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Introducing a very rare case of intra-pericardial thyroid tissue with blood supply from the aortic arch in a patient with renal cell carcinoma: A case report and review of the literature

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Abstract

Intra-pericardial heterotopic thyroid (IPHT) is an incidental finding during open-heart surgery. Although heterotopic thyroid has been reported in different parts of the body, only a few cases of intra-pericardium have been reported so far. In most articles, intracardiac, intrathoracic and heterotopic thymus cases are mistakenly included as IPTH cases A 57-year-old man with a history of non-Hodgkin lymphoma, who was treated 8 years ago and recovered, is now a candidate for surgery due to clear cell renal carcinoma in the left kidney with inferior vena cava (IVC) thrombus tumor that has spread into the right atrium. At the same time, he was operated on by two teams of urology and heart surgery. The patient's kidney was removed, and then he was subjected to sternotomy by the heart surgery team to remove the thrombus tumor. After opening the pericardium inside the pericardial cavity, a pericardial mass measuring 1×2 ×3 cm, which was connected to the lower surface of the aortic arch by a 1 cm long stalk, was observed. It was resected and sent to pathology laboratory. The rest of the surgery to remove the thrombus tumor from inside the right atrium and IVC continued according to the procedure. The pathological report was benign thyroid tissue. Actual cases of IPTH are underreported, and due to the small number, it is not yet possible to comment on the prevalence of malignancy in it or its functional role; However any lesion or abnormal mass in the pericardial cavity should be respected and sent to pathology laboratory therefore by collecting information about these masses, in the future, decisions can be made and summarized.

Keywords: Intra pericardial mass, Intra pericardial thyroid, Ectopic thyroid tissue, Renal cell carcinoma, Cardiac surgery

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Introduction

Intra-pericardial heterotopic thyroid (IPTH) is an incidental finding in most cases (1-3). Heterotopic thyroid has been reported in various parts of the body, but IPTH has rarely been reported. With a careful search and review, it was found that only a handful of cases of IPTH have been reported so far, and the rest are intracardiac heterotopic thyroid cases, which are mistakenly taken as synonyms of IPTH and reported.

Intra-pericardium masses can be caused by tumors, metastasis (4), cystic lesions (5), or heterotopic thymus (6-8), which are not classified as IPTH. Furthermore, mediastinal ectopic goiter, a thyroid tissue located in the vicinity of the thymus and extends downward from the level of the first thoracic vertebra, supra sternal notch, is classified as intra thoracic ectopic goiter (9,10), and it does not belong to IPTH category.

By carefully reviewing the published articles, it was found that three types of heterotopic thyroid tissue have been reported in the heart. One type, which is also the most common, is intracardiac heterotopic thyroid, in which the thyroid tissue is located in different parts of the heart wall, such as the interventricular septum (9). The second group is the thyroid tissue that has expanded from the neck into the mediastinum because of the abnormal size of the thyroid and is often symptomatic due to the compressive effect (10), and the third group is IPTH, which is thyroid tissue that in addition to normal cervical thyroid, is located separately and abnormally in the pericardial cavity and its blood flow is from a vascular branch from the aorta or surrounding tissues (1-3). Excluding the first two groups, it became clear that only a

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Implication for health policy/practice/research/ medical education

- Remove any abnormal mass inside the pericardium.
- Intra pericardial heterotopic thyroid is often an incidental finding.
- Due to the small number of reported cases in the world, it is still not possible to provide a final and complete summary about this.

few cases of IPTH have been reported so far. We report an extremely rare case of intrapericardial heterotopic thyroid and review similar articles.

Case Presentation

A 57-year-old man with a history of high grade diffuse non-Hodgkin lymphoma, based on cervical mass biopsy that was performed 8 years ago, high grade large B cell (CD20, positive), KI16 more than 60% proliferative index (CD3, negative) lymphoma, had been treated and improved. he presented 8 years later with the feeling of a mass in the flank, and in the examinations, we found a right kidney tumor and renal thrombus tumor with an extension to the inferior vena cava (IVC) and the opening of right atrium.

Before the surgery, the patient's thyroid function tests were normal. Two separate but simultaneous teams treated the patient. First, the patient's kidney was operated by the urology team, and then, the patient underwent sternotomy by the heart surgery team. Thymectomy was performed during the heart surgery procedure. The pericardium was opened, and a pericardial mass measuring 1×2×3 cm was connected to the surface of the ventricle part of the aortic arch by a stalk about 1 cm long. It was completely mobile and was supplied with blood through the same stalk. The mass had a smooth and encapsulated surface. The mass was resected and sent for pathology (Figure 1; Supplementary files 1 and 2), then the surgery continued according to the procedure. The IVC control was removed. Then the operation was terminated and the patient was transferred to the ICU. The pathology answer of the left kidney mass was clear cell renal cell carcinoma with dimensions of 10×10×6 cm and grade 3. The pathology answer of tumor thrombosis was as follows; vascular structural involved by clear cell renal cell carcinoma, and the pathology result of the intra pericardial mass was as follows: benign thyroid tissue.

