

# Calcified Mediastinal Lesions: A Rare and Unusual Coincidence

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## Abstract

Calcification in thyroid and thymic tumors are very rare. Here we present two cases reported to the outpatient department within a span of one week. Both of them had radiological evidence of mediastinal tumor with ring calcification in the outer border. One was diagnosed as retrosternal thyroid with calcification by surgical biopsy. The other case was a superior mediastinal tumour with ring calcification and a diagnosis of thymic lesion was made based on the clinical evidence of myasthenia gravis in the patient.

**Keywords:** Ring calcification, thymic cyst, retrosternal thyroid

## Introduction

Calcification in mediastinal lesions are not uncommon. Mediastinal diseases presenting with calcification are mediastinal teratoma, hamartoma, dermoid cyst, lymph node masses and aortic aneurysm. Retrosternal thyroid and thymic lesions rarely develop calcification. There are three patterns of calcification in thyroid lesions. Eggshell calcification is one of the patterns seen in benign thyroid lesions. Others are dystrophic calcification, and fine stippled psammomatous calcification.<sup>[1]</sup> Eggshell calcification seen in benign thyroid lesion is very rare. It is suggested that intra-lesional haemorrhage causes calcification in thyroid tumour.

Thymic lesions presenting with calcification are benign thymoma and thymic cysts. Benign thymic cysts are uncommon lesions that account for approximately 3% of all anterior mediastinal masses. Frequently, they are asymptomatic and the actual identification of the tumor is usually made after surgery and histological examination. Rarely thymic cysts develop calcification in its outer wall. Apart from thymic cyst, benign thymomas undergo necrosis and calcification in due

course.

Here we report two cases of mediastinal masses with eggshell (ring) calcification, because of the rarity and coincidence.

## Case-1

A 59-year-old female patient was investigated for non-productive cough associated with dyspnea and swelling in front of the neck. Clinical examination revealed palpable thyroid swelling with retrosternal extension. Chest roentgenogram demonstrated a mass to the left of the midline in the root of the neck extending to upper mediastinum (Figure 1A). Computed tomography (CT) scan demonstrated a mass surrounded by calcification downside of the left lobe of the thyroid gland with extension to the upper mediastinum (Figure 1B, 2A, 2B). The mass was 33 × 25 × 45 mm in size. She was taken to surgery for thyroid exploration. The operative findings were that the left lobe of the thyroid gland was extending to the superior mediastinum and with calcification of the outer border in a horse shoe shape. The right lobe was normal. Left lo-

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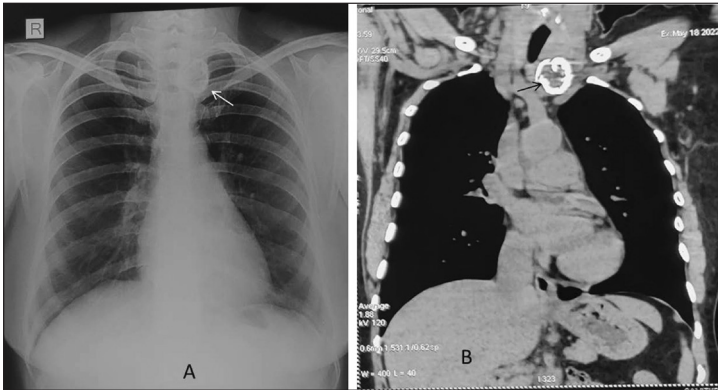


Figure 1(A): X-Ray Chest PA view showing a round lesion with calcification in the root of neck (White arrow). Figure 1(B): CT Thorax coronal view showing the ring calcification in the superior mediastinum (Black arrow)

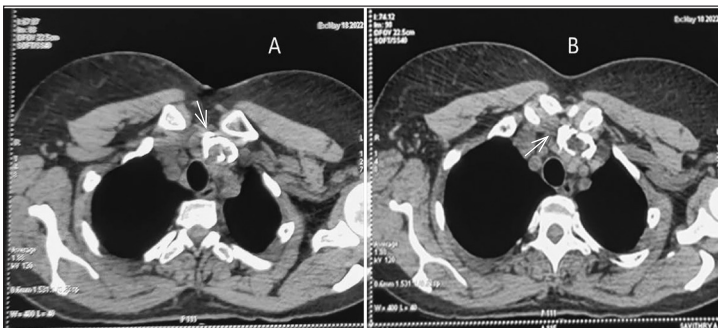


Figure 2 (A,B): CT thorax mediastinal window showing the mass in the superior mediastinum with horse shoe shaped calcification of the outer border (White arrow).

bectomy was successfully performed with sternotomy. On gross examination, the cut surface of resected lobe revealed necrosis, haemorrhage and calcification. The pathological examination revealed eggshell calcification of the thyroid gland with old massive intra-thyroidal bleeding.

