Retrosternal goiter located in the mediastinum: surgical approach and operative difficulties

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Abstract

Most retrosternal goiters are situated in the anterior mediastinal compartment, but according to the literature, 10–15% are located in the posterior mediastinum. Although most of the anterior mediastinal goiters can be removed by a transcervical approach, posterior mediastinal goiters may require additional extracervical incisions. We report the case of a huge retrosternal goiter extending from the neck retrotracheally beyond the aortic arch and azygos vein with crossover from the left to the right side and ending at the level of the lower part of the left cardiac atrium, nearly reaching the diaphragm. Surgical removal is the treatment of choice in such cases. We performed an operation using a transcervical and right thoracotomy approach. Histopathological examination confirmed the diagnosis of the large goiter. The patient recovered well and was discharged in 1 week.

Keywords: Retrosternal goiter • Transcervical • Thoracotomy

INTRODUCTION

Most retrosternal goiters are situated in the anterior mediastinal compartment. Posterior mediastinal goiters are uncommon, comprising 10–15% of all mediastinal goiters. Although most of the anterior mediastinal goiters can be removed by a transcervical approach, posterior mediastinal goiters may require additional extracervical incisions. The literature has been reviewed to clarify the management of retrosternal goiters with regard to the various approaches, indications for extracervical incisions and their possible complications. In conclusion, while most retrosternal goiters can be resected through a transcervical approach, those extending beyond the aortic arch into the posterior mediastinum are better dealt with by either sternotomy or lateral thoracotomy. However, the overall number of complications associated with this approach is higher than that seen with the transcervical approach [1–5]. This report describes the use of transcervical and lateral thoracotomy with a good postoperative result.

CASE PRESENTATION

A 53-year old woman was referred to our institution with a 1-year history of a retrosternal goiter. The retrosternal goiter was first recognized when further routine diagnostics were initiated due to a non-specific chest discomfort. The patient had reported fatigue and dyspnöea during physical stress, and had noticed a large mass on the front of the neck 1 year before the admission to our hospital.

A chest X-ray was done in February of 2011, and showed a huge mass in the mediastinum, which compressed and dislocated the trachea. The ultrasound showed a large goiter: the right thyroid lobe with normoechogenic and hypoechogenic nodulus was measured at 45 × 32 × 70 mm and extended beyond the sternum and the left thyroid lobe, with similar nodulus, which was measured at 30 × 35 × 70 mm and extended beyond the sternum. The isthmus of the thyroid gland contained a nodulus, which was measured at 32 × 38 mm. The proper evaluation of the size of the goiter was impossible because of retrosternal localization.

The blood examination showed a slightly elevated level of the thyroid gland hormone FT3-4.5 pg/ml (1.5–4.1), a normal level of FT4-1.0 ng/dl (0.89–1.76) and a decreased level of thyroid-stimulating hormone –0.123 µl U/ml (0.400–4.000).

Because of the diagnosed toxicity of the thyroid gland, the patient received J131 at a dose of 830 MBq on 5 April 2011. The next ultrasound showed that there were no changes in the size of the thyroid gland.

A computed tomography (CT) scan showed the proper size of the thyroid gland, which extended from the neck retrotracheally beyond the aortic arch and azygos vein with crossover from the left to the right side and ended at the level of the lower part of the left cardiac atrium, nearly reaching the diaphragm. The goiter considerably compressed the trachea in the mediastinum and displaced it to the right side (Fig. 1A and B). The width of goiter in the mediastinum was 104 mm, length 170 mm and thickness 60 mm. Because we were not sure if the mass on the neck was the same as the mass in the mediastinum, we did a single-photon emission computed tomography (SPECT)/CT scan using J131, which showed that the big mass on the neck and in the mediastinum corresponded to the huge thyroid gland. The J131 was accumulating irregularly in the thyroid gland (Fig. 1C).
The patient was admitted to the Wroclaw Thoracic Surgery Centre. To prevent the risk of any future illnesses or death resulting from acute airway obstruction, the patient was qualified and prepared for an operation. We performed it using a transcervical and right thoracotomy approach.

First, we made a Kocher’s incision on the neck. We excised the subtotal right lobe of the thyroid gland and the big, nodose isthmus. Then we excised the cervical part of the big left gland lobe. Superior and inferior thyroid arteries and veins were ligatured. During the operation, we had some problems with separating the lower thyroid artery, because of the huge mass of the thyroid gland. Separation of the lower thyroid artery was difficult as there was not enough space between the left lobe of the thyroid gland and the sternum and the left lobe crossover from the left side of the neck to the right side of mediastinum. Therefore, we slightly elevated the sternum. This allowed the ligation of the inferior thyroid artery. Using the LigaSure vessel sealing system, we made a vessel occlusion and cut of the neck part from the mediastinum part of the left thyroid gland. This allowed us to temporarily leave the mediastinal part of the left lobe and avoid the bleeding. The incision on the neck was sutured. The patient was laid on the left side and a right lateral thoracotomy was made. The goiter (mediastinal part of the left thyroid gland) extended into the thorax beyond the aortic arch and azygous vein, from the left to the right side and ended at the level of the lower part of the left cardiac atrium nearly reaching the diaphragm. We resected the whole mass of the goiter situated in the mediastinum. We had some difficulties with preparing the goiter and separating the goiter from the mediastinum, oesophagus and azygos vein. There was lot of adhesion against the trachea, oesophagus and azygos vein. Preparation and isolation of this big lobe were difficult because of the location and the huge mass of the thyroid gland and the presence of big vessels adjacent to the goiter (superior vena cava, left and right brachiocephalic veins brachiocephalic trunk). During the preparation, we did not find any additional vessels feeding the goiter.

The length of the whole goiter was 26 cm (Fig. 2). There were no complications after the operation and the patient was discharged from hospital in 1 week. Pathological evaluation revealed
DISCUSSION

Long-standing huge goiters are common in iodine-deficient endemic areas. The majority of patients have symptomatic or clinicoradiological evidence of airway involvement. The incidence of dyspnoea, airway deformity and obstruction, intubation difficulty and tracheomalacia is high with huge goiters. The surgery is technically demanding, with greater associated chances of injury to native structures [3].

Machado et al. [1] noticed that most retrosternal goiters can be resected through a transcervical approach, but those extending beyond the aortic arch into the posterior mediastinum are better dealt with by sternotomy or lateral thoracotomy. Kilic et al. [2] recommend the use of transthoracic approaches, such as median sternotomy and thoracotomy for retrosternal goiter for surgical exposure, because they provide a wide exposure, facilitate removal of the mass and avoid catastrophic results, such as haemorrhage. We also recommend this operative procedure in such huge goiters situated in the mediastinum when tracheal compression is identified to prevent morbidity and mortality from acute airway obstruction.

Conflict of interest: none declared.

REFERENCES