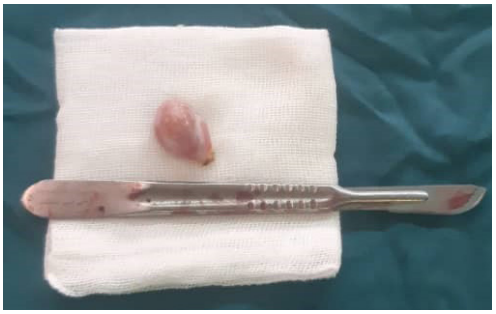

Figure 1. Gross photograph of mass.

Discussion

The reason for the presence of ectopic thyroid tissue in the pericardial cavity, either intrapericardial or intracardiac, is due to the close development of the thyroid gland and the heart system, which is well described by Rogers and Kasten in their article (11). Although IPTH is often seen in mammals, it is rare in humans. In a study that investigated 45 dogs, 29 cases had intra-pericardial thyroid tissue originating from the ascending aorta (12). The first reported case of IPTH in German literature was in 1942, which was found incidentally in a 67-year-old woman who died of peritonitis. After examining the pericardium of the deceased, they noticed a lesion in the pericardium, which was autopsied, and the pathology result showed that it was typical thyroid tissue (1).

The second reported case of IPTH was in 1997, which was incidentally found during autopsy in a 93-year-old man who died due to aspirated pneumonia. Its dimensions were 3.5× 3.5×4.5cm, it originated from the anterior surface of the aorta and was covered with fibrosis and white in color (2). In 2016, a 47-year-old woman who presented with symptoms of dyspnea and angina underwent surgery due to the pressure effect of a mass on the left atrium. This mass was supplied by two vessels from the left circumflex artery . The size of the mass was 5×4×4 cm, and its pathological answer was thyroid adenoma without evidence of malignancy (3). It is predicted that 15% of ectopic thyroid cases are associated with malignancy (13). However, due to the low number of IPTH, no malignant cases have been reported yet.

We emphasize that cases of intracardiac thyroid malignancy have been reported (14), but no case of intrapericardial thyroid.

Table 1 shows a summary of IPTH cases (we emphasize again and remind that the cases of intra thoracic ectopic goiter, intracardiac thyroid, and ectopic thymic tissue (6 and 15), which are not in the IPTH classification, have been excluded.

Removal of tumor thrombus kidney masses that have spread into the atrium and heart are treated and evacuated as described in this article (16).

Conclusion

Due to the small number of reported cases of IPTH, it is still not possible to make general and comprehensive conclusions about such cases. Most of these cases have been found by chance and have been resected. It cannot be recommended that all abnormal cases in the pericardial cavity should be respected and removed in order to compile a complete guide in this field by collecting their information.

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Authors' contribution

Conceptualization: MH.

Table 1. Cases of IPHT in the articles[a]

First Author	Year	Gender	Age	Type of presentation	Size	Pathology answer
Odstreli (1)	1942	Female	67	Incidental	_	Normal thyroid tissue
Lewis (2)	1977	Male	93	Incidental	3.5×3.5×4.5 cm	Normal thyroid tissue
Lewis(3)	2016	Female	47	Dyspnea	5×4×4 cm	Thyroid adenoma
Hekmat (present)	2022	Male	57	Incidental	3×2×1 cm	Normal thyroid tissue

[a] This article only reviews cases of IPTH, cases of intra- cardiac thyroid tissue, intra thoracic ectopic goiter, and ectopic thymic tissue, which are not included in this classification, have been excluded.

Methodology: HG.
Validation: ZAA.
Formal analysis: MH.
Investigation: HG.
Resources: RT.
Data curation: SAM.
Writing—original draft preparation: HG.
Writing—review and editing: ZAA.
Visualization: RT.
Supervision: HG.
Project administration: MH.
Funding acquisition; SAM.

Conflicts of interest

The authors declare that they have no competing interests.

Ethical issues

The authors have observed ethical issues, including no plagiarism, no data fabrication, and no double publication. The patient gave informed consent for the publication of his data.

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None.

Supplementary files

Supplementary file 1: Video 1. Gross photography during surgery, when the pericardium was opened. In front of the aorta, under the arch of the aorta, a mass measuring 1× 2× 3cm is observed, which is connected by a stalk.

Supplementary file 2: Video 2. The cut form of the mass, the benign thyroid mass, which has a soft consistency and is brown in color, can be seen.

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