DE GRUYTER
OPEN

ПРИЛОЗИ. Одд. за мед. науки, XXXVIII 2, 2017
CONTRIBUTIONS. Sec. of Med. Sci., XXXVIII 2, 2017

МАНУ
MASA

10.1515/prilozi-2017-0032

ISSN 1857-9345
UDC: 616.27-006.2

CASE REPORT

GIANT MEDIASTINAL THYMIC CYST

Goran Kondov[1], Borislav Kondov[1], Marija Jovanovska Srceva[2], Goge Damjanovski[3], Imran Ferati[4], Ivan Karapetrov[4], Irena Kondova Topuzovska[5], Nikolina Tanevska[6], Anita Kokareva[2]

[1] University Clinic for Thoracic and Vascular Surgery, Medical Faculty Skopje,
[2] University Clinic for Anesthesia Reanimation and Intensive Care, Medical Faculty Skopje,
[3] PZU Megamed, Skopje,
[4] Clinical Hospital, Tetovo,
[5] University Clinic for Infectious Diseases and Febrile Conditions, Medical Faculty Skopje,
[6] University Clinic for Neurology, Medical Faculty Skopje

Corresponding author: Prof. Dr. Kondov Goran, MD, PhD. University Clinic of Thoracovascular Surgery, Clinical Centre, Medical Faculty, Mother Tereza 17, 1000 Skopje, R. Macedonia, Tel.: 00389 70 252 010, E-mail: kondov@yahoo.com

ABSTRACT

The authors present a rare case of giant mediastinal cyst which arises from the thymus gland, and goes down in both pleural spaces, especially in the right chest cavity where a dominant part of the cyst was present. The cyst was full with 2.5 liters of transparent fluid, and compressed surrounding structures – heart and both lungs, especially the right one which was partially collapsed.

The patient was a 52 years old woman, without any clinical symptoms. Accidentally, on the screened chest X-ray a shading in the distal third of the right chest was detected.

The case was well documented with a CT of the chest, and an indication for surgical treatment was made. The surgery was done successfully in general anesthesia according to the small right anterior thoracotomy from which a giant part of the cyst was mobilized, which was in the right pleural cavity, but, also, the thymus with the origin of the cyst in the anterior and superior mediastinum was completely removed. In the end, a part of the cyst which was in the left pleural cavity was removed.

Key words: mediastinal cyst, thymic cyst, surgical treatment

INTRODUCTION

Mediastinal cyst is a rare pathological finding in the mediastinum, estimated in 15-20% of all mediastinal tumors, especially the thymic cysts, which were detected in only 2-3%. [1-6] Knowing that the thymus gland appears from the 3rd pharyngeal punch in the embryo, the thymic cyst can be found on the neck but also in the mediastinum where in the end finishes the placing of the thymus gland, but it is possible to find it distally in some of the hemithoracis.[4-7] Small mediastinal cysts, including also the thymic are without any clinical manifestations, and very often they don't need any therapeutic treatment.[4-6]

The bigger cysts in the mediastinum, with compressed structures around, give different clinical manifestations, and need therapeutic treatment like puncture or extirpation of the cyst.[3]

In this paper we present giant mediastinal cyst, which originated from the thymus gland and which starts from the upper and anterior mediastinum, but goes down to both pleural spaces, especially the right one, where the cyst filled the distal third of the right chest cavity. The cyst was full with clear transparent fluid of more than 2.5 liters, and with this volume it compressed the surrounding structures, heart and lungs, especially the right lung which was partially collapsed.

Also, to this day there has not been a consensus about the surgical therapeutic approach for the treatment of mediastinal cysts, puncture, sternotomy or thoracotomy[3]. The puncture of a bigger cyst can release symptoms, but the persistence of the epithelium that produces fluids can fulfill the cyst again. Also there is a possibility of infection of the cyst and serious problems with infection of mediastinum.

CASE REPORT

A 52 years old woman, without any clinical symptoms, on accidental chest X-ray screening was refereed with a big shadow in the distal third of the right chest (Figure 1). She is an administrative worker, without any physical activity, so maybe this is the reason that she has no clinical symptoms.

