PATHOLOGICAL COMPARATIVE ASSESSMENT OF TWO CASES OF THYMIC CYST AND CYSTIC THYMOMA AND REVIEW OF THE LITERATURE

Doina Butcovăn¹, Gr. Tinica², Cipriana Stefanescu³, Lidia Ionescu²
University of Medicine and Pharmacy ”Grigore T. Popa” - Iasi
Faculty of Medicine
1. Pathology Department;
2. Surgery Department;
3. Nuclear Medicine Department.

PATHOLOGICAL COMPARATIVE ASSESSMENT OF TWO CASES OF THYMIC CYST AND CYSTIC THYMOMA AND REVIEW OF THE LITERATURE (Abstract): Cystic changes of the thymus are rare lesions. In addition to their appearance in non-neoplastic congenital and acquired conditions, they have been seen in association with certain malignancies of the thymus. Our aim is to highlight the possibility of confusing between benign and malignant thymus cysts having different cure approach. We report two thymic cyst cases, one congenital ectopic condition, and the other one, a cystic thymoma. Investigations included blood counts, echograms, and computed tomography. The cysts were excised by mediastinal route and examined pathologically. The final diagnosis was made only after histopathological examination of the surgery biopsy revealing two types of cystic thymic lesions: congenital and tumoral. Because thymic cysts may present malignant transformation, they represent a diagnostic challenge that is resolved only by surgical excision and histological examination. Due to cystic changes masking tumoral features in these cases, thorough sampling is required to ensure that a malignancy is not overlooked. **Key words:** THYMIC CYST, CYSTIC THYMOMA, MESOTHELIAL CYST

Thymic cysts are regarded as rare anomalies (1); they may occur at any anatomic level, from the base of the neck to the diaphragm. There is some controversy receiving the causes of thymic cysts. According with Speers (2) thymic cysts represents different entities: congenital, inflammatory and neoplastic. Congenital cysts can be found along the anatomical course of the third pharyngeal pouch, inflammatory cysts may be due to an acquired inflammatory process (3, 4, 5), and neoplastic cysts (6, 7) are more frequently in larger tumors than in smaller ones, resulting by cystic degeneration of the tumors. Suster and Rosai (8) reported 18 cases of multilocular thymic cysts, in addition to unilocular cysts, most of the cases represented by congenital or acquired inflammatory cysts, and some of them were related to neoplasms. In any case, local disruption of thymic tissue can induce the formation or growth of cysts. In the current paper, we make a comparative pathological discussion between the two thymic cysts: the first, a thymic cyst of congenital origin,
and the second, a cystic mass of neoplastic origin, represented by a cystic thymoma.

**CASE PRESENTATIONS**

**Case 1.**
An asymptomatic 23-year-old man was referred to our hospital with a suspicion of “pericardial cyst” based on chest echocardiography made few months ago. The family history was non-contributory and the past personal history contained no episodes of pneumonia, pleurisy or chest pain. Laboratory data and ECG were normal. Chest X ray demonstrated a mass located in the anteroposterior mediastinum. Echocardiography exam showed a cyst structure located adjacent to the right atrium, measuring about 7 x 4 x 6 cm. There was no pericardial fluid, intracavitary thrombus and pulmonary hypertension. The results of computed tomography (CT) of the chest consisted in a cystic mediastinal mass with a definite, thick, fibrous capsule and fluid content. Cyst resection was recommended because of the cyst’s large size and the high possibility of compression to the right atrium.

Following surgical operation, macroscopic examination revealed a well-encapsulated bilocular (fig. 1) thick-walled cystic mass with serous fluid content. Histopathological examination of the cyst revealed that its inner surface was lined with columnar epithelium, with thymic elements in the fibrous wall (fig. 2) and small foci of normal thymus (fig. 3) outside the cyst. From these histological findings, the patient was morphologically diagnosed with congenital thymic cyst. The patient left the hospital in good conditions and the postoperative evolution was favorable.

![Fig. 1- Encapsulated cystic mass; Fig. 2 - Thymic elements in the fibrous wall (HE, x20); Fig. 3 - Small external foci of normal thymus (HE, x10).](image_url)

**Case 2.**
A 41 year old man with no significant past history was diagnosed, in 2002, on a routine chest X-ray with a left pleuropericardial mass. Subsequently, a CT scan showed a normal thymic region and a well defined antero-inferior mediastinal mass of 50/58/39 mm with areas of attenuation suggestive of cystic lesion, which was considered at that time, a pleuropericardial
cyst. After seven years, in January 2009, the patient was diagnosed in Neurological Hospital with myasthenia gravis, Osserman clinical stage IIB. A repeat thorax CT scan (fig.4) showed a bigger mass of 60/60/53 mm, that was inhomogeneous and well encapsulated situated between the pericardium and left inferior mediastinal pleura. Surgical exploration revealed a large cyst measuring approximately 6 cm in greatest dimension (fig.5). On cut section, it was a large cystic mass with less solid areas. The cut surface revealed grayish pink irregular nodules on the inner surface and almost the entire tumor was cystic and filled incompletely with soft yellow gelatinous material (fig. 6).

