

Ectopic Middle Mediastinal Parathyroid Adenoma Excision via Video-Assisted Mediastinoscopy: A Case Report

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Citation: Allothmani S, Alshuhayeb A, Abogamila R, Alrashed N (2024) Ectopic Middle Mediastinal Parathyroid Adenoma Excision via Video-Assisted Mediastinoscopy: A Case Report. Annal Cas Rep Rev: ACRR-371.

Received Date: 08 January, 2024; **Accepted Date:** 15 January, 2024; **Published Date:** 19 January, 2024

Abstract

Primary hyperparathyroidism is a common endocrine disorder primarily caused by a single adenoma, necessitating parathyroidectomy for effective treatment. While most adenomas are located near the thyroid gland, ectopic parathyroid adenomas present unique challenges. This case discusses a 39-year-old male with Primary hyperparathyroidism symptoms, diagnosed with a middle mediastinal ectopic parathyroid adenoma. Preoperative localization involved CT and sestamibi scans, revealing the adenoma in the middle mediastinum. Video-assisted mediastinoscopy was used for the excision.

Discussion encompasses the varied locations of ectopic parathyroid glands and the necessity for accurate preoperative localization. Traditionally, sternotomy and Video-assisted thoracoscopy are employed for deeper lesions, but Video-assisted mediastinoscopy, a less invasive technique, is a safe alternative. The success of Video-assisted mediastinoscopy depends on visualizing the precise location within the mediastinum, making it particularly useful for upper mediastinal adenomas. Literature on Video-assisted mediastinoscopy for middle mediastinal parathyroid adenomas is limited, emphasizing the need for more reported cases.

In conclusion, this case demonstrates the efficacy and safety of Video-assisted mediastinoscopy in excising a middle mediastinal ectopic parathyroid gland in a patient with Primary hyperparathyroidism. Despite the limited literature on Video-assisted mediastinoscopy for middle mediastinal parathyroid adenomas, our findings support its use as a viable and safe alternative to traditional approaches.

Keywords: Primary hyperparathyroidism, parathyroid adenoma, middle mediastinal, Video-assisted mediastinoscopy.

Introduction

Primary hyperparathyroidism (PHPT) which is characterized by excessive secretion of parathyroid hormone is one of the most common endocrine disorders and is a leading cause of hypercalcemia and hypophosphatemia. 80 to 85 percent of cases are caused by a single adenoma for which parathyroidectomy is the most effective therapy [1]. Parathyroid adenomas are often located near the thyroid gland in the neck; however, ectopic parathyroid adenomas may be present. Mediastinal ectopic parathyroid adenoma accounts for 2% of all parathyroid tumor that causes primary hyperparathyroidism [2]. Careful preoperative localization, intraoperative monitoring and surgical approach is crucial for successful complete surgical excision with the least associated morbidity possible [3].

Case Presentation

A 39-year-old male, not known to have any chronic medical illness, presented to the clinic with complaints of easy fatigability, bone pain, and constipation for the past 2 years. There was no history of abdominal pain, nausea, or

vomiting, and no chest pain or dyspnea. Upon examination, his vital signs were within normal limits, neck examination showed no obvious mass and chest and abdominal examinations were unremarkable. His laboratory investigations showed a high calcium level of 2.75 mmol/L (normal range: 2.15–2.55), a low vitamin D level measuring 35 nmol/L (normal range: 75–249 nmol/L), and an elevated parathyroid hormone level (PTH) measuring 83 pg/ml (normal range: 15–65 pg/ml). Other laboratory investigations, including complete blood count, chemistry, and liver function tests, were within normal ranges.

Based on the above findings, the patient was diagnosed with primary hyperparathyroidism and further workup with neck ultrasound was performed for localization of parathyroid adenoma vs. hyperplasia. Ultrasound of the neck did not identify any abnormal parathyroid gland, so other modalities, including a CT scan (Figure 1) and a sestamibi scan (parathyroid scan) (Figure 2A & 2B), were required for localization; both showed middle mediastinal ectopic parathyroid gland.

