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Thoracoscopic parathyroidectomy: a 22-year experience

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Parathyroidectomy is the method of choice for the treatment of primary hyperparathyroidism (pHPT). Removal of hyperfunctioning parathyroid glands provides long-term cure. Nevertheless, some cases present surgical challenges particularly those involving parathyroid adenomas of ectopic localization. The rate of mediastinal parathyroid adenomas is 2—4 % of all cases as described in the literature [1]. It is still unclear, if ectopic parathyroid are more prone to develop functional autonomy. The true prevalence of supernumerary mediastinal glands according to studies on patients with secondary (renal) hyperparathyroidism (sHPT) accounts up for 1 % [2].

In some cases of mediastinally located parathyroid glands, they can be removed via cervical incision, including use of mediastinoscopy, though the definitive criteria have not been developed. However, up to 2.3 % of ectopic parathyroid gland are situated within the aortopulmonary window [3] and, therefore, cannot be removed from cervical approach. This also applies to deeply mediastinal intrathymic glands. For many years, open sternotomy remained the only treatment option for such patients but was associated with significant morbidity. First performed by Prinz in 1994 [4], thoracoscopic parathyroidectomy has gained significance as the preferred surgical method for low-situated mediastinal parathyroid adenomas. In our previous report [5] along with other series [6—16] it has been shown that this approach is feasible, demonstrating a short hospital stay and a low complication rate compared to open sternotomy. Nevertheless, data of this method remain scarce due to the rarity of this condition. We continue to expand our series of cases of thoracoscopic parathyroidectomy to describe our experience and reveal the associated difficulties and prospects.

Objective — to assess the feasibility and safety of thoracoscopic parathyroidectomy in a larg cohort.

MATERIALS AND METHODS

During this study, the medical records of 25 patients who underwent thoracoscopic parathyroidectomy between August 2002 and December 2024 were retrospectively analyzed. Preoperative and postoperative biochemical data, histopathological reports, and surgical protocols were reviewed. Imaging data were also retrospectively assessed when available (16 patients); for the remaining cases, relevant information from medical documentation was included. Of the 25 patients, 14 were male and 11 were female, with a median age of 60 years (range: 27—77 years). Fifteen patients underwent the procedure as a primary surgery for primary hyperparathyroidism (pHPT), seven had persistent pHPT, one had recurrent pHPT, and two were treated for recurrent secondary hyperparathyroidism (sHPT). Two patients had a coronary bypass operation in the anamnesis, while others had no history of previous thoracic surgeries. The median preoperative parathyroid hormone (PTH) level was 200 pg/ml, with a range from 66 to 1800 pg/ml.

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Among patients with pHPT, the median serum calcium level was 3.0 mmol/L (range: 2.36—3.65 mmol/L).

In all cases, the lesions were not detectable by preoperative ultrasound. A total of 18 patients demonstrated positive findings on (99m)Tc-sestamibi (MIBI)-scintigraphy. Among them, 13 had the localization confirmed by 4D Computed tomography (CT), while 5 did not undergo 4D CT. Of these 5 patients, localization was confirmed by magnetic resonance imaging (MRI) in 3 cases, by 11C-Methionine PET/CT in 1 case (with a negative MRI), and by 18F-Choline PET/CT in 1 case. In the group of 3 patients with negative MIBI imaging, localization was confirmed by 4D CT in 2 cases and by 18F-Choline Positron emission tomography (PET/CT) in 1 case (with a negative MRI). Among the 4 patients who did not undergo MIBI imaging, localization was confirmed using different modalities: 1 case with 4D CT, 1 with 11C-Methionine PET/CT, 1 with 18F-Choline PET/CT after negative 4D CT, and 1 with a combination of MRI, 4D CT, and 11C-Methionine PET/CT.

All the operations were performed under general anaesthesia, with a use of a double-lumen endotracheal tube. Patients were placed in the lateral (n = 16) or supine position (n = 10). Usually, the procedures needed two 5-mm trocars and one 10-mm port, an a 5-mm 30 optic. The dissection started using a monopolar hook to open the mediastinal pleura according to preoperative imaging and respecting the phrenic nerves. The vascular pedicle was treated by resorbable clips or — since 2008 — using bipolar coagulation. In cases with clear visualisation of the parathyroid gland, completely thymectomy was not routinely performed. After mobilization, the specimens were placed in a plastic bag and removed through the 10mm port site. Except one case with a parathyroid adenoma in the retroesophageal position, no drain was used. Intraoperative PTH levels were measured 15 minutes after removal. In most cases, surgeries were completed before the blood test results were obtained, with exceptions made in selected cases.

