

# A 75-YEAR OLD PATIENT WITH MULTINODULAR GOITER COMPLICATED WITH MITRAL STENOSIS AND CHRONIC PULMONARY DISEASE – THE IMPORTANCE OF SURGEON-PERFORMED ULTRASOUND

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**Abstract:** *Introduction: We describe the management of a 75 year old patient with chronic obstructive pulmonary disease (COPD), II New York Heart Association (NYHA) class heart failure, mitral stenosis and hypertension who presented with mild respiratory distress and dysphagia secondary to compression from a multinodular goiter. In order to properly manage this case, we reviewed the current State of the Art on multinodular goiter in patients with multiple associated pathologies. Results: A multidisciplinary team was assembled including anesthesiology, cardiology and otolaryngology specialists. The patient underwent a cervicotomy with the removal of the compressive thyroid goiter. Conclusions: Airway obstruction and swallowing problems from extra-tracheal compression in a patient with coexistent morbidity represent a unique management dilemma. Therefore, we relied on surgeon-performed ultrasound exam to ascertain all the risks and the possibility of surgical removal of the thyroid mass. The ultrasound exam enabled the correct and complex surgical planning along with an improved resident training concerning the procedure.*

## INTRODUCTION

The thyroid gland is located in the anterior region of the neck where it covers the lateral part of the thyroid cartilage on both sides, whereas its isthmus covers the cricoid cartilage and the first tracheal ring.(1,2)

It is the largest single organ that is specialized in producing endocrine hormones. The thyroid produces thyroxine (T4) and triiodothyronine (T3). The main functions of the thyroid are control of the oxygen consumption, body growth, mental development, regulation of heat and the regulation of heart rate and myocardial contraction.(1)

The thyroid is susceptible to diseases that are relatively common among the general population. The term goiter refers to an enlarged thyroid gland that can be diffuse or nodular. From the point of view of thyroid functionality, the goiter can be nontoxic when thyroid function is normal, toxic goiter when there is hyperthyroidism and underactive when there is hypothyroidism. The thyroid growth and function are controlled by the hypothalamic-pituitary-thyroid axis by iodide through elements of self-regulation. The lack of T3 and T4 signals the hypothalamus to release thyroid releasing hormone (TRH). This releases thyroid stimulating hormone (TSH) from the pituitary that stimulates the production of thyroid hormones. Goiter appears when a deficiency in synthesis of thyroid hormones or intake leads to increased TSH production.

The major causes of thyroid hormone deficiency include genetic errors in thyroid hormone synthesis, iodine deficiency.(3)

The Wickham study is one of the largest studies of thyroid problems in a population. The study revealed that the female to male ratio is about 4:1.(4)

As for race, there is no racial predilection goiter affecting endemic goiter zones where iodine deficiency remains a problem. In these areas, about 90% of the population has

goiters.(5)

Most patients with nontoxic goiter remain asymptomatic while the size of the goiter is small. Over a period of time the goiter increases in size and due to its anatomical position begins to produce pressure symptoms in the neck such as dyspnea, dysphagia, or hoarseness.(6)

In the case of toxic goiters, the symptoms include fine tremor, weight loss, tachycardia, exophthalmia, motor and psychological agitation and sleeplessness.(7,8)

Ultrasound exam is considered the first imaging modality used in the management of these large volume thyroid masses. However there is still a debate whether the planning of the surgical procedure should rely on the ultrasound performed by the imaging specialist or performed first hand by the surgeon.(9,10)

## PURPOSE

We present a complex case of an elderly patient with multiple associated pathologies undergoing surgical removal of a large multinodular goiter underlining the importance of surgeon-performed ultrasound in the planning of the procedure, resident training and prevention of malpractice.

