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Case Report

Giant Parathroid Adenoma With Thoracic Extension: A Case Report

Hejer Mbarek, MD*; Hadhemi Belaid, MD; Khaled Khamassi, MD; Ines Riahi, MD; Habib Jaafoura, MD; Sondes Mannoubi, MD; Rim Lahiani, MD; Mamia Ben Salah, MD

Department of Otorhinolaryngology-Head and Neck Surgery, Charles Nicolle Hospital, Tunis, Tunisia

***Corresponding author**
Hejer Mbarek, MD
Department of Otorhinolaryngology-Head and Neck Surgery, Charles Nicolle Hospital, Tunis, Tunisia; Tel. +216 52181495; E-mail: hejer.mbarek@gmail.com

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ABSTRACT

A 31-year-old female patient was addressed to our consultation for management of hypercalcemia secondary to primary hyperparathyroidism. The physical examination results were normal. The technetium sestamibi (^{99m}Tc MIBI) parathyroid scintigraphy showed a large fixation area next to the inferior pole of the left lobe of the thyroid. Cervical computed tomography (CT) scan showed a 6 cm tissue lesion in the inferior pole of the thyroid's left lobe. The patient was operated through a classical cervical incision, extracting successfully a 6 cm brown lesion. The histopathological study has confirmed the diagnosis of a giant parathyroid adenoma weighing 84 g.

Keywords
Giant parathyroid adenoma; Pancreatitis; Primary hyperparathyroidism.

Abbreviations
PTH: Parathyroid Hormone; CT: Computed Tomography; SICU: Surgical Intensive Care Unit; MRI: Magnetic Resonance Imaging.

INTRODUCTION

Primary hyperparathyroidism is the third most common endocrine disease. It is associated with hypercalcemia due to oversecretion of parathyroid hormone (PTH). Parathyroid adenoma is the leading cause of this disorder (80% of cases); however, hyperplasia and carcinoma are found in 15% and less than 1% of cases respectively.[1] Giant parathyroid adenoma is an extremely rare entity, especially in developed countries, with sporadic reports of masses attaining 70 g or more.[1,2] The surgical management is a challenge. We report a case of giant parathyroid adenoma in a 31-year-old female patient diagnosed after an episode of pancreatitis.

CLINICAL CASE PRESENTATION

A 31-year-old female patient has presented a couple of months before an episode of acute pancreatitis, which was treated successfully in a surgical intensive care unit (SICU). Test results have concluded that the pancreatitis was caused by hypercalcemia secondary to primary hyperparathyroidism. The physical examination results were normal. Blood tests showed that the PTH was twice the normal level and the renal function was normal. The technetium sestamibi (^{99m}Tc MIBI) parathyroid scintigraphy showed a large fixation area next to the inferior pole of the left lobe of the thyroid, related to a huge parathyroid adenoma. Cervical computed tomography (CT) scan showed a 6 cm tissue lesion in the inferior pole of the thyroid's left lobe, repressing backward the subclavian artery, and forward the common carotid artery. This lesion circumvents the left common carotid artery reaching the mediastinum orifice (Figure 1).

The patient was operated by a classical cervical incision,

extracting successfully a 6 cm brown lesion next to the inferior pole of the left thyroid lobe (Figures 2 and 3). Intra-operative PTH test confirmed the total resection of parathyroid adenoma. In post-operative period, our patient had neither dysphonia nor paresthesia. Blood test control showed the normalization of the PTH and calcemia levels. The histopathological study showed a composite tissue arranged in sheets, trabeculae and acini formed of cells with round to ovoid fine nuclei, tiny nucleoli and moderate amounts of clear and eosinophilic cytoplasm, with no capsular nor vascular invasion, consistent with a parathyroid adenoma weighting 84 g.

DISCUSSION

Primary hyperparathyroidism is the result of an excessive and inappropriate production of parathyroid hormone. It is most commonly caused byadenoma.[2] The parathyroid adenoma's weight ranges usually from 1 to 70 mg. Giant parathyroid adenomas are extremely rare.[1,2] They are defined according to their weight; however, there is a controversy concerning their definition. Spanheimer characterized giant parathyroid adenoma by an increased weight >3.5 g.[3] The greatest giant adenoma described in the literature was reported by Çakmak (145 g).[2]

Over the years, the clinical presentation of primary hyperparathyroidism has changed from a severe disease to a disease with subtle symptoms and physiologic perturbations.[4] The examination of the cervical region is usually with no particularities. The elevated levels of serum calcium is at the origin of skeletal, renal, gastrointestinal, cardiac, and neurological symptoms. Patients suffer from neuromuscular weakness, memory loss and decreased concentration. The main symptoms are acute abdominal pain, constipation, vomiting and nausea.[5] In our case, the hypercalcemia due to primary hyperparathyroidism was diagnosed after an episode of pancreatitis. This association is reported in <10% of cases in the literature.[6] Krishnamurthy reported the same circumstance of discovery in a patient presenting recurrent episodes of acute pancreatitis.[4]

Blood tests showed, in our case, hypercalcemia with high level of PTH confirming the diagnosis of a primary hyperparathyroidism. Normocalcemic hyperparathyroidism can also be seen and should not be confused with secondary hyperparathyroidism.[5]

The diagnostic of primary hyperparathyroidism is based on biochemical criteria; however, the localization of the pathologic parathyroid gland and the planning of the surgical management require imaging methods.