After the first X-ray of the chest a CT of the chest with intravenous contrast was made, where a big amount of liquid in the right pleural spaces with maximal dimension of 180x146x115 mm was found, that spread in the anterior and superior of the heart in the mediastinum, and which on the first sight looked like pleural effusion. But, with a bigger magnification a small gap between the fluid and the thoracic wall was found, especially

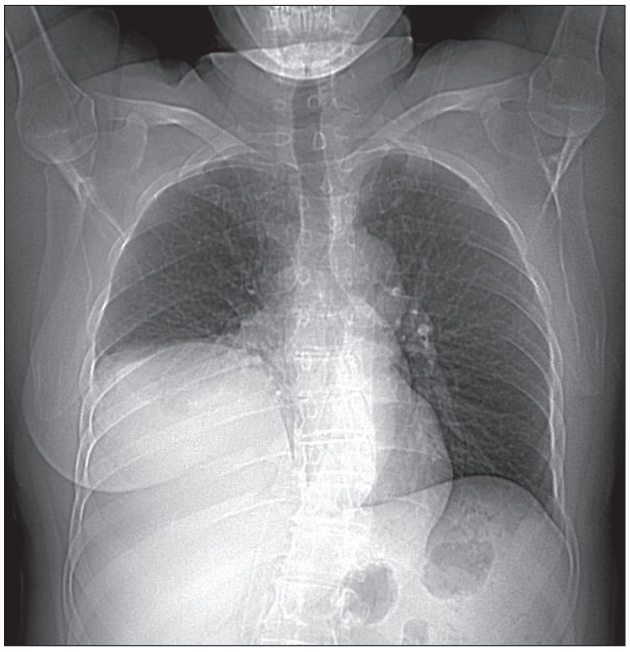

Figure 1. Preoperative chest X ray

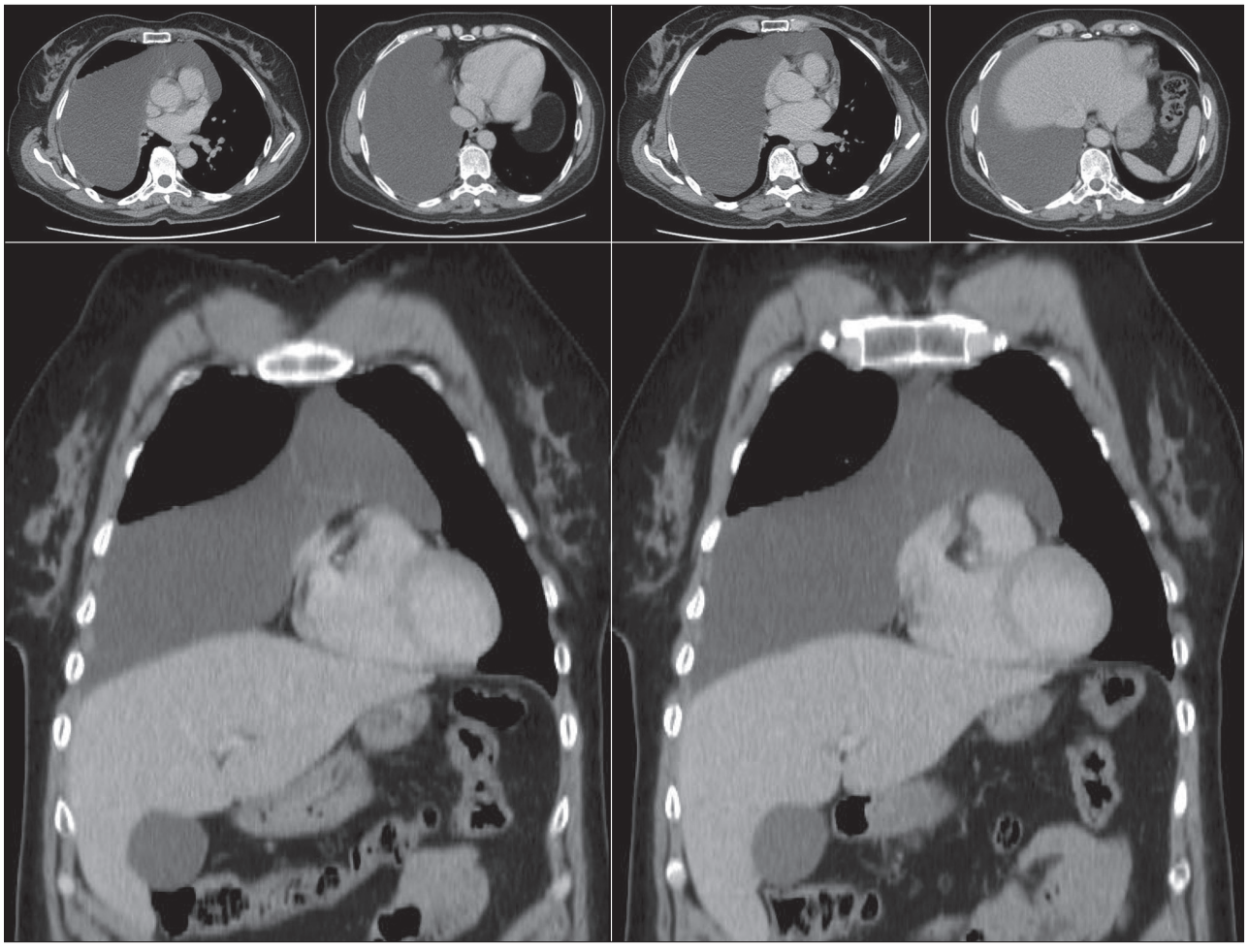

Figure 2. Preoperative CT scans of thorax

in the rear parts, so we can conclude that the fluid was closed in big cyst with very thin wall. That was a big cyst which started from the mediastinal part of the thorax and down to both hemi thoraces (both pleural spaces), especially in the right hemi thorax where they filled the distal third of the hemi thorax, and pushed the right lung that was partially collapsed (Figure 2).

After we have prepared the patient, in general anesthesia surgically treatment was performed the small right anterior thoracotomy, in the right sub mammary grove (Figure 3). We selected this approach according to the awareness that the biggest part of the cyst was in the right hemi thorax, and the possibility of persistence of adhesions to the parietal and visceral pleura, that was not seen on CT, because we supposed that this cyst persisted for a long period which was the reason for the lack of symptoms. After opening the right hemi thorax we saw that this change was really a cyst (Figure 4), filled with clear transparent fluid, that was free in the right pleural space, with