ORIGINAL RESEARCH PAPER

Pathology

A RARE CASE OF AN ANTERIOR MEDIASTINAL MASS; CHOLESTEROL GRANULOMA OF THYMUS

KEY WORDS:

Dr. Litty Treesa Sebastian Assistant Professor, Department Of Pathology Palakkad Institute Of Medical Sciences, Opp Deer Park, Walayar, Palakkad, 678624

Dr. Geetha C. G Assistant Professor, Department Of Pathology Amala Institute Of Medical Sciences, Amalanagar, Thrissur, 680555

Dr. Joy Augustine Professor And HOD (Retired) , Department Of Pathology Amala Institute Of Medical Sciences, Amalanagar, Thrissur, 680555

ABSTRACT

Mediastinal cholesterol granulomas are extremely rare entities constituting about 1% of all mediastinal masses.[2] These, mostly mimic thymic neoplasms or appear to be an enlarged lymph node. Histopathological examination is often confirmatory. Here, we present a rare case of a 50-year-old patient who was found to have a mediastinal mass while ongoing aortic valve replacement. The mass was excised and on histopathological examination turned out to be a cholesterol granuloma in thymus.

INTRODUCTION

Mediastinal masses comprise a wide range of pathological entities. While neurogenic tumours, foregut cysts and germ cell neoplasms are commonly seen in children, primary thymic neoplasms, lymphomas and thyroid masses are seen more among adults. Though rare the possibility of a cholesterol granuloma of thymus also needs to be considered. Here we present a rare case of a 50-year-old man who was incidentally detected to have an anterior mediastinal mass which turned out to be a cholesterol granuloma of thymus.

Case Presentation

The patient is a 50-year-old man was taken up for Aortic Valve Replacement. Intraoperative findings showed dilated aorta along with calcified aortic valve leaflets. A swelling of 1x2 cm, which was probably thought to be a lymph node was seen in anterior mediastinum near thymus. Thymectomy and mediastinal node dissection was done.

The specimen submitted for histopathology comprised of two fibrofatty tissue fragments each measuring 9X 2.5X 2 cm. Cut section of both showed multiple nodules with tiny yellowish spots largest measuring 2.5X2X2 cm.

Microscopy showed atrophied thymic tissue with multiple bunched cholesterol spaces. Interstitial adipose tissue showed numerous hemosiderin laden macrophages. Foci of ossification and calcification were also seen.

On the basis of these findings the diagnosis of cholesterol granuloma was made. The patient was discharged after post operative care and is under follow up. He is doing well at present.

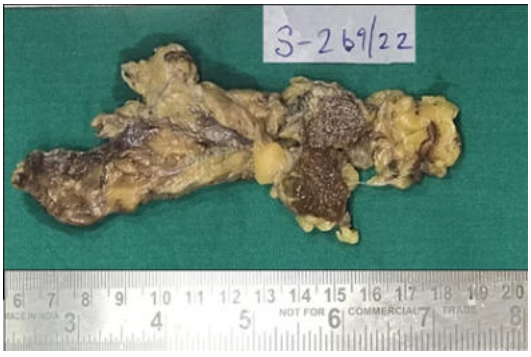

Figure 1. Gross image of the mediastinal mass: There was 2 nodules each average measuring 9X 2.5X 2 cm. The cut surface showed nodules with yellowish spots.

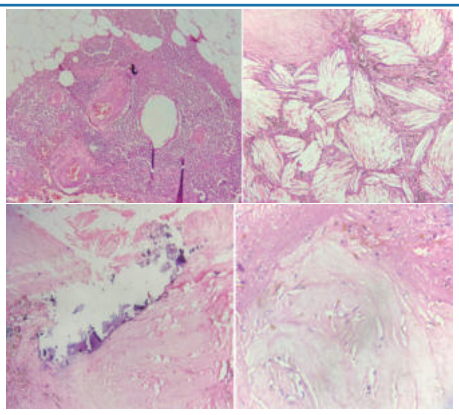

Figure 2: Microscopy of the nodules revealed thymic tissue (A)along with multiple bunched cholesterol spaces and many hemosiderin laden macrophages(B). Foci of calcification (C) and ossification (D) were also seen.

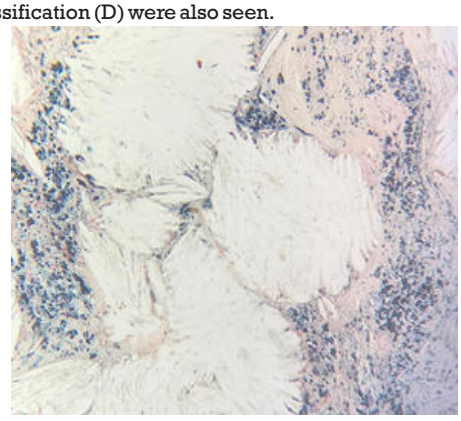

Figure 3: Perls stain highlighting hemosiderin laden macrophages

DISCUSSION

Cholesterol granulomas occur as part of tissue response to presence of cholesterol crystals.[10] Crystallisation of cholesterol occurs as part of local trauma to tissues and due to the resultant cell membrane lysis and haemolysis. At the tissue level cholesterol acts as a tissue irritant and the foreign body reaction includes hemosiderin laden macrophages and associated giant cell response. The term cholesterol granuloma, first described by Manasse et al. [1] comprises granulation tissue formation on a background of histiocytes, hemosiderin, and cholesterol clefts that are seen

extracellularly or as engulfed within multi-nucleated giant cells.

