule, thin rim of "normal" tissue compressed along one side of the mass, negligible fat content

USG: Ultrasonography

We conclude that due to rarity of the entity, parathyroid lipoadenoma as a cause of PHPT may be overlooked. Hence, knowledge of this entity is necessary to ensure that it does not get unnoticed as a cause of PHPT.

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Conflicts of interest

There are no conflicts of interest.

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