RESULTS

A total of 26 thoracoscopic operations were performed, with 20 from the left side and 6 from the right side of the thorax. Among these, one patient underwent surgery during pregnancy (16th week of gestation). The median duration of surgery was 60 minutes (range: 20—320 minutes). The size of the removed glands ranged from 9 to 35 mm with a median size of 20 mm. In 8 cases, the duration of surgery exceeded 120 minutes, all of which involved lesions located within the thymus in the anterior mediastinum. A significant negative correlation was observed between the size of the lesion and the duration of surgery (p = 0.039).

In 17 cases, the hyperfunctioning glands were located in the anterior mediastinum, embedded within the thymus. The distance from the lower pole of the imaging-suspected lesion to the jugular incisure ranged from 28 mm to 68 mm, with a median distance of 55 mm. Of those, one patient with a history of aortocoronary bypass operation had an adenoma that was situated exactly near the central anastomosis of the aortocoronary bypass vein graft. Four cases involved truly ectopic parathyroid glands. One gland was located in the aortopulmonary window (Fig. 1), while two were near the aortopulmonary window, lateral to the aorta on the surface of the pulmonary trunk. Another gland was paracardial, situated on the right side of the pulmonary trunk (Fig. 2).

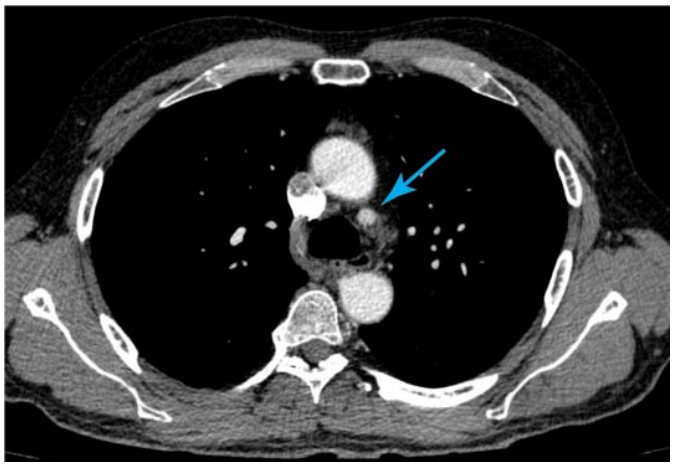

Fig. 1. *4D CT scan of an adenoma in the aortopulmonary window*

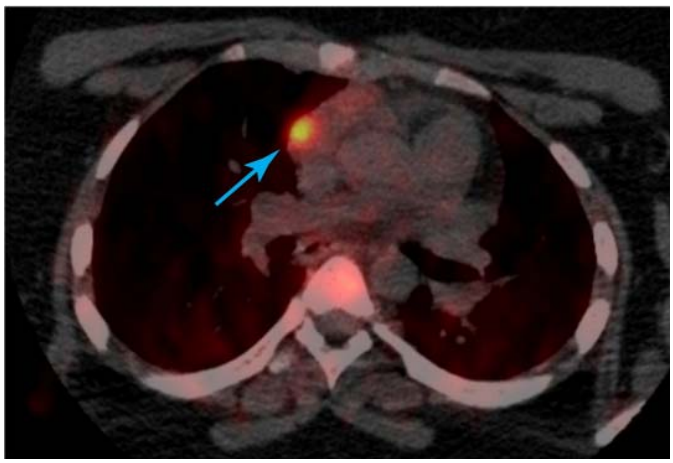

Fig. 2. *PET-CT scan of an adenoma in the paracardiac position*

Additionally, there was one rare case of a deep (distance from jugular incisure — 50 mm) retroesophageal parathyroid adenoma. The known positions of removed parathyroids are schematically depicted on the Fig. 3.

