Thoracic Surgery Quiz – Case 11

A 68-year-old male was referred to our Department with a chief complaint of dysphagia. The physical examination was unremarkable. His medical history included left thyroid lobectomy, thoracic aortic aneurysm repair via median sternotomy and amiodarone administration for treatment of tachyarrhythmia. His laboratory findings were within normal range.

Contrast-enhanced coronal CT scan image demonstrated a globulous, sharply-demarcated lesion to the right of the trachea and oesophagus (fig. 1). The oesophagus appeared to be remarkably compressed by the mass, while the trachea was slightly displaced to the left (fig. 2).

A diagnosis of a diving thyroid gland was made and surgery was decided. The patient underwent total resection of the goiter through a cervical incision and a right posterolateral minimal thoracotomy (fig. 3). This operative strategy was chosen because of the anatomical alterations that previous surgical interventions had established. Partial sternotomy was contraindicated. The substernal mediastinal space was affected due to postoperative fibrosis, neovascularisation and the presence of an aortic graft. Retrotracheal, right paraesophageal and prevertebral dissection led to successful excision.

Histopathology of the lesion revealed multiple large pieces of thyroid tissue with thyroid follicles of varying size and shape, lined by uniform cuboidal cells. The cells were filled with colloid with some follicles showing cystic macrophages in the lumen.

Postoperative course of the patient was uncomplicated. One year after surgery, he is asymptomatic and disease free.

Comment

Most mediastinal goiters are retrosternally situated in the anterior mediastinal compartment. Posterior mediastinal goiters, either retrotracheal or retroesophageal, are rare. Large posterior mediastinal, contralateral retrotracheal or retroesophageal goiters are...
best removed through a combined cervical and thoracic approach.

It has been reported that skilled head and neck surgeons, with
good thyroid surgery experience, need to perform an extra-cervical
approach in 2–5% of thyroidectomies for retrotracheal goiters,
but some authors have reported an incidence of sternotomy in
29% of patients.

This variability could be correlated with the lack of uniformity in definition of a retrotracheal goiter. Initially, a goiter was
.generically considered as retro-sternal when extended below the
thoracic inlet. Later, retrotracheal goiter was defined by deSouza
and Smith as a goiter with a portion of its mass ≥50% situated in
the mediastinum. However, this definition lacks anatomic precision
and can be interpreted unspecifically. More precise definitions of
retrotracheal goiters have been suggested; namely, a goiter lying two
fingerbreadths below the thoracic inlet with the patient in a supine
position, a goiter reaching the aortic arch, or the carina tracheae,
a goiter with its inferior pole passing through the cervico-thoracic
isthmus below the subclavian vessels. Several classification systems
have also been developed in order to better classify retrotracheal
goiters. Cohen and Cho divide goiters into four grades, depending
on the percentage of goiter mass located in the mediastinum. Huins
et al proposed a classification of retrotracheal goiters based on the
relationship of goiter with anatomical structures of the mediastinum:
They defined three grades of goiter depending upon mediastinal
extension, namely, to the level of the aortic arch, to the level of the
pericardium or below the level of the right atrium.

Many attempts have been made to specifically define the factors
increasing the likelihood of sternotomy, but a general consensus has
still not been reached. Flati et al, in 2005, defined the sternotomic
approach as “inevitable” in the presence of an iceberg-shaped ret-
rotracheal goiter with >70% of the mass lying in the mediastinum.
Later, de Perrot et al, in 2007, highlighted the need to perform a
sternotomy in goiters >10 cm, in patients previously submitted to
cervical thyroidectomy, and in the presence of invasive carcinoma
or ectopic goiter. Burns et al performed a sternotomy in only 3/140
patients with retrotracheal goiter, since, in their opinion, the most
significant factors giving rise to suspicion of the need to perform ster-
notomy are CT evidence of adherence to the surrounding mediastinal
tissues and extension of the goitre to, or below, the aortic arch 27.
More recently, Cohen identified four factors significantly increasing
the need to perform sternotomy: (a) The presence of malignancy,
(b) involvement of the posterior mediastinum, (c) extension of the
goiter below the aortic arch and (d) the presence of ectopic goitre.
Cohen et al, suggests that the presence of symptoms is correlated
more with the amount of growth of the thyroid at the level of the
thoracic inlet, where the tracheae may be more easily compressed
by the presence of the sternal manubrium, than by the total mass
of the mediastinal thyroid.

Other authors have found that previous thyroid surgery could
be a factor increasing the likelihood of sternotomy, due to the fre-
quency finding of adherences with surrounding tissues. Pre-operative
estimation of thyroid volume, by means of CT scan, can be an ef-
ective predictor of which patients are likely to require a thoracic
approach. However, the final decision as to whether to perform
sternotomy can be made only intra-operatively, and the choice
is related to the experience of the surgeon. In conclusion, even if
retrosternal goiter thyroidectomy is performed by a skilled surgical
team, familiar with its unique pitfalls, the assistance of a thoracic
surgeon may be required.

References

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Diagnosis:
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