Cholesterol granuloma of temporal bone has been frequently described and is commonly seen associated with inflammatory ear diseases. Other less common sites include organs like liver, spleen, thyroid, parotid glands, kidney, testes along with breast, peritoneum and mediastinum.

Mediastinal cholesterol granuloma is rare with only 13 previously documented cases.[4-9] Of this 10 were male and 3 female with a median age of 52.1 years. All cases were asymptomatic with largest documented size being a posterior mediastinal mass measuring4.5 x 7 cm^4producing no pressure symptoms. Majority were incidental findings with other interventions or were excised in view of suspicion of malignancy or a lymph node pathology.

Preoperative diagnosis using imaging techniques like CT, PET CT is challenging due to close resemblance with other mediastinal tumours. MRI is the preferred investigation with T1 and T2 weighted scans showing high signal intensity due to peripheral methaemoglobin accumulation.

The differential diagnosis includes thymoma other epithelial malignancies, lymphomas, mesenchymal or neural neoplasms. Reactive and infectious conditions also can occur. Cystic teratoma or a multilocular thymic cyst could be considered in presence of prominent cystic component.

Exact pathogenesis of formation of cholesterol granuloma is unclear. The association with elevated serum cholesterol levels has been proposed by some. Thymic cholesterol granuloma could represent remnants of a benign cystic tumour of thymic origin which underwent degenerative changes, rupture of cyst and consequent inflammatory response leading to formation of cholesterol cleft granulomata.[3] Over time the cyst disappears and only the tissue response was seen behind. Another fairly accepted mechanism is that of cholesterol crystal formation subsequent to cell degeneration which could be either post trauma or post inflammatory.[2] So it is advisable to do complete surgical resection even after diagnostic trucut biopsy.[3]

Study of previously described cases shows an association between mediastinal cholesterol granuloma, dyslipidaemia and cardiovascular diseases. Majority had cardiac problems like stenosis, cardiac aneurysm or other congenital vascular anomalies. Our patient also had multiple cardiovascular diseases but a background of dyslipidemia was lacking. Definite proof of this association requires further study.

CONCLUSION

Mediastinal cholesterol granulomas are rare incidentally detected benign entities and are mostly asymptomatic. Association with dyslipidemia is seen in many documented cases. Cardiovascular problems and vessel wall abnormalities either acquired or hereditary are also seen. Pathogenetic mechanism behind remain uncertain. Proposed mechanisms include local haemorrhage, chronic inflammation, as part of degeneration of benign neoplasms and elevated serum cholesterol. MRI may be helpful, but complete surgical excision is preferred for diagnostic accuracy.

Conflict of Interest

No conflict of interest.

REFERENCES

1. Manasse P. Ueber granulationsgeshwulst mit fremdkoer-riesenzellen. Virchows Arch. 1894;136:245. doi: 10.1007/BF01928875.
2. Manabe T, Oka S, Ono K. Multifocal cholesterol granulomas of the anterior mediastinum. Surgical Case Reports. 2020 Dec;6(1):1-5.
3. Weissferdt A, Kalhor N, Moran C. Primary thymic cholesteroloma: a clinicopathological correlation of four cases of an unusual benign lesion. Virchows Archiv. 2015 Nov;467(5):609-11.
4. Shindo K, Kato M. A case of mediastinal cholesterol granuloma. Japanese Journal of Respiratory Surgery. 2008 Jan 15;22(1):101-5.
5. Luckraz H, Coulston J, Azzu A. Cholesterol granuloma of the superior mediastinum. The Annals of thoracic surgery. 2006 Apr 1;81(4):1509-10.
6. Fujimoto K, Takamori S, Yano H, Sadohara J, Matsuo T, Terazaki Y, Ishibashi M, Hayabuchi N. Focal cholesterol granuloma in the anterior mediastinum: [18F]-fluoro-2-deoxy-D-glucose-positron emission tomography and magnetic resonance imaging findings. Journal of Thoracic Oncology. 2007 Nov 1;2(11):1054-6.
7. Ezzat TF, Alowami S. Cholesterol granuloma of the anterior mediastinum with osseous metaplasia. Rare Tumors. 2012 Nov 13;4(4):150-2.
8. Krishnan TR, Sinha SK, Kejriwal NK. A rare case of cholesterol granuloma in the anterior mediastinum. Heart, Lung and Circulation. 2013 Apr 1;22(4):303-4.
9. Ghigna MR, Dorfmuller P, Fadel É, Thomas de Montpréville V. Cholesteroloma: a rare thymic pseudotumor. Pathology International. 2016 Mar 29;66(6):356-7.