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# Multinodular goiter with a retropharyngeal extension: A report of two cases and literature review

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## Abstract:

Multinodular goiter (MNG) is a chronic benign nodular enlargement of the thyroid gland. It presents as an anterior painless neck mass, potentially progressing to exert pressure on the trachea and esophagus and giving rise to compressive symptoms. MNG is a common thyroid gland disorder; however, retropharyngeal goiter is considered rare with few reported cases. We report the cases of two patients who presented to our institution with MNG with retropharyngeal extension: a 62-year-old female patient who presented with a progressive anterior neck mass with dilated neck veins; and a 49-year-old male who presented with a painless anterior neck mass. Both patients successfully underwent total thyroidectomy with an uneventful postoperative recovery. The clinical presentation of MNG with retropharyngeal extension varies with patients; hence, a high index of suspicion is of the utmost significance. While the retropharyngeal extension does not cause compressive symptoms, it should raise the suspicion of a large retrosternal component.

## Keywords:

Multinodular goiter, retropharyngeal goiter, thyroid gland, thyroidectomy

## Introduction

Multinodular goiter (MNG) is a chronic benign nodular enlargement of the thyroid gland.<sup>[1]</sup> It is a common thyroid gland disorder with an estimated incidence of 4% and 10% found in iodine-sufficient and iodine-deficient countries, respectively.<sup>[1]</sup> MNG presents as an anterior painless neck mass which exerts pressure on the trachea and esophagus leading to compressive symptoms with further enlargement.<sup>[1]</sup> Thyroid goiters often extend caudally; hence, few cases of retropharyngeal extension are reported in the literature.<sup>[2-8]</sup> We report the cases of two patients with MNG with a large retropharyngeal extension.

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## Case Reports

### Case 1

A 62-year-old female patient, known to have diabetes mellitus (DM) and hypertension (HTN), presented to Otorhinolaryngology-Head and Neck Surgery (ORL-HNS) clinic for the evaluation of a progressive neck mass that she noticed 1 year before presentation. The patient did not complain of pain, dyspnea, dysphagia, dysphonia, or stridor, neither did she present with symptoms of hyper/hypothyroidism. She also denied any history of fever, weight loss, or night sweats. She has no history of smoking, alcohol consumption, radiation exposure, or a family history of malignancy or thyroid disease.

Clinically, a huge anterior neck mass was palpated with an obliterated suprasternal

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notch. Dilated neck veins with collateral formation on the anterior chest wall with facial congestion were noted. Flexible nasopharyngoscopy demonstrated bulging of the retropharyngeal area and bilaterally mobile vocal folds.

Thyroid function tests (TFTs) showed that she was euthyroid. On ultrasonography, both thyroid lobes and isthmus were significantly enlarged with retrosternal extension, demonstrating heterogeneous variable-sized nodules with foci of calcification consistent with TIRADS 4. Computed tomography (CT) with contrast of the neck of this patient is shown in Figure 1. On sestamibi parathyroid scan, a small ectopic parathyroid adenoma localized medial to submandibular salivary gland was seen. A fine-needle aspiration of the mass revealed atypia of undetermined significance in the right lobe (Bethesda III) and benign follicular nodule in the left lobe (Bethesda II) along with a right ectopic parathyroid adenoma.

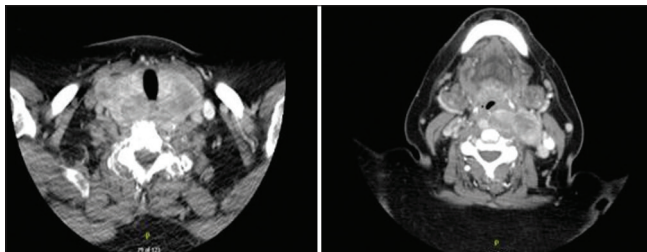
The patient underwent total thyroidectomy, median sternotomy, and partial thymectomy mediastinal mass excision. An enlarged thyroid gland outspreading to the retropharyngeal area was successfully extracted. The postoperative recovery of the patient was uneventful. Postoperative flexible nasopharyngoscopy revealed bilaterally mobile vocal folds. Histological examination revealed follicular nodular disease with degenerative changes without evidence of malignancy.

## Case 2

A 49-year-old male patient, known case of DM and HTN, presented to ORL-HNS clinic for evaluation of a painless anterior neck mass that he first noticed 3 months before presentation. The systemic review was unremarkable.

Clinically, the patient had a 3 cm × 4 cm midline painless neck mass with an unpalpable suprasternal notch, mobile with swallowing. Flexible nasopharyngoscopy demonstrated bulging of the retropharyngeal area and bilaterally mobile vocal folds.

TFT demonstrated that the patient was euthyroid. CT scan is shown in Figure 2. The patient underwent



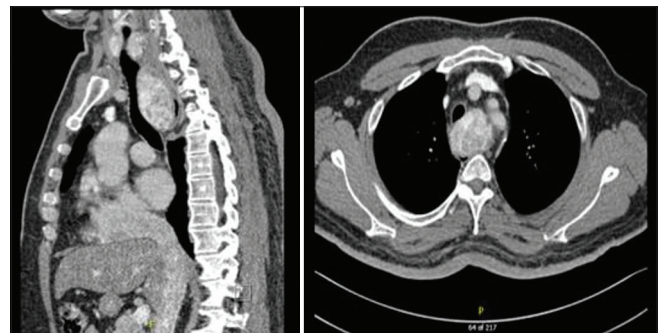
**Figure 1:** Computed tomography neck with contrast: Large longitudinal heterogeneously enhancing thyroid mass, spanning the distance from C3 to T5, extending superiorly the level of hypopharynx, posteriorly with retropharyngeal extension and inferiorly through the thoracic outlet into the retrosternal area

a total thyroidectomy. An enlarged thyroid gland outspreading to the retropharyngeal area was successfully extracted. The postoperative recovery of the patient was uneventful. Postoperative flexible nasopharyngoscopy revealed an improved airway with immobile left vocal cord in paramedian position with a mobile compensated right vocal cord. Histological examination revealed MNG with hyperplasia without evidence of malignancy.