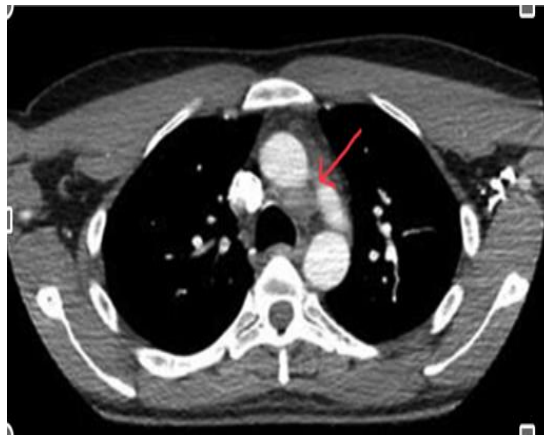
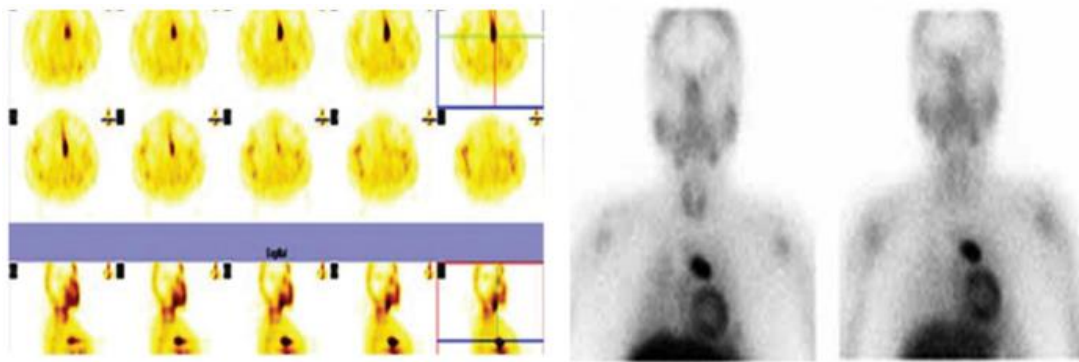


Figure 1: CT chest, showing middle mediastinal parathyroid gland at aorto-pulmonary window (red arrow).



Figures 2A & 2B: parathyroid scan, showing ectopic parathyroid in the middle mediastinum.

The patient underwent video-assisted mediastinoscopy (Figure 3), an ectopic parathyroid gland was identified in the middle mediastinum at the level of left lower paratracheal location, and it was removed (Figure 4). Parathyroid hormone level was measured intraoperatively and reached 992 pg/ml, which was expected due to manipulation of the gland. The gland was sent to a frozen section, which confirmed a parathyroid adenoma. The parathyroid hormone level was measured again 10 minutes after the removal of the adenoma, which returned to a normal level,

confirming the removal of all abnormal tissues. The patient was discharged on postoperative day 3 and followed up in the outpatient clinic. One week after surgery, the patient reported improvement in his symptoms of lethargy, bone pain and constipation. Laboratory results showed normalization of the calcium and parathyroid hormone. The patient was followed-up in the clinic for 2 years postoperatively, with periodic measurements of calcium and parathyroid hormone levels, which were within normal limits.

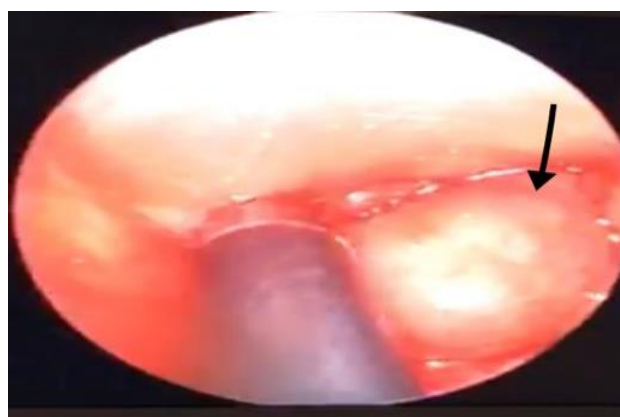


Figure 3: intra operative picture of Video assisted mediastinoscopy, showing the parathyroid adenoma (arrow).