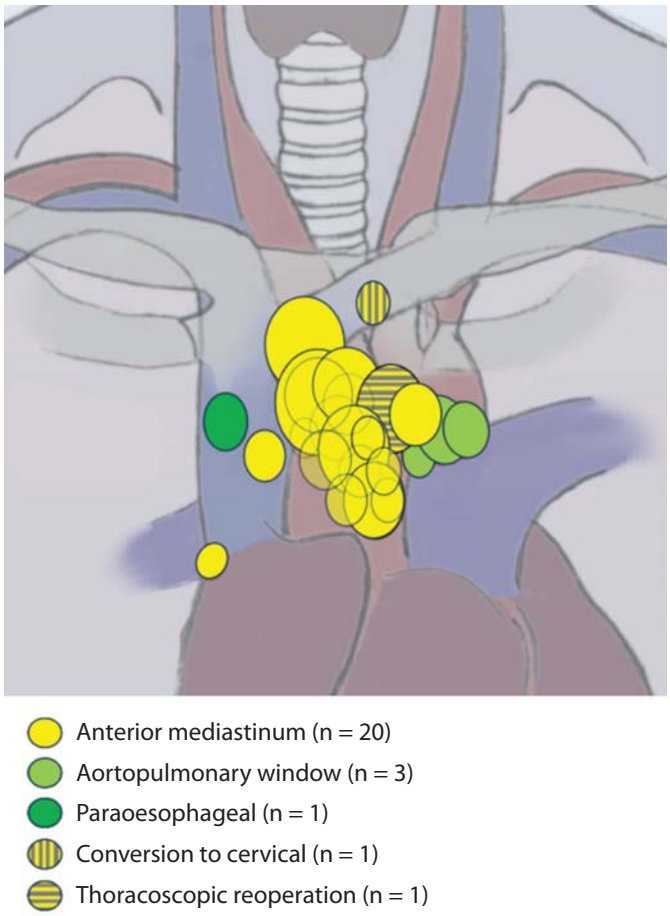

Fig. 3. *Localisation of mediastinal parathyroid glands*

The overall primary success rate was 84.6 %, with four cases in which no hyperfunctioning parathyroid tissue was thoracoscopically removed (Table). In one case, the initial thoracoscopic procedure failed to clearly identify the parathyroid tissue, leading to a thymectomy. The resected tissue was later confirmed to be mediastinal lymph nodes. However, the patient was successfully reoperated by thoracoscopy one year later. The adenoma was located in the anterior mediastinum within the thymus (Fig. 4). In another patient with severe mediastinal adhesions due to coronary bypass surgery the approach was converted successfully to cervical (Fig. 5). Two other patients had biochemically

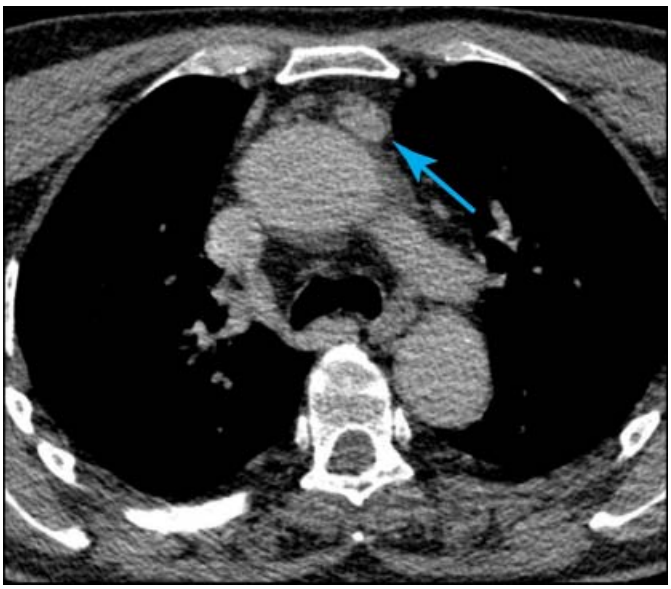

Fig. 4. *4D CT scan of an adenoma which required a thoracoscopic reoperation*

Table

Characteristics of four primary cases without parathyroid tissue in the thoracoscopically removed pathological specimens