possibility to mobilize, but according to the enormous dimensions and the small thoracotomy, we opened the cist and aspirated the fluid. We aspirated 2.5 liters of fluid that we sent to for histological examination. After collapsing the bigger part of the cyst we mobilized the cyst and pulled out this part of the cyst. After that, we continued to mobilize the cyst from the pericardium, where it was adherent (picture 4). After that we opened the left pleural space and from this part we mobilized the left part of the cyst. Finally we finished with mobilization of the cyst up in the mediastinum to the left brachiocephalic vein (Figure 4), where we eclipsed the thymus veins and completely removed the whole pathologic sample. We put drains in both hemi thoraces and in the mediastinum, we checked the re-expansion of both lungs, especially the right one which was collapsed in the begging. After that we closed the wound. The post-surgery period was well and after 4 days the patient was discharged from hospital, with control X-ray of the chest which was well (Figure 5).

On the cytology examination of the fluid only benign cells, erythrocytes, lymphocytes, macrophages and mesothelium cells were found. On the pathohistological examination it was seen that this is giant thymic cyst (Figure 6). The cyst had the dimensions of 19x9x4 cm, with thickening of the wall 0.1 to 0.3 cm. The following was seen on microscope: the lining of the cyst is composed of epithelium which is flattened, cuboidal. Under the epithelium the cyst wall composed of connective

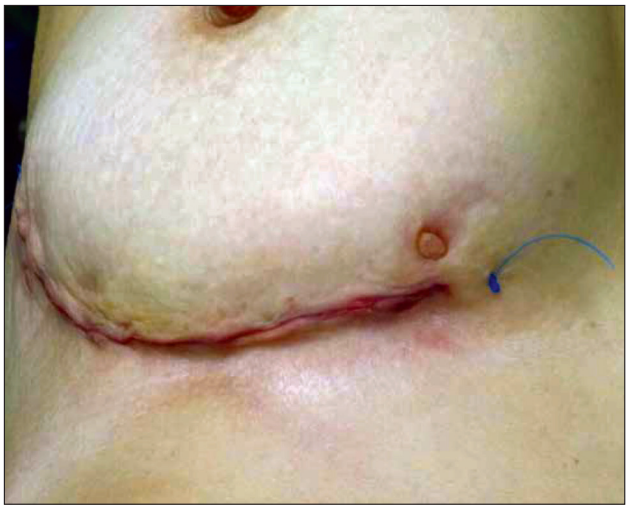

Figure 3. Operative scar (small anterior right thoracotomy)

