

## Ectopic mediastinal parathyroid adenoma

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**Abstract.** Ectopic mediastinal parathyroid adenomas may be cause of Primary Hyperparathyroidism (PH). The occurrence of these lesions is explainable on embryologic basis. We report the case of a 20-year-old patient with PH due to an ectopic mediastinal parathyroid adenoma located in the anterior mediastinum. After its accurate pre-operative localization, surgical resection through a cervical manubriotomy was performed. Serum calcium and parathyroid hormone (PTH) levels returned promptly within the normal range, no complications occurred and the patient was discharged in the 4<sup>th</sup> postoperative day. Different surgical approaches are discussed.

**Key words:** ectopic mediastinal parathyroid adenoma, primary hyperparathyroidism, cervical manubriotomy

### Introduction

Primary Hyperparathyroidism (PH) is due in about 80% of the cases to a parathyroid adenoma, in more than 15% to a glandular hyperplasia and extremely rarely to a parathyroid adenocarcinoma. The therapy of PH is surgical and consists in the excision of the oversecreting parathyroid glands. Nearly a fourth of all parathyroid adenomas is settled in the mediastinum (1). The occurrence of these lesions is explainable on embryologic basis. The parathyroid glands arise in an ectopic site in 1-3% of the cases and may be found anywhere from the angle of the jaw to the pericardium as a consequence of a variability in the glandular tissue migration during the embryologic life. In more than 80% of the cases the ectopic mediastinal parathyroid glands are found within or in close contact with the thymus in the anterior mediastinum (2). In particular the lower parathyroid glands arise with the thymus in the third pharyngeal pouch and migrate with it into the lower neck and superior mediastinum (3). In this setting ectopic glands may be found

in the antero-superior mediastinum, the large majority can be reached by a collar incision and less than 4% requires a transthoracic approach to be resected. We report the case of a young patient with PH due to an ectopic mediastinal parathyroid adenoma located in the anterior mediastinum, that was excised through a minimal cervical incision and a vertical manubriotomy. Different surgical approaches are discussed.

### Case Report

We describe the case of a 20-year-old male with a history of repeated back-ache due to calcium oxalate renal stones. He was found to have hypercalcemia (13 mg/dl) and increased PTH serum level (189 pg/ml). In order to discriminate between PH and pseudohyperparathyroidism, a solid-phase, two site chemiluminescent enzyme-labeled immunometric assay directed towards the intact PTH molecule was used and a diagnosis of PH was made. Several studies were performed with the purpose to achieve a pre-

operative localization of the oversecreting parathyroid tumor. A cervical sonography showed a normal thyroid gland and no evidence of the tumor was found in the neck. Therefore a 67-Gallium scintigraphy was carried out and an accumulation area projected onto the anterior mediastinum was demonstrated. Finally a computed tomography scan of the thorax revealed a 2 cm nodule, in the thymic region of the anterior mediastinum (Fig. 1). The patient underwent surgical resection of the mediastinal tumor by means of a cervical trans-manubrial approach. A 7x3x2 cm surgical specimen of fat-connective tissue containing a 2x1.5x1 cm nodule was removed. The anatomicopathological examination revealed a reddish brown capsulated nodular lesion embedded in thymus glandular tissue and the permanent section confirmed the diagnosis of parathyroid adenoma. PTH serum level (25 pg/ml) and calcemia (9.1 mg/dl) decreased promptly to normal ranges and no calcium supplement was needed. The post-operative course was uneventful and the patient was discharged in 4<sup>th</sup> post-operative day with an excellent functional and cosmetic result. A quarterly follow-up was started. PTH serum level and calcemia have been within normal ranges all through 18 months after surgery.

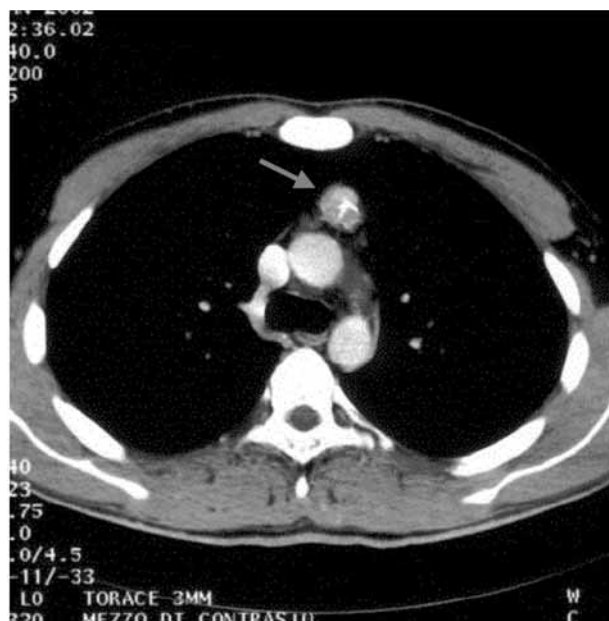


Figure 1. CT evidence of Mediastinal Parathyroid Adenoma (arrow)

## Discussion

Ectopic parathyroid adenomas, inaccessible to a cervical exploration, account for 1 to 3% of all parathyroid tumors (4) and are frequent cause of failed initial surgery for PH. It follows that an accurate preoperative localization by imaging procedures, including sonography, scintigraphy, computed tomography scan and magnetic resonance tomography is definitely required in case of ectopic adenomas in the neck and especially in the chest. The majority of them are located in the anterior mediastinum, less frequent locations are in the visceral compartment of the mediastinum, in a paraesophageal position, in the aortopulmonary window or close to the right pulmonary artery near the tracheal bifurcation (2). The best approach to the adenomas of the anterior mediastinum is still controversial. Median sternotomy or thoracotomy were the traditional surgical approaches to these lesions, with the morbidity, hospitalization and discomfort related to major thoracic operations. In the last decade the use of thoracoscopy has been proposed in the cases of precisely located tumors (5), as a less invasive procedure with minimal associated morbidity, shortened hospitalization and improved cosmesis. Nevertheless thoracoscopy requires from three to four lateral minimal incisions, lateral decubitus of the patient, intubation with Carlens double lumen tube to allow single lung ventilation and more the need of a pleural drainage tube pressing the intercostal nerve on the rib for some days. We performed a 2.5 cm U-shaped cervical incision and a vertical manubriotomy. This minimally invasive approach allowed an easy resection of the adenoma which was included in the left lower portion of the thymus. Furthermore this approach let the patient lying on his back, without need of single lung ventilation. These favourable conditions, together with the absence of a pleural drainage tube, gave the patient less discomfort and a shorter hospital stay. In conclusion we believe that the choice of the best surgical approach must be strictly related to the position of the adenoma, consequently the preoperative localization of a missing parathyroid tumor by imaging techniques is mandatory. We prefer a cervical approach associated to a vertical manubriotomy in case of adenomas settled in the antero-superior mediastinum and reserve thoracoscopy to less common

cases of tumors situated deeper close to the diaphragm or posteriorly in the visceral compartment of the mediastinum. A cervical exploration should always precede any further procedure in case of lacking pre-operative localization of the adenoma.

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