The technetium sestamibi (^{99m}Tc MIBI) parathyroid is the most widely used modality for localization of parathyroid adenomas.[7] It uses the absorption of radiotracer from hyperactive parathyroid tissue, in order to localize abnormal parathyroid glands.[5] Technetium-99m (^{99m}Tc) sestamibi has been introduced for parathyroid imaging in 1989 and the technique has been subject to several changes with an important improvement of its efficiency.

Figure 1. *Axial (A) and Coronal (B,C) CT Scan Images Showing a 6 cm Tissue Lesion in the Inferior Pole of the Thyroid's Left Lobe, Repressing Backward the Sub Clavian Artery, and Forward the Common Carotid Artery and Reaching the Mediastinum Orifice*

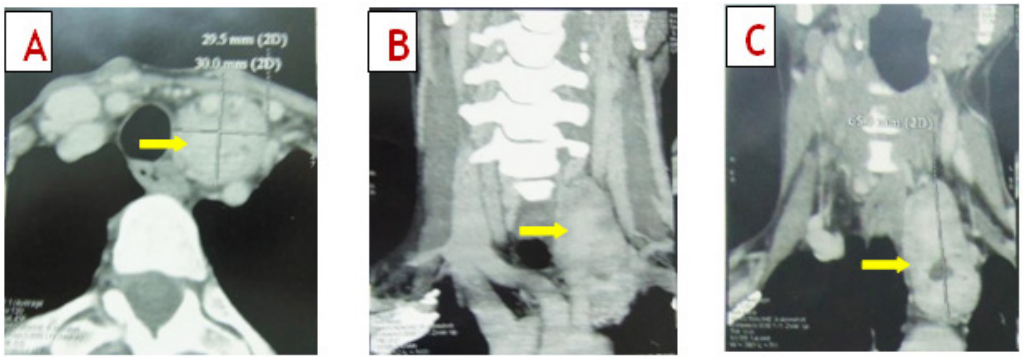


Figure 2. *Intra-Operative View of the Giant*

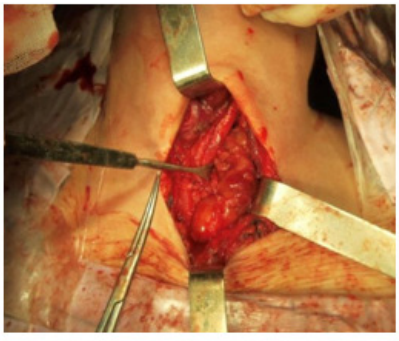
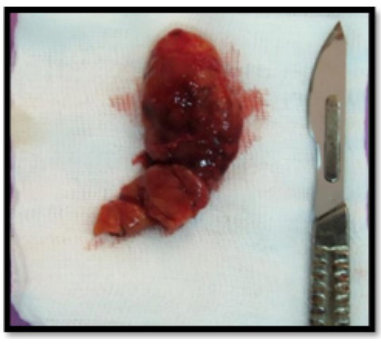


Figure 3. *Giant Parathyroid Adenoma after Resection Parathyroid Adenoma Via Transcervical Incision*



Alabdulkarim found in his study evaluating this imaging method, a sensitivity and specificity of 98.1 and 97%, respectively.[8] The principal limitation of the scintigraphy is its conventional planar view. The incorporation of single-photon emission computed tomography-computed tomography (SPECT-CT) as a component of hybrid imaging enables a high spatial resolution three-dimensional (3D) image.[4,7]

In the ultrasounds, parathyroid adenoma appears as hypoechoic mass with smooth borders and homogeneous echogenicity.[9] However, this modality used alone, especially in giant adenomas, can underestimate the size as only a part of the adenoma may be visualised transcervically.[1]

Pre-operative cross-sectional imaging such as CT-scan or magnetic resonance imaging (MRI) delineates the anatomy of the entire adenoma, precises the site, the size, the relation with surrounding structures, and thus facilitates surgical management and prevents unplanned conversion to a thoracic approach.[1]

Surgical excision of the hyperfunctioning gland is the main treatment for parathyroid adenoma. The standard surgical approach is transcervical through a low anterior cervical incision. Radionucleotide-guided localization with technetium injection can also be used intra-operatively.[10] Median sternotomy and thoracotomy are of great interest in cases of large inaccessible masses.[11] Our case showed that a trans-cervical excision of giant parathyroid adenoma is a viable approach for resection and should be considered prior to more aggressive approachs.

Intra-operative PTH testing, practiced in our case, confirms the parathyroid adenoma resection when PTH levels fall >50%.[10] Clinical and biological follow-up is necessary for post-operative period. Giant parathyroid adenomas are associated with higher rates of post-operative hypocalcemia and may need infusion of calcium and oral calcitriol supplementation.[1] In our case, the post-operative values of calcium and PTH were normalized.

CONCLUSION

Giant parathyroid adenoma is a rare entity that can be a troublesome cause for primary hyperparathyroidism. Precise pre-operative localization and evaluation of the size and the relation to surrounding structures, based on ^{99m}Tc MIBI parathyroid scintigraphy and CT scan or MRI, is vitally important prior to surgical management. The treatment consists on the resection of the pathologic parathyroid tissue. The excision can be safely performed *via* a collar incision, as in our case. Thoracotomy or sternotomy are reserved for inaccessible adenomas.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

CONSENT

An informed consent has been obtained from the patient.

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