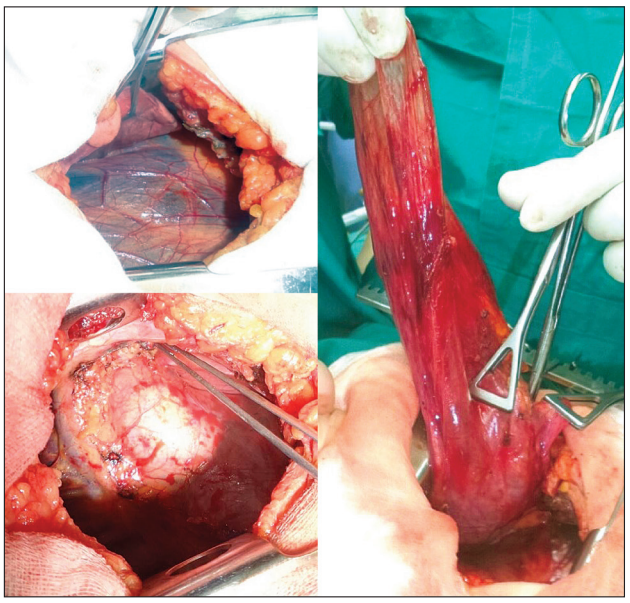

Figure 4. Intraoperative findings of mediastinal cyst

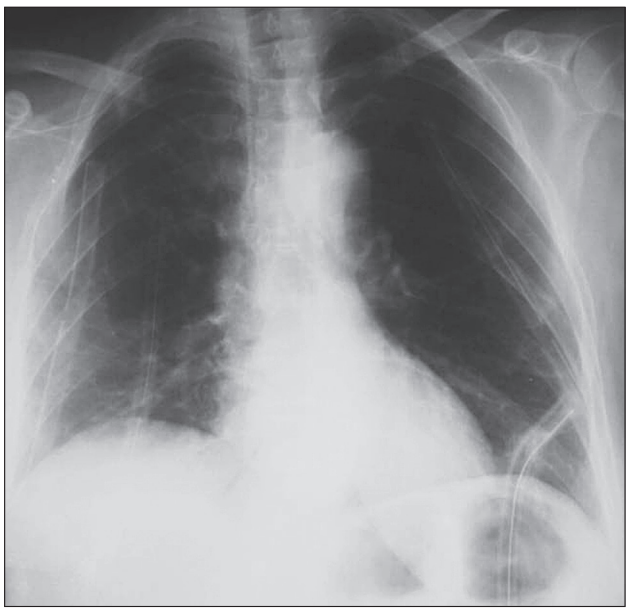

Figure 5. Control chest X ray

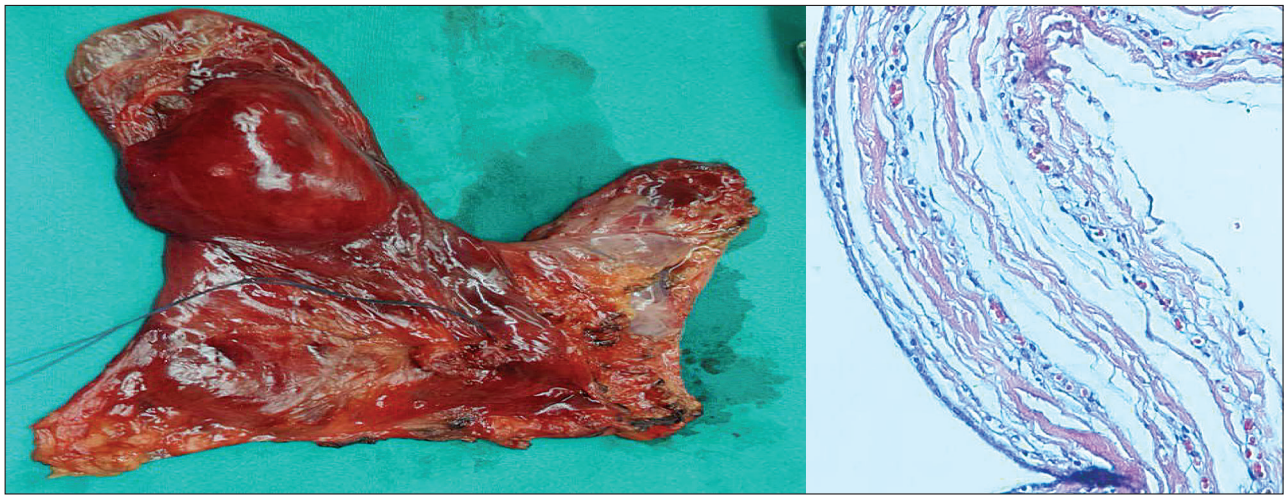

Figure 6. Extirpated mediastinal cyst (macroscopic and microscopy findings)

tissue with small capillary blood vessels. On the periphery there was also a graduate residual thymic tissue, composed of maturely lymphocytes in lymphoid follicles arranged central and somewhere paracentral, there were remnants of Hassall corpuscles and also dystrophic calcifications were present. Between these lymphoid tissues there were congested arterial and venous vessels filled with erythrocytes to be seen.

DISCUSSION

The thymus forms from the third pharyngeal pouches during the embryonic development and descends into the anterior–superior mediastinum. [3,5,6] The thymus is normally located in the anterior mediastinum, extending from the left brachiocephalic vein superiorly to the base of the great vessels inferiorly. It normally lies anterior to the ascending aorta, the pulmonary outflow tract, and the superior vena cava.[1-6] Knowing this fact it is possible to find the thymus or the thymus changes (neck, upper and anterior mediastinum, middle mediastinum or hemithoraces).[5] From the pathological changes of thymus very often we see a hyperplasia, rarely regressive thymus and more rarely thymoma which is associated with myasthenia gravis.[7] The cysts of the thymus gland are rarely detected, they are very often small and they don't need any intervention. The thymic cysts can be found in all places where it is possible to find the thymus gland: neck, anterior mediastinum, middle mediastinum, around the main bronchus and the hemithoraces.[2,4]

The thymic cysts are rare, only 2-3% of all mediastinal cyst.