### Case-2

This is a case of myasthenia gravis secondary to thymic cyst in a 64-year-old male. This patient with no



Figure 3(A): PA view showing a spherical shadow with rim calcification (Black arrows). Figure 3(B): Left lateral view showing the lesion in the anterior mediastinum (White arrow).

known comorbidities presented with complaints of fluctuating ptosis, intermittent fatigable diplopia and difficulty in swallowing of one month duration. Clinically, the patient had features of oculo-pharyngeal myasthenia and the diagnosis was confirmed by neostigmine test and acetyl choline receptor antibody. X-Ray chest PA view and lateral view showed a rounded opacity with calcified borders in the superior mediastinum (Figure 3A, Figure 3B). CECT chest revealed 5 cm × 3 cm cystic lesion occupying the anterior mediastinum predominantly on the left side with peripheral rim of calcification (Figure 4A, Figure 4B). On the background of proven myasthenia gravis on treatment, this mediastinal mass by all means will be a thymic lesion. Surgical excision and histopathological examination was offered to the patient. But he was not willing for a major surgical procedure. Patient was advised to continue oral steroids and immunosuppressants, which he was already on.

### Discussion

Eggshell calcification of thyroid is rare and only three cases have been reported. One was an ultrasonic appearance of an eggshell calcification of a thyroid nodule reported in 1978 by Gooding GA,<sup>[2]</sup> the second was eggshell calcification in follicular thyroid carcinoma reported in 2005 by Cheng SP *et al.*<sup>[3]</sup> The last and recent one was double eggshell calcification in thyroid in 2007 by Vandemergel.<sup>[4]</sup>

Egg-shell calcification is one of the patterns of dystrophic calcifications and is often associated with multinodular goiters.<sup>[5]</sup> It was generally thought to be an indicator of benignancy,<sup>[5]</sup> however, cases of papillary carcinoma<sup>[6]</sup> and undifferentiated carcinoma<sup>[7]</sup> associated with this type of calcification have been reported. In Taki S *et al* series, 43% (6/14) of this type of calcification was associated with cancer, and all of them were papillary carcinoma.<sup>[8]</sup>

Typical benign nodules are well defined, mostly

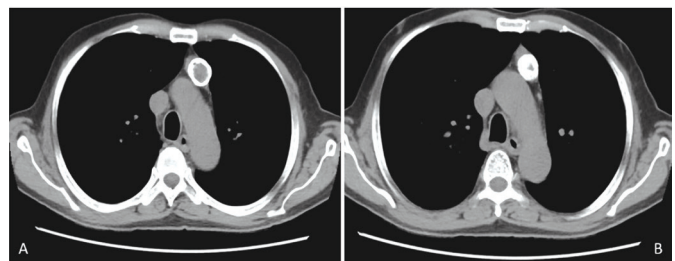


Figure 4: CT Thorax-Mediastinal window showing (A) cystic shadow with calcified curvilinear border in the anterior mediastinum and (B) dense calcified lesion in the anterior mediastinum with central necrosis.

cystic, and hyperechoic relative to adjacent parenchyma (96% benign). These nodules have eggshell calcification and a thin, echolucent halo around the entire lesion, and they always contain internal debris. Lesions demonstrating eggshell calcification and a thin echolucent halo around the entire lesion are most often benign. Some authors have found that the halo sign is present in 21%–33% of thyroid cancers. But Cheng SP considered that this type of thyroid calcification is not a good indicator of benignancy.<sup>[3]</sup>

This case is unusual in that eggshell calcification of thyroid was located in the retrosternal area (superior mediastinum), a finding which is not usually observed. Ring-shaped calcifications may simulate the eggshell appearance. These include aneurysms of the great vessels, parathyroid tumors, pulmonary arteries in pulmonary arterial hypertension, thymic cysts, and thyroid tumors.<sup>[6]</sup>

Thymomas are the most common type of anterior mediastinal tumors. Calcification is sometimes observed in thymomas using computed tomography (CT), and it is more frequent in invasive thymomas than in non-invasive thymomas. However, the significance of calcification in thymomas remains unknown. Calcification is most commonly observed in type B thymomas and type C thymic carcinoma. Thymic cysts are uncommon lesions of the anterior mediastinum, accounting for 1%–5% of anterior mediastinal masses. They may be unilocular or multilocular, and may be congenital or acquired. Thymic cysts are associated with myasthenia gravis, but, are less common with multilocular thymic cysts. Radiographically, a thymic cyst usually appears as a well-defined, cystic mass with an imperceptible wall. The CT attenuation values are typically consistent with fluid; however, the appearance may vary if haemorrhage or infection complicates the cyst. Curvilinear calcification of the cyst wall occurs in few cases.

Myasthenia Gravis' (MG) association with thymic cyst is rare. There have been very few cases reported in literature.<sup>[9]</sup> MG is usually associated with unilocular thymic cyst and it is extremely rare in multilocular cysts.<sup>[9]</sup> Thymectomy has been the proven therapy for patients with myasthenia gravis.<sup>[10]</sup> Since thymic cyst has an association with thymoma,<sup>[11]</sup> all patients with MG should be offered thymectomy after initial treatment and stabilization. It is also reported that MG rarely may recur after thymectomy.<sup>[12]</sup>

Such cysts can either be congenital or acquired in origin. Congenital cysts are typically unilocular. They contain clear fluid and have walls that are thin to the

point of translucency. They show no evidence of inflammation on careful histopathological examination.<sup>[10]</sup> By contrast, acquired thymic cysts result from an inflammatory process. They are usually multilocular, hence the commonly used term 'multilocular thymic cyst.' The cysts, which contain turbid fluid or gelatinous material, have thick and fibrous walls. Typically, they show evidence of significant inflammation and fibrosis on histopathological examination.

## Conclusion

Rim calcification in two different mediastinal tumours was reported here for its rarity and sequential presentation in the outpatient department.

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