Figure 4: parathyroid adenoma after excision, next to the incision used for mediastinoscopy.

Discussion

Depending on its location, an ectopic parathyroid gland can be classified as submandibular, retro-pharyngeal, retro-esophageal, postero-superior mediastinal, antero-superior mediastinal, intrathyroidal, intrathymic and within the tracheo-esophageal groove, carotid sheath, thyrothymic ligament [4]. They may occasionally be found in the pericardium and less frequently in the aorto-pulmonary window [4], [6]. The majority of ectopic mediastinal parathyroid glands are found in the thymus, or more frequently, in the antero-superior mediastinum's cervical tongue of thymus. Most of these lesions can be removed using a standard cervical approach; sternotomies are necessary for lesions that are deeper [7]. Preoperative CT and sestamibi scans have been reported to assist surgeons in determining the optimal initial surgical strategy for mediastinal parathyroid glands [8].

A common procedure for removal of ectopic parathyroid glands situated in the pericardium, aortopulmonary window, or middle or posterior mediastinum is sternotomy [9], [10]. According to a different report, an open thoracic approach should be used if the mediastinal parathyroid gland is found below the innominate vein [5]. According to Gawrychowski et al., upper median sternotomy is a safe and efficient surgical procedure for treating ectopic mediastinal parathyroid lesions in patients with primary hyperparathyroidism [7]. However, postoperative complications like fractures are linked to median sternotomy or thoracotomy [11]. To add, the morbidity rate of sternotomy or thoracotomy is around 20% [12]. A number of less invasive techniques, including video-assisted mediastinoscopy (VAM) [11], video-assisted thoracoscopic surgery (VATS) [13], and angiographic ablation, have recently been introduced. There have been some reports on the use of mediastinoscopy in situations where ectopic adenomas are located in the upper mediastinum and cervical region [14], [3]. Because the mediastinum is surrounded by a significant amount of fat tissue, the success of the mediastinoscopic procedure depends on whether the precise location can be visualized [15].

Result

The patient's surgical intervention, performed through video-assisted mediastinoscopy, proved successful in the excision of the middle mediastinal ectopic parathyroid gland.

The patient's two-year follow-up in the outpatient clinic revealed consistent measurements of calcium and parathyroid hormone levels within normal limits, indicating the sustained success of the intervention.

These results underscore the efficacy and safety of video-assisted mediastinoscopy as a viable alternative for excising middle mediastinal ectopic parathyroid glands in cases of primary hyperparathyroidism.

Despite limited literature on this approach for middle mediastinal parathyroid adenomas, the findings from this case contribute to the growing body of evidence supporting the use of video-assisted mediastinoscopy in such cases.

Conclusion

In the present case, video-assisted mediastinoscopy (VAM) led to successful resection of the middle mediastinal ectopic parathyroid gland in a 39-year-old male who was diagnosed with primary hyperparathyroidism after presenting with complaints of fatigue, bone pain, and constipation for the past couple of years. There is a lack of literature on the resection of ectopic parathyroid adenomas in the mediastinum using VAM, with only a very small number of reported cases. We conclude that video assisted mediastinoscopy is effective and safe procedure for the excision of ectopic middle mediastinal parathyroid glands.

Patient perspective

The patient shared a positive perspective on his experience with the case. The key elements contributing to the patient's favorable outlook were the effective pain control achieved through a small incision, facilitating a rapid recovery and remarkably short hospital stay. These factors, combined with the resolution of overall symptoms, notably improved the patient's well-being.

Acknowledgments

None

The role played by each co-author

Anas Alshuhayeb (co- author, writing the introduction, review of articles)

Rezk Abogamila (review of articles)

Nada Alrashed (review of articles)

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