Pathologically, we found a large cystic tumor and a normal involuted thymic tissue was present outside of the wall (fig. 7). The cyst wall was composed of hyaline fibrous tissue and was lined inside by tumoral areas and eosinophilic debris, representing extensive areas of necrosis.

Microscopical examination of the solid areas showed tumoral lobules (fig. 8) separated by fibrous bands and perivascular spaces (fig. 9). The lobules were composed of a dual population of cells typical of thymoma, including small lymphocytes and larger epithelioid cells with round to oval nuclei surrounded by abundant slightly eosinophilic cytoplasm. There was no evidence of nuclear pleomorphism or mitotic activity of the epithelioid cells.

The capsule (fig. 10) was thickened and fibrotic, presenting focally, adjacent cholesterol clefts and foamy cells. Vestiges of lymphoid tissue were present in the wall. Examination of multiple sections did not reveal any evidence of invasion through the capsule, except a point of incomplete infiltration (fig. 11) of it, where the tumor point was too small to assess capsular invasion. Indeed, there was no evidence of capsular invasion or microscopic foci in the medias-
Pathological comparative assessment of two cases of thymic cyst and cystic thymoma

tinal fat. There were no signs of the tumor infiltration in the lung or any other adjacent structures, as well.

Pathology was consistent with type AB thymoma according to World Health Organization Classification or mixt thymoma according to traditional schema. On the basis of these histological findings, the cystic mass was identified as an encapsulated, well differentiated thymoma, stage I Masaoka, with secondary necrotic and cystic changes.

**DISCUSSION AND CONCLUSIONS**

Thymic cysts are relatively uncommon, but their numbers are increasing with the advent of new imagistic modalities of diagnosis, such as CT and MRI. They are most commonly classified into congenital or acquired, including neoplastic cysts (1-4). An important issue is the differentiation between thymic cysts and cystic thymomas.

**Thymic cysts** are believed to represent different entities, congenital, inflammatory and neoplastic cysts (9). Congenital, most of the thymic cysts can be explained as sequestrated remnants of the thymopharyngeal duct system (3). Suster and Rosai consider that the origin of thymic cysts seems to be: congenital, due to the induction of cystic transformation of ductal epithelium of the thymopharyngeal duct system or acquired, being related by an acquired inflammatory process (10). These cystic spaces are also interpreted as degenerative, probably resulting from liquefactive necrosis or fluid accumulation secondary to hemorrhage. The inflammation is a reactive process.

The same authors consider that diagnosis of inflammatory cysts may be difficult due to cystic changes and degenerative nature of these tumors. Degeneration of thymic cysts may reduce the identifiable thymic tissue, therefore extensive microscopic sampling is important.

Thymic cysts are rare and the etiopathogenesis of these benign cysts is still controversial. But, their removal is often easy and the diagnosis is confirmed by the presence of Hassall's corpuscles in the cyst wall.
Cystic changes in thymoma may be the result of two pathogenetic mechanisms: (a) confluence and dilatation of perivascular spaces with creation of large cystic cavities devoid of an epithelial lining or inflammation, and (b) cystic dilatation of Hassall's corpuscles secondary to underlying inflammatory changes of residual non-neoplastic thymic epithelium (11). Our case illustrates a secondary necrotic event that may supervene in thymoma that can obscure the main underlying pathological process.

Sometimes, it may be impossible to determine whether the cystic changes supervened in a preexisting thymoma (cystic transformation of the thymoma) or whether the thymoma, developed secondarily, represents an incidental finding in a thymic cyst (12). In our case, thymoma was found as mural nodules attached to the wall of the thymic cyst, pointing an initial thymoma with secondary cystic transformation.

In thymomas, more important than tumoral subtyping is to make a correct diagnosis of malignancy for avoiding confusion with other types of anterior mediastinal cystic lesions. Moreover, the most important prognostic factor of the thymomas, remain the status of capsular integrity. Adequate inking of the outer surface of the specimen and extensive sampling of the capsule are therefore of primary importance for the evaluation of these tumors.

REFERENCES