[8,9] The thymic cysts may be congenital or acquired. The congenital thymic cysts are typically unilocular and contain clear fluid within the thin wall. They are mostly asymptomatic and are found incidentally during the first two decades of life. On the contrary, the acquired thymic cysts (also known as multilocular thymic cysts) are usually multilocular and contain turbid fluid or gelatinous material as result of the haemorrhage or infection. The acquired thymic cysts are reported to be associated with radiation therapy for Hodgkin's disease, thymic tumor, thymic hyperplasia, thoracostomy or chest trauma, and human immunodeficiency virus (HIV) infection. [10-17]

The diagnosis is according to the CT examination on the localization of the cyst. On CT the thymic cyst can be manifested as oval shape, smooth contour, midline location without visible adjacent thymic tissue. Calcification, mass effect, or septa were the most frequent qualitative imaging features of intrathymic cyst.[4,9]

In the paper of Araki on CT attenuation of intrathymic cyst >20 HU in 83% (15/18) of the patients it was present in the cohort, with a mean attenuation of 38 HU on the contrast-enhanced CT and 45 HU on the unenhanced CT.[4] The CT attenuation was much higher than the "water attenuation" or "fluid attenuation", which were often used to describe the characteristic features of the thymic cyst, and was higher than the mean CT attenuation of 3 HU (ranging e20 to 17 HU) in three patients with multilocular thymic cysts in the study of Choi et al.[9,10]

The definitive diagnosis was made with histological analysis, where a thin wall composed of connective tissue and caver inside with cuboids epithelial cells were seen. In the surrounding tissue a lymphoid tissue and Hasselss bodies can be

seen. In the paper of Araki, histologically, seven cases were subcategorized as thymic cysts, and 11 cases were categorized as bronchogenic cysts, based on the presence of cilia along the epithelial lining of the cyst.[4] The imaging findings were not significantly different between the two histopathological subgroups, which was expected, given that the difference at histopathology is very subtle between the two subtypes. No differences were observed in the imaging findings of the unilocular versus multilocular cysts, probably due to the limited number of multilocular cysts in this cohort.[4]