## CASE REPORT

A 75-year old patient ex-smoker presented in Colțea Hospital ENT's department for dysphagia, mild respiratory distress and a large anterior neck swelling. He was admitted for further investigations. When queried about the neck mass, the patient said that he had it for approximately 3 years and that the mass grew in size in that period. The patient had no relevant family history, but was living in an iodine deficient area. As for morbidities, the patient was known with hypertension, mild COPD, a class II NYHA heart failure, mitral stenosis and atrial fibrillation. The patient was undergoing treatment for

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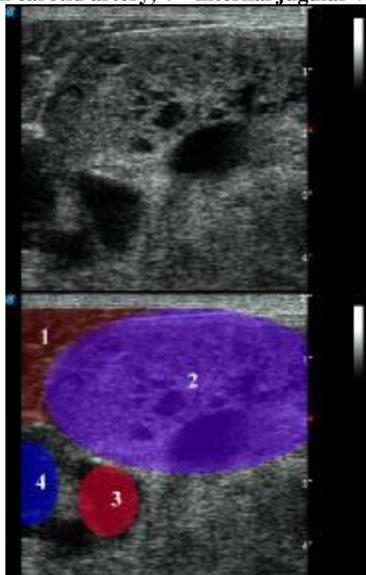
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hypertension heart failure and COPD and also was taking 3 tablets of thyrozol a day. On examination, the mass was firm, mobile, non tender and measured about 6-7 cm in diameter. The mass moved up with swallowing. Upon auscultation of the mass a bruit was heard. The general examination showed a diminished breath sounds, pleural rubs bilateral basal and a mid-diastolic murmur, with a blood pressure of 120/80, 66 beats per minute (BPM), and oxygen (O<sub>2</sub>) saturation of 95%. The Ear Nose Throat (ENT) examination shows no added pathologies except for the neck swelling. The electrocardiogram (ECG) showed signs of first degree atrium-ventricular (AV) block. Laboratory test showed high white blood cells count (WBC) and high platelets about 637\*1000 $\mu$ l and an international normalized ratio (INR) of 1.43. A multidisciplinary team was assembled including anesthesiology, cardiology, hematology and otolaryngology specialists and examined the patient. He undertook a cervical ecography and a cardiac ecography which showed a diminished aortic valve. The cervical ecography findings were consistent with a multinodular goiter. The patient undertook a hematological exam due to WBC and platelets numbers. It was recommended that after the removal of the neck mass it should undergo imunohistochemistry and genetic search for a Janus Kinase 2 (JAK 2) mutation to rule out essential thrombocytosis.

All the risks were explained to the patient and consent for a potential surgery was made. For the cardiologic disease the patient took an antiplatelet pill which increased the risk of bleeding during and after the surgery. The treatment was stopped after indications from the cardiologist. The cardiology exam also revealed a mitral stenosis for which further investigations were made. The cardiac ecography showed mild mitral stenosis, the ejection fraction was 60% and no other problem in cardiac motion was detected.

The cervical sonography was made to establish the relation of the neck mass with the carotid common artery due to the fact that a bruit was heard during auscultation of the mass. The results showed no relation between the structures making the removal of the mass possible from surgery point of view, figure no. 1.

**Figure no. 1. Neck sonography depicting the close relationship of the thyroid mass with adjacent vascular structures. 1 – sternocleidomastoid muscle, 2 – thyroid mass, 3 – common carotid artery, 4 – internal jugular vein**



The COPD the patient presented was mild and the patient undertook treatment for it. Because of the symptomatology of the patient, respiratory distress and dysphagia along with the cosmetic aspect of the mass, it was decided to remove the neck mass under general anesthesia. The patient was prepped and with the consent of both surgeon and anesthesiologist the mass was removed (figure no. 2).

**Figure no. 2. Intraoperative aspect of goiter**



The result of the intraoperative pathology exam was consistent with multinodular goiter. Postoperative care was given to the patient and he was hospitalized for 10 days after the surgery. The outcome was good and the patient was checked out.

## DISCUSSIONS

In the literature, the surgical removal of an asymptomatic goiter is advised only when its symptoms are debilitating for the patient. Patients will undergo surgery if the size of the goiter is large and affects the cosmetic appearance of the patient, or when its size provokes pressure neck symptoms such as dysphagia or dyspnea.

In the case of the elderly with multiple morbidities associated, surgery is reