Massive Goiter with Retrosternal Extension Encasing Trachea and Esophagus

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SUMMARY

Massive goiter with retrosternal extension may impose additional risk such as difficult intubation, tracheomalacia, and possibility of different incision and approach including sternotomy. We would like to report a case of massive goiter encasing major neck structures and how it was managed.

KEY WORDS:
Goiter, Retrosternal extension, Esophagus

CASE SUMMARY

A 30-year old Malay lady came to the outpatient clinic complained of anterior neck swelling. She started to notice the anterior neck swelling 18 years ago and it was progressively increasing in size. She denied having any obstructive symptom such as dysphagia and shortness of breath. She also denied of any underlying medical illness. On examination, the dimension of the neck swelling was 30 x 15cm. It extended from below the chin level until the suprasternal notch. The inferior margin was not palpable. Movement during swallowing was hardly appreciated. Clinically she was euthyroid.

The fine needle aspiration for cytology revealed a colloid goiter. Computed tomograph of the neck showed a heterogenously enlarged thyroid gland, involving both lobes and the isthmus. The mass extended inferiorly until the level of the arch of aorta. Posteriorly, the mass had reached the paravertebral region and met the opposite lobe of the gland. The trachea and esophagus were encased within the mass (Figure 1). Major vessels were pushed posterolaterally. The narrowest part of the trachea was 6 mm. Thyroid function test revealed hyperthyroid state. She was started on oral carbimazole 200 mg daily until the date of surgery.

Flexible intubation was done with the endotracheal tube size 6. Endoscopy showed the lumen of the trachea was compressed by an extraluminal structure. Neck was fully extended by the use of sandbag placed under the neck. A collar incision was made measuring 40cm along the skin crease. Subplatysmal skin flap was raised exposing the stretched strap muscle and sternocleidomastoid. After dividing the strap muscles, the multilobulated thyroid gland was exposed (Figure 2). Dissection was made to expose all the supplying arteries and veins. All of them were secured. Posteriorly, the internal jugular veins and carotid arteries were identified. Medial to carotid were the vertebrae. The nasogastric tube inserted preoperatively acted as a guide to isolate the esophagus. The inferior margin of the mass was made visible with the extension of the neck. As the attempt to remove the gland in toto carried a higher risk of injury to the adjacent structures, therefore the gland was divided in the midline. Harmonic scalpel was used for the division. Recurrent laryngeal nerves were preserved on both sides. After securing the bleeders, which was mainly from the superficial vessels on the gland and the gland substance itself, the whole mass was finally removed. It weighted 915 gram. The trachea was found to be collapsed and kinked. In view of high possibility of tracheomalacia, a tracheostomy was performed. The ventilator was weaned off on the next morning. Post-operative period was uneventful. She was kept on the tracheostomy tube for ten days and successfully decannulated. She was discharged home with thyroxine and calcium supplement.

DISCUSSION

Although multinodular goiter which is typically found in elderly women presenting as asymptomatic neck masses, it can also be seen in younger population[1]. Some of the patients may present with hypothyroidism, dysphagia and dyspneoa due to the tracheal and esophageal compression. Usually they will present to the outpatient department and treatment can be arranged in an elective manner. Besides fine needle aspiration for cytology, computed tomography scan is a useful imaging modality especially in a complicated massive goiter. Thyroidectomy procedures carry risk of complications including bleeding, recurrent laryngeal nerve injury, thyroid storm and hypocalcaemia. A massive cervico-mediastinal goiter always gives rise to additional challenges to the surgeon. These include difficult intubation, incision and approach to the tumour, tracheomalacia, possibility of sternotomy and problems with wound healing.

Using intraoperative nerve monitoring (IONM) is very helpful in such a complicated case. Apart from navigating through challenging anatomies, IONM may lend itself as a routine adjunct to the gold standard of visual nerve identification[2]. The recommended technique for substernal goiter extending from the neck to a level below the subcarinal region includes concomitant finger dissection and upward traction of the cervical thyroid through the subcapsular plane, with

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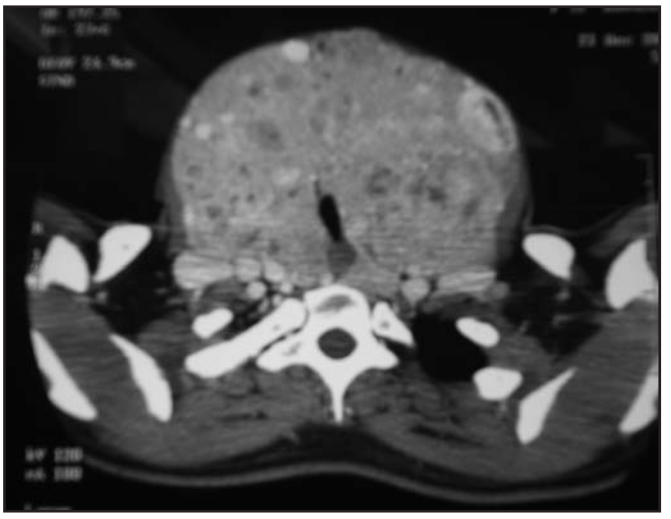

Fig. 1: CT scan showed thyroid mass encasing the trachea and esophagus.

Fig. 2: Inferior margin palpable with full extension of the neck.

obliteration of the post-resection substernal dead space by sutures[3]. Wang LS *et al* in 1994 reported 17 cases of substernal goiter in which all were operated through a low transverse collar incision.

Most mediastinal goiters are benign and can be removed through a cervical approach. Sternotomy should only be performed in cases of previous cervical thyroidectomy, invasive carcinoma, or ectopic goiter[4]. In our case, the lower margin of the thyroid gland was palpable after full neck extension and it was completely revealed after the dissection of the strap muscles were completed. Thus sternotomy was avoided.

Tracheostomy was inserted in this case in view of the collapsed trachea post tumour removal. Keeping the cuffed endotracheal tube for few days can lead to ventilator-acquired pneumonia, increase the risk of fail extubation due to tracheomalacic condition and tracheal stenosis. Elbashier Elbashier EM *et al* in 2008 reported 59 patients had tracheostomy out of 964 thyroidectomy patients, giving an incidence of 6%. In 25 of those 41 patients there was intra-operative tracheal deformity with narrowing (more than 50% of tracheal circumference on radiology) and gland adherence to the tracheal wall whereby the remaining 16 patients had tracheomalacia[5].

Managing a massive goiter imposed additional complications especially when surgery is concerned. Airway management, integrity of adjacent structures as well as anticipating the possible outcome should be considered as high priority. A teamwork approach including head and neck surgeon, cardiothoracic surgeon, anaesthetist, endocrinologist and chest physician are very important in order to provide the best outcome to the patient.

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