From clinical point of view, the benign thymic cysts are usually asymptomatic and are of little clinical importance being classified as an intra-thoracic mesothelial cyst, as congenital abnormality. But if the cyst becomes larger, the main clinical symptoms that can appear are from the compression of surrounding structures, like heart, great vessels and lungs; so arrhythmias, venous standstill, respiratory symptoms like dyspnea, irritant caught and rarely dysphagia, if the cyst is located posterior, can appear. In rare cases chest pain, orthopnea, wheeze, fever and dysphonia can be present.[2]

About the therapeutic approach there is no consensus, except for waiting and observing, puncture or surgical treatment. There is no consensus when to treat surgically or to approach surgically to the lesion (sternotomy, thoracotomy, VATS).[2] For small cysts we can wait and watch or puncture if it is available with the ultrasonography or computer tomography. For some of the small cysts and for the large cysts surgical treatment is indicated, for two reasons – possibility to mimic other pathological changes of thymus-melanoma, and also the possibility to recidivate the cist, and to fill again and again after puncture, since the epithelium of the cyst was not removed.

The cysts in the mediastinum, including the cyst of the thymus, are very often benign, so very often a minimal invasive approach as VATS or small thoracotomies were chosen.

The percutaneous drainage may be appropriate for mildly symptomatic cysts or individuals not suitable for surgery. But, there is the risk of recurrence, which was significant. Also, there is a possibility of infection of the cyst and having bigger problems than in the beginning.[2]

Because the biggest part of the cyst was in the right hemithorax, there is possibility of persistence of adhesions to parietal and visceral pleura; we selected the small right anterior thoracotomy. With this thoracotomy we could remove the part that was in the right hemithorax, but also the part in mediastinum under the sternum, and also with some difficulties the part in the left hemithorax. We were prepared to expand the surgical approach to the left side with the left anterior thoracotomy or sternotomy if it was necessary. Also, we considered the midsternotomy approach, because it was a mediastinal cyst, but in the end we decided for small anterior right thoracotomy, because the main part of the cyst was in the right hemithorax and there was a possibility for persistence of adhesions to pleura.

For smaller mediastinal cysts maybe a video assisted surgical approach will be appropriate as minimally invasive. With this approach the whole pathologic substrate with minimally invasive surgery can be removed.

Surgical excision, via median sternotomy, thoracotomy or video-assisted techniques is necessary for definitive diagnosis, treatment and elimination of recurrence. The recurrence of the thymus cyst, if completely removed, was not referred in the literature.[2]

In conclusion, we can say that for large benign thymic cysts with exerting compressive effects, it is recommended to be surgically removed, guaranteeing the definitive diagnosis and the preventing recurrence.

Conflict of interest:
We do not have conflict of interest to declare.

REFERENCES

1. Lyndon Luk, Pierre D. Maldjian, Abhishek Kumar, Stephen Peters -Thymic cyst arising in the middle mediastinum posterior to the left atrium—a peculiar location Clinical Imaging 36 (2012) 837–839
2. Jennings S, et al. Successful Giant Thymic Cyst Removal: Case report and review of the literature. Heart, Lung and Circulation (2015),http://dx.doi.org/10.1016/j.hlc.2015.02.013
3. Nasseri F, Eftekhari F. Clinical and radiologic review of the normal and abnormal thymus: pearls and pitfalls. Radiographics 2010;30:413–28.
4. T. Araki et al. Intrathymic cyst: Clinical and radiological features in surgically resected cases, Clinical Radiology (2014), http://dx.doi.org/10.1016/j.crad.2014.03.002