## Discussion

The thyroid gland is located within the anterior triangle of the neck, lying in close proximity to the larynx and trachea. It is invested in the pretracheal fascia, which effectively tethers it to the larynx and trachea. The pretracheal layer of the deep cervical fascia extends inferiorly from the hyoid into the thorax. It is formed by two parts: a muscular part, enclosing the infrahyoid muscles, and a visceral part, enclosing the thyroid gland, trachea, and esophagus. The visceral part, in particular, is continuous posteriorly and superiorly with the buccopharyngeal fascia, the space housed within which is known as the retropharyngeal space, which extends from the level of the skull base to the posterior mediastinum.

Should the thyroid gland enlarge as a result of any pathological process, an upward expansion of the gland is limited by the pretracheal fascia and the attachment of the sternothyroid muscles to the thyroid cartilage. Owing to the fascial planes surrounding the thyroid gland, the usual path of growth is a caudal expansion resulting in substernal or retrosternal goiter. Retrosternal goiter can potentially compress the trachea and esophagus, resulting in symptoms of dyspnea and dysphagia, respectively, and can cause severe venous compression. It is considered uncommon, however, for the thyroid gland to extend into the retropharyngeal space, as in the two cases we described above.



**Figure 2:** Computed tomography neck with contrast: Thyroid gland is diffusely heterogeneously enlarged with retropharyngeal extension of the left thyroid lobe into the retrotracheal location and tracheal compression extending into the arch of aorta level

**Table 1: Clinical characteristics of previously reported cases of retropharyngeal extension of multinodular goiter**

	Age	Sex	Clinical presentation	Thyroid hormone level	Clinical size of thyroid gland	Management	Histopathology
Our patient (2022)	49	Male	Asymptomatic	Euthyroid	Enlarged	Total thyroidectomy	MNG with hyperplasia
Our patient (2021)	62	Female	Asymptomatic	Euthyroid	Enlarged	Total thyroidectomy + sternotomy	Follicular nodular disease (MNG)
Alhedaithy <i>et al.</i> <sup>[2]</sup>	70	Male	Asymptomatic	Euthyroid	Enlarged	Total thyroidectomy	Hashimoto thyroiditis
Thomas <i>et al.</i> <sup>[3]</sup>	53	Male	Dysphagia Dyspnea	NA	Enlarged	Total thyroidectomy	Multinodular hyperplasia, and an incidental papillary microcarcinoma (0.6 cm) was found in the left lobe
Lakhani <i>et al.</i> <sup>[4]</sup>	63	Male	Dysphagia Dysphonia Dyspnea	Euthyroid	Enlarged	Total thyroidectomy	Nodular colloid goiter
Atasoy <sup>[5]</sup>	78	Male	Dysphagia Dysphonia	Euthyroid	Enlarged	Total thyroidectomy	Multinodular colloidal goiter
Som and Shugar <sup>[6]</sup>	71	Female	Dyspnea	Euthyroid	Enlarged	Total thyroidectomy	MNG
Som and Shugar <sup>[6]</sup>	79	Female	Dyspnea	Euthyroid	Enlarged	Total thyroidectomy	MNG
Kenyon and Robb (1983) <sup>[7]</sup>	57	Male	Change in voice	Hypothyroid	Normal	Biopsy	NA
Soboroff <sup>[8]</sup>	42	Female	Noisy breathing	Euthyroid	Enlarged	Total thyroidectomy	NA

NA=Not applicable, MNG=Multinodular goiter

The occurrence of retropharyngeal goiter has been previously reported in the literature, as summarized in Table 1.<sup>[2-8]</sup> Most patients presented clinically with symptoms of dyspnea, dysphagia, and dysphonia. This is in contrast to both of our patients who presented with an asymptomatic neck mass, similar to a case of MNG reported by Alhedaithy *et al.*<sup>[2]</sup> In a retrospective study by Ching *et al.*, six patients were reported to have massive goiters with retropharyngeal extension, three of which had presented with dysphagia (50%), one also had associated dyspnea (16.6%), while three were asymptomatic on presentation (50%).<sup>[9]</sup>

Cases of retropharyngeal goiter reported in the literature were primarily of MNG on histopathology. Of note, a previously reported case of MNG was diagnosed on histopathology as Hashimoto's thyroiditis.<sup>[2]</sup> Khan *et al.*, reported the case of a 35-year-old female patient with retropharyngeal goiter who presented with dysphagia, dysphonia, and dyspnea, which was later revealed on histopathology as Riedel's thyroiditis.<sup>[10]</sup> MNG with retropharyngeal extension cases in the literature were managed with total thyroidectomy. Similar to the cases we describe above, patients were managed with total thyroidectomy, with the first requiring a sternotomy as well to access the goiter.

## Conclusion

These cases presented here highlight the significance of understanding the structure of the thyroid gland, neck spaces, and surrounding fascial planes to appreciate its path of growth. The clinical presentation of MNG with retropharyngeal extension varies with patients; therefore,

a high index of suspicion is highly significant in patients with compressive symptoms. While the retropharyngeal component does not result in compressive symptoms, they should raise the suspicion of a large retrosternal component.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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