Patient's age, years/Gender	Disease	4D CT	MIBI	PET-CT	Mediastinal localisation	Comment
62/Female	pHPT	+	+	–	Anterior mediastinum, thymus	Cured after thoracoscopic re-operation
73/Male	pHPT	–	+	+ (^{11}C methionin)	Anterior mediastinum, thymus	History of aorto-coronary bypass-surgery, mediatinal adhesions, conversion and cure by cervical approach
41/Female	Persistent pHPT	–	–	+ (^{18}F-choline)	Not confirmed by histology	Postop: PTH ↑, Ca normal
77/Female	Recurrent pHPT	–	+	+ (^{18}F-choline)	Not confirmed by histology	Postop: PTH ↑, Ca normal

mild disease, with slightly elevated PTH levels. In one case the operation resulted in normalized calcium levels despite persistent elevated PTH, possibly due to alteration of hyperfunctioning parathyroid tissue caused by mediastinal dissection. The other patient had received calcimimetics preoperatively, exhibited normocalcemia at the time of surgery and after the operation. A retrospective review of PET-CT imaging revealed two suspected lesions: one in the anterior mediastinum and another near the pulmonary trunk. Both were found to be anthracotic lymph nodes (Fig. 6).

There was no conversion to sternotomy or thoracotomy. Mortality was zero and no major complications occurred. Median postoperative hospital stay was 2 days, 7 patients stayed for 3 days postoperatively. Two more patients stayed for 5, and one for 6 days, due to local subcutaneous emphysema and moderate pleural effusion, respectively. No readmissions were registered. The complication rate was 4.2 % including one case of chylothorax cured by retroperitoneoscopic ligation of the thoracic lymphatic duct [17]. Notably, exactly this patient had a sternotomy before and required conversion to a cervical approach. One more patient suffered from a phrenic nerve palsy resolving spontaneously in 3 months.

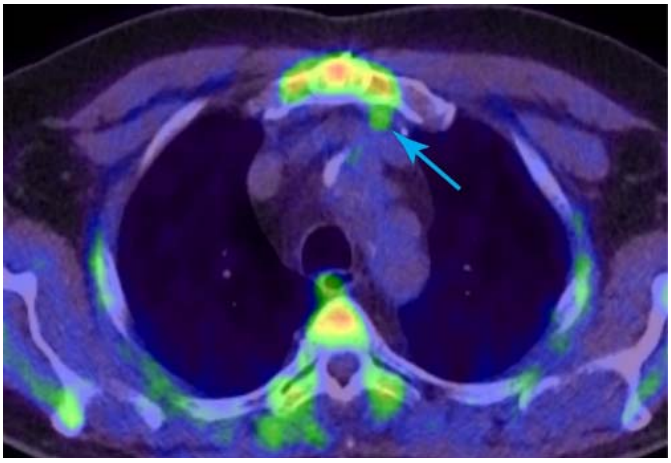

Fig. 5. *PET-CT scan of an adenoma required a conversion to cervical approach*

DISCUSSION

In our series, thoracoscopic parathyroidectomy proved to be a valid and safe method of parathyroidectomy. Most patients had a postoperative hospital stay of no more than three days. Follow-up examinations did not reveal any complications that would significantly impact the postoperative recovery period. Notably, the cases requiring prolonged hospital stay due to medical reasons occurred in 2002 and 2003, likely reflecting the initial learning curve for the procedure. The tendency of shortening of the length of hospital stay underlines the safety of procedure, along with one known report of a performed thoracoscopic parathyroidectomy as an outpatient surgery [18]. No cases of recurrent laryngeal nerve palsy were observed, despite the majority of operations being performed via left-sided thoracoscopy. This highlights the safety of the approach, even without routine intraoperative nerve monitoring (IONM). While IONM is not commonly used in this procedure, it could be a valuable adjunct, enabling better mapping of motor nerves, such as the recurrent laryngeal [19] and phrenic nerves, as we have encountered one case of temporary phrenic nerve palsy. However, it is important to emphasize that

