Goitres usually enlarge and descend caudad into the substernal space and are not palpable. We report on a patient whose goitre spread downward but anterior to the sternum. The thyroid mass was subsequently removed and was proven to be a papillary thyroid carcinoma. The mechanism by which a presternal goitre develops is probably due to invasion and erosion of the strap muscles and the cervical linea alba. The clinical implication of this presentation is complete extirpation of the presternal goitre with a cuff of the strap muscles.

Introduction

When goitres enlarge, they can extend beyond the boundary of the neck. Since the thyroid gland resides beneath the pretracheal fascia and the strap muscles and their attachments are connected to the top of the manubrium, goitres usually migrate down into the superior mediastinum. Substernal goitres can occur in 8.4% patients undergoing thyroidectomy.1 We have treated a patient with a malignant goitre, which spread exceptionally to the presternal region. Herein we report this unusual presentation of an extra-cervical extension of a thyroid mass and stress its association with malignancy.

Case report

A 50-year-old man presented to our out-patient clinic in January 2012 with an enlarging anterior neck mass for the past 3 years. He experienced mild pain which prompted him to seek medical advice. A dumb-bell–shaped mass was found over his anterior neck. The upper portion of the mass was about 4.5 cm in diameter and located at the suprasternal region. The lower portion was 3.5 cm in diameter and resided anterior to the sternum, about 3 cm from the upper border of manubrium (Fig 1). The whole mass migrated upward when patient swallowed which signified its thyroid origin.

Thyroid function test results were normal. Computed tomography 4 weeks later showed an isthmic thyroid mass (3.7 x 2.8 x 3.4 cm) containing micro- and macro-calcifications. The lower component of the dumb-bell–shaped mass was anterior to the sternum (Fig 2), and there was no substernal extension.

The patient was very keen to undergo surgery, but he declined fine-needle aspiration of the mass. Total thyroidectomy with a collar incision was performed 3 weeks later. The 4.5 x 5 cm isthmic thyroid mass passed through the midline fascia (between the strap muscles) and reached the presternal area. The muscle attachments of the strap muscles were at their normal positions on the manubrium. Total thyroidectomy including the entire dumb-bell mass en bloc with surrounding strap muscles and deep fascia was performed.

Histopathology revealed papillary thyroid carcinoma in both the superior and inferior components of the dumb-bell mass. The resection margin was clear. Postoperative radioactive iodine ablation 80mCi was given 5 months after the initial...
Malignant presternal goitre

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Discussion

Substernal goitre is uncommon. Presternal goitre is even rarer. We searched the literature in MEDLINE and came across only two reported cases. The first reported by Raman and Nair² in 1999 was a papillary thyroid carcinoma. The second described by Brilli et al³ in 2007 was a benign nodular goitre. We report this third case of a presternal goitre, which was also a papillary thyroid carcinoma. Therefore, if a thyroid mass spreads presternally, malignancy should be suspected. In our patient, malignancy was not suspected initially due to little knowledge about presternal goitres at that time. Therefore, an intra-operative frozen section was not obtained. We now realise the high risk of malignancy for this entity, and that preoperative fine-needle aspiration cytology or intra-operative frozen section examination should be performed in all such cases, and better informed consent regarding surgery should be obtained. Moreover, the extent of operation can also be more appropriately determined. In addition, preoperative imaging yielding micro-calcification in the goitre as well as presternal extension, or both should heighten the possibility of an underlying papillary carcinoma.

The mechanism resulting in the more common substernal goitre was speculated to the negative intrathoracic pressure during inspiration and the downward pull of gravity.⁴ By contrast, presternal migration of a malignant thyroid mass (as in our patient) was probably due to tumour erosion of the cervical linea alba between the strap muscles. Prompt investigation with imaging and fine-needle aspiration therefore seems imperative to make an accurate diagnosis and offer early therapy. Such patients should be advised to undergo total thyroidectomy. Notably, the thyroid masses should be removed en bloc with the adjacent strap muscles in order to achieve a clear resection margin.

Presternal goitre is rare and likely to represent thyroid malignancy eroding the cervical linea alba and strap muscles. Total thyroidectomy including a cuff of strap muscles encircling the mass should be performed to ensure complete tumour extirpation.

References