5. Zielijnski M, Kuzdzal J, Szlubowski A, Soja J. Transcervical–subxiphoid–videothoracoscopic “maximal” thymectomy—operative technique and early results. Ann Thorac Surg 2004;78:404–10.
6. Nishino M, Ashiku SK, Kocher ON, et al. The thymus: a comprehensive review. RadioGraphics 2006;26:335e48.
7. KOndov G., Trajkovska T., Ljapcev R., Gogova L., Kondova I. Thymectomy in Myasthenia gravis: Responese and complications. Turkish Respirat J 2005;6:1.
8. Brown L, Muhm J, Sheedy 2nd P, et al. The value of computed tomography in myasthenia gravis. AJR Am J Roentgenol 1983;140:31e5.
9. Choi YW, McAdams HP, Jeon SC, et al. Idiopathic multilocular thymic cyst: CT features with clinical and histopathologic correlation. AJR Am J Roentgenol 2001;177:881e5.
10. Jeung M-Y, Gasser B, Gangi A, et al. imaging of cystic masses of the mediastinum. RadioGraphics 2002;22(Suppl. 1):S79e93.
11. Suster S, Rosai J. Multilocular thymic cyst: an acquired reactive process:study of 18 cases. Am J Surg Pathol 1991;15:388e98.
12. Baron RL, Sagel SS, Baglan RJ. Thymic cysts following radiation therapy for Hodgkin disease. Radiology 1981;141:593e7.
13. Lindfors K, Meyer J, Dedrick C, et al. Thymic cysts in mediastinal Hodgkin disease. Radiology 1985;156:37e41.
14. Nakamura S, Tateyama H, Taniguchi T, et al. Multilocular thymic cyst associated with thymoma: a clinicopathologic study of 20 cases with an emphasis on the pathogenesis of cyst formation. Am J Surg Pathol 2012;36:1857e64.
15. Izumi H, Nobukawa B, Takahashi K, et al. Multilocular thymic cyst associated with follicular hyperplasia: clinicopathologic study of 4 resected cases. Hum Pathol 2005;36:841e4.
16. Jaramillo D, Perez-Atayde A, Griscom N. Apparent association between thymic cysts and prior thoracotomy. Radiology 1989;172:207e9.
17. Avila NA, Mueller BU, Carrasquillo JA, et al. Multilocular thymic cysts: imaging features in children with human immunodeficiency virus infection. Radiology 1996;201:130e4.

ГИГАНТСКА МЕДИЈАСТИНАЛНА ТИМИЧНА ЦИСТА – ПРИКАЗ НА СЛУЧАЈ

Горан Кондов[1], Борислав Кондов[1], Марија Јовановски Срцева[2], Гоге Дамјановски[3], Имран Ферати[4], Иван Карапетров[4], Ирена Кондова Топузовска[5], Николина Тановска[6], Анита Кокарева[2]

[1] Универзитетска клиника за Торакална и Васкуларна Хирургија, Медицински факултет Скопје

[2] Универзитетска клиника за анестезија, реанимација и интензивно лекување, Медицински факултет Скопје

[3] ПЗУ Мегамед - Скопје

[4] Клиничка болница Тетово

[5] Универзитетска клиника за инфективни болести и фебрилни состојби, Медицински факултет Скопје

[6] Универзитетска клиника за неврологија, Медицински факултет Скопје

Резиме

Авторите презентираат редок случај на гигантска медиастинална циста која потекнува од тимичната жлезда, која иде надолу во двете плеврални празнини, особено во десниот дел од градниот кош каде што е сместен доминантниот дел од цистата. Цистата беше исполнета со 2,5 литра безбојна течност и ги компримираше околните структури, како срцето, обата белодробни крила, особено десното кое беше делумно колабирано.

Пациентката со медиастинална циста, жена на 52 години, беше без било какви симптоми, беше случајно откриенана случајно направена Ртг графија на бели дробови, каде се гледа засенченост на дисталната третина на десниот хемиторакс.

Случајот беше комплетно документиран со ЦТ на граден кош, по што се постави индикација за хируршки третман. Хируршката интервенција беше успешно изведена во општа анестезија, преку мала десна предна торакотомија, преку која се мобилизира најголемиот дел од цистата кој беше сместен во десната плеврална празнина, но по тоа се отстрани цистата во целост со отстранување на цистата од предниот и горен медиастинум заедно со тимичното ткаење од кое потекнуваше, за на крај да се отстрани и делот од цистата кој беше во левата плеврална празнина.

Клучни зборови: медиастинална циста, тимична циста, хируршки третман