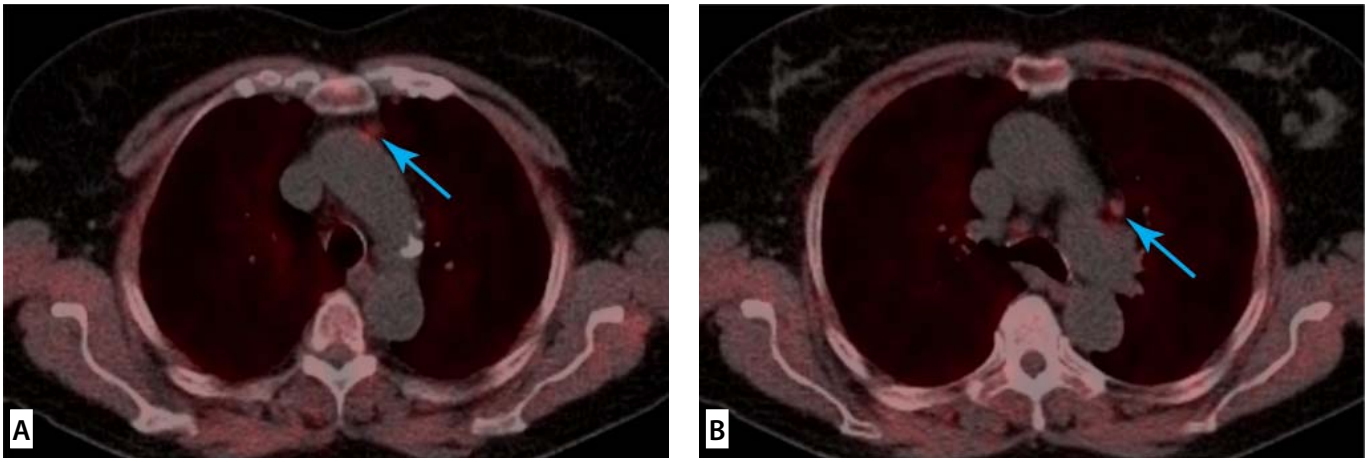

Fig. 6. *PET-CT scan of the lesions suspected for a hyperfunctioning parathyroid in one of the cases without parathyroid tissue in the pathological specimen: lesion in the anterior mediastinum (A), lesion in the anterior mediastinum (B)*

all surgeries were performed by experienced endocrine surgeons with substantial expertise in thoracic surgery. This expertise likely contributed to the low complication rates, though other rare complications should be considered in surgical planning.

The primary cure rate was 84.6 %, with four cases in which no hyperfunctioning parathyroid tissue was thoracoscopically removed, is very similar to that in the some previous studies [6, 7, 14, 16], though the largest series to date, reported by Makey et al., comprised 24 thoracoscopic cases with 96 % primary cure rate and additionaly 4 robotic-assisted thoracoscopic operations with 100 % cure rate [12], along with smaller series with the same excellent results [9]. Nonetheless, it is worth noting that no morbidity was associated with these unsuccessful procedures, which contrasts favorably with the acknowledged risks of repeat cervical surgeries. Even after unsuccessful surgery, minimally invasive reoperations were possible via thoracoscopic or transcervical approaches. This may be particularly relevant for patients with secondary hyperparathyroidism or familial forms of pHPT, who may require subsequent neck surgeries. Thus, the indications for thoracoscopic surgery should not be strictly limited to cases with glands located in the lower mediastinum. The variety of thoracic localizations successfully addressed in this study including anterior and posterior mediastinum, paracardial areas, and the aortopulmonary window highlights the versatility of the thoracoscopic approach.

An unexpected observation in our cohort was the predominance of male patients in the subgroup of pHPT patients, which contrasts with the typical gender distribution in pHPT. One potential explanation is that anatomical factors often lead to female patients being selected for transcervical operations in cases of borderline-low gland localization within the thymus tongue. However, this does not fully explain why three out of four patients with aortopulmonary glands were male. This raises the possibility of a constitutional predisposition in males to develop mediastinally located parathyroid adenomas. While defining an objective cutoff for gland depth is challenging, thoracoscopic surgery remains a viable and effective treatment option for these cases.

CONCLUSIONS

In summary, thoracoscopic parathyroidectomy is a safe and effective method for managing mediastinal parathyroid adenomas. The procedure offers significant advantages, including short hospital stays and low complication rates, compared to open approaches. Despite challenges in intraoperative localization, this method provides a versatile and minimally invasive option for patients with mediastinal parathyroid adenomas.

Conflicts of interest. *The authors declare that there is no conflict of interest and no financial interest in the preparation of this article.*

Authorship contributions: *conception and design, analysis and interpretation of data, critical revision of the article — D. Buzanakov, M. K. Walz; acquisition of data, drafting the article — D. Buzanakov, P. F. Alesina, P. Kniazeva.*

REFERENCES

1. Taterra D, Wong LM, Vikse J, Sanna B, Pękala P, Walocha J, Cirocchi R, Tomaszewski K, Henry BM. The prevalence and anatomy of parathyroid glands: a meta-analysis with implications for parathyroid surgery. Langenbecks Arch Surg. 2019 Feb;404(1):63-70. doi: 10.1007/s00423-019-01751-8. Epub 2019 Feb 14. PMID: 30762091; PMCID: PMC6394670.
2. Hibi Y, Tominaga Y, Sato T, Katayama A, Haba T, Uchida K, Ichimori T, Numano M, Tanaka Y, Takagi H, Imai T, Funahashi H, Nakao A. Reoperation for renal hyperparathyroidism. World J Surg. 2002 Oct;26(10):1301-7. doi: 10.1007/s00268-002-6731-8. Epub 2002 Sep 4. PMID: 12205559.
3. Arnault V, Beaulieu A, Lifante JC, Sitges Serra A, Sebag F, Mathonnet M, Hamy A, Meurisse M, Carnaille B, Kraimps JL. Multicenter study of 19 aortopulmonary window parathyroid tumors: the challenge of embryologic origin. World J Surg. 2010 Sep;34(9):2211-6. doi: 10.1007/s00268-010-0622-1. PMID: 20523997.
4. Prinz RA, Lonchyna V, Carnaille B, Wurtz A, Proye C. Thoracoscopic excision of enlarged mediastinal parathyroid glands. Surgery. 1994 Dec;116(6):999-1004; discussion 1004-5. PMID: 7985108.
5. Alesina PF, Moka D, Mahlstedt J, Walz MK. Thoracoscopic removal of mediastinal hyperfunctioning parathyroid glands: personal experience and review of the literature. World J Surg. 2008 Feb;32(2):224-31. doi: 10.1007/s00268-007-9303-0. PMID: 18064517.
6. Isaacs KE, Belete S, Miller BJ, Di Marco AN, Kirby S, Barwick T, Tolley NS, et al. Video-assisted thoracoscopic surgery for ectopic mediastinal parathyroid adenoma. BJS Open. 2019 Aug 19;3(6):743-749. doi: 10.1002/bjs5.50207. PMID: 31832580; PMCID: PMC6887896.
7. Du H, Shi M, Zhu L, Che J, Hang J, Chen Z, Li H. Comparison of video-assisted thoracic surgery with open surgery in the treatment of ectopic mediastinal parathyroid tumors. J Thorac Dis. 2017 Dec;9(12):5171-5175. doi: 10.21037/jtd.2017.11.60. PMID: 29312723; PMCID: PMC5757062.
8. Said SM, Cassivi SD, Allen MS, Deschamps C, Nichols FC 3rd, Shen KR, Wigle DA. Minimally invasive resection for mediastinal ectopic parathyroid glands. Ann Thorac Surg. 2013 Oct;96(4):1229-1233. doi: 10.1016/j.athoracsur.2013.05.084. Epub 2013 Aug 20. PMID: 23968765.
9. Iacobone M, Mondi I, Viel G, Citton M, Tropea S, Frego M, Favia G. The results of surgery for mediastinal parathyroid tumors: a comparative study of 63 patients. Langenbecks Arch Surg. 2010 Sep;395(7):947-53. doi: 10.1007/s00423-010-0678-2. Epub 2010 Jul 10. PMID: 20623135.

10. Iihara M, Suzuki R, Kawamata A, Horiuchi K, Okamoto T. Thoracoscopic removal of mediastinal parathyroid lesions: selection of surgical approach and pitfalls of preoperative and intraoperative localization. World J Surg. 2012 Jun;36(6):1327-34. doi: 10.1007/s00268-011-1404-0. PMID: 22205108.
11. Amer K, Khan AZ, Rew D, Lagattolla N, Singh N. Video assisted thoracoscopic excision of mediastinal ectopic parathyroid adenomas: a UK regional experience. Ann Cardiothorac Surg. 2015 Nov;4(6):527-34. doi: 10.3978/j.issn.2225-319X.2015.09.04. PMID: 26693148; PMCID: PMC4669253.
12. Makey IA, Geldmaker LE, Casler JD, El-Sayed Ahmed MM, Jacob S, Thomas M. Localization and surgical approach to mediastinal parathyroid glands. J Cardiothorac Surg. 2022 Dec 7;17(1):299. doi: 10.1186/s13019-022-02052-w. PMID: 36476282; PMCID: PMC9730602.
13. Liu L, Zhang JQ, Wang GG, Zhao K, Guo C, Huang C, Li SQ, Chen YY. Surgical Treatment of Ectopic Mediastinal Parathyroid Tumors: A 23-Year Clinical Data Study in a Single Center. J Invest Surg. 2022 Oct;35(10):1747-1753. doi: 10.1080/08941939.2022.2106392. Epub 2022 Aug 1. PMID: 35914896.
14. Wei B, Inabnet W, Lee JA, Sonett JR. Optimizing the minimally invasive approach to mediastinal parathyroid adenomas. Ann Thorac Surg. 2011 Sep;92(3):1012-7. doi: 10.1016/j.athoracsur.2011.04.091. PMID: 21871292.
15. Lu HI, Chou FF, Chi SY, Huang SC. Thoracoscopic removal of hypertrophic mediastinal parathyroid glands in recurrent secondary hyperparathyroidism. World J Surg. 2015 Feb;39(2):400-9. doi: 10.1007/s00268-014-2797-3. PMID: 25245433.
16. Randone B, Costi R, Scatton O, Fulla Y, Bertagna X, Soubrane O, Bonnichon P. Thoracoscopic removal of mediastinal parathyroid glands: a critical appraisal of an emerging technique. Ann Surg. 2010 Apr;251(4):717-21. doi: 10.1097/SLA.0b013e3181c1cfb0. PMID: 19858697.
17. Seeliger B, Alesina PF, Walz MK. Posterior retroperitoneoscopic thoracic duct ligation: a novel surgical approach. Surg Endosc. 2018 Aug;32(8):3732-3737. doi: 10.1007/s00464-018-6262-5. Epub 2018 May 31. PMID: 29855711.
18. Chae AW, Perricone A, Brumund KT, Bouvet M. Outpatient video-assisted thoracoscopic surgery (VATS) for ectopic mediastinal parathyroid adenoma: a case report and review of the literature. J Laparoendosc Adv Surg Tech A. 2008 Jun;18(3):383-90. doi: 10.1089/lap.2007.0124. PMID: 18503371.
19. Seong YW, Chai YJ, Lee JM, Ok YJ, Oh SJ, Choi JS, Moon HJ. Continuous vagal intraoperative neuromonitoring during video-assisted thoracoscopic surgery for left lung cancer: its efficacy in preventing permanent vocal cord paralysis. Interact Cardiovasc Thorac Surg. 2022 Nov 8;35(6):ivac273. doi: 10.1093/icvts/ivac273. PMID: 36448697; PMCID: PMC9728793.

ABSTRACT

Thoracoscopic parathyroidectomy (TP) is a preferred approach to the treatment of hyperparathyroidism (HPT), caused by hyperfunctioning parathyroid glands located in mediastinum, though the data on its feasibility and safety are scarce, due to the rarity of this condition.

Objective — to assess the safety and feasibility of thoracoscopic parathyroidectomy.

Materials and methods. A retrospective cohort included 25 patients (14 male, 11 female) of primary thoracoscopic parathyroidectomy performed in Kliniken Essen-Mitte and Wuppertal Helios Hospital from August 2002 to December 2024. Out of the patients included in the study, 15 patients underwent TP as their initial operation for primary HPT (pHPT), 7 patients had persistent pHPT after cervical operations, one — recurrent pHPT, and two — recurrent secondary HPT. Median age was 60 years (range: 27—77 years). The mediastinal location of the parathyroid was suspected by (99m)Tc-sestamibi (MIBI)-scintigraphy in 18 cases, five cases were MIBI-negative, and in two cases, no MIBI-scintigraphy was performed. In all cases, parathyroid localization was confirmed by 4D Computed tomography (CT) scan (n = 17), magnetic resonance imaging (MRI) (n = 3) or Positron emission tomography (PET-CT) (n = 5). Pre- and postoperative levels of serum calcium and parathormone, histopathological reports, and surgery protocols were analyzed. Intraoperative parathyroid hormone (PTH) level was measured with a rapid assay to confirm the success of the procedure 15 minutes after resection.

Results. During the investigated period, 26 thoracoscopic operations were performed. Overall success rate was 84.6 % as in 4 cases no hyperfunctioning parathyroid tissue was thoracoscopically removed. In the first case, a cervical approach was required; in the second one, the patient was reoperated thoracoscopically one year later; in the third case, the operation resulted in the normalization of serum calcium level despite the absence of parathyroid tissue in the pathological specimen. In one more case, the patient demonstrated postoperatively elevated PTH level with normal serum calcium level. Median duration of operations was 80 minutes (range: 20—320 minutes). No perioperative deaths or major complications occurred. No conversion to sternotomy or thoracotomy was performed. A complication rate was 4.2 %, including one case of chylothorax, followed by a successful retroperitoneoscopic ligation of the thoracic lymphatic duct, and one case of temporary phrenic palsy. Median postoperative hospital stay was 2 days (range 2—6 days). No readmissions due to any reasons after discharge were registered.

Conclusions. Thoracoscopic parathyroidectomy is safe and feasible, being the optimal treatment option in most cases of mediastinal parathyroid adenomas. However, it requires precise preoperative localization to guarantee the success of the treatment.

Keywords: hyperparathyroidism, parathyroid glands, mediastinum, thoracoscopic parathyroidectomy.

РЕЗЮМЕ

Торакоскопічна паратиреоїдектомія: 22-річний досвід

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Торакоскопічну паратиреоїдектомію (ТП) розглядають як кращий підхід до лікування первинного гіперпаратиреозу, спричиненого гіперфункцією прищитоподібних залоз, розташованих у середостінні. Даних про її доцільність і безпечність недостатньо через незначну частоту цього захворювання.

Мета роботи — оцінити безпечність і доцільність проведення торакоскопічної паратиреоїдектомії.

Матеріали та методи. Проведено ретроспективний аналіз даних 25 пацієнтів (14 чоловіків, 11 жінок), яким була проведена ТП у Kliniken Essen-Mitte та Wuppertal Helios Hospital у період із серпня 2002 р. до грудня 2024 р. Як початкову операцію з приводу первинного гіперпаратиреозу ТП проведено 15 пацієнтам. У 7 пацієнтів зареєстровано гіперпаратиреоз, що персистує, після операції на шийці матки, у 1 — гіперпаратиреоз, що рецидивує, у 2 — вторинний гіперпаратиреоз. Середній вік хворих становив 60 років (діапазон: 27—77 років). Медіастинальне розташування прищитоподібної залози запідозрено при проведенні метокси-ізобутил-ізонітрил (МІБІ)-сцинтиграфії у 18 випадках. У 5 пацієнтів показники МІБІ-сцинтографії були негативні, у 2 МІБІ-сцинтиграфію не проводили. У всіх випадках локалізація прищитоподібної залози була підтверджена комп'ютерною томографією в режимі 4D (n = 17), магнітно-резонансною томографією (n = 3) або позитронно-емісійною комп'ютерною томографією (n = 5). Проаналізовано показники сироваткового кальцію та паратгормону до та після операції, гістопатологічні звіти й протоколи операції. Інтраопераційний рівень паратгормону вимірювали за допомогою швидкого аналізу, щоб підтвердити ефективність процедури через 15 хв після резекції.

Результати. За досліджуваний період виконано 26 торакоскопічних операцій. Загальний показник ефективності операцій становив 84,6 %, оскільки в 4 випадках торакоскопічно не видаляли тканину прищитоподібної залози, що гіперфункціонує. У першому випадку потрібен був шийний доступ, у другому через рік проведено повторну операцію з торакоскопічним підходом, у третьому випадку операція сприяла нормалізації рівня кальцію в сироватці крові, незважаючи на відсутність тканини прищитоподібної залози в цитологічному препараті, у четвертому випадку зареєстровано післяопераційне підвищення рівня паратгормону за нормального вмісту кальцію в сироватці крові. Середня тривалість операцій становила 80 хв (20—320 хв). Післяопераційних випадків смерті або серйозних ускладнень не зафіксовано. Випадків проведення стернотомії або торакотомії не було. Частота ускладнень становила 4,2 %, зокрема один випадок хілотораксу з наступним успішним ретроперитонеоскопічним перев'язуванням грудної лімфатичної протоки та один випадок тимчасового діафрагмального паралічу. Середня тривалість післяопераційного перебування в лікарні становила 2 дні (від 2 до 6 днів). Повторних госпіталізацій з будь-яких причин після виписки не зареєстровано.

Висновки. Торакоскопічна паратиреоїдектомія є безпечною та доцільною, оскільки є оптимальним варіантом лікування в більшості випадків медіастинальної аденоми прищитоподібних залоз, але потребує точного визначення доопераційної локалізації, щоб гарантувати успіх лікування.

Ключові слова: гіперпаратиреоз, прищитоподібні залози, середостіння, торакоскопічна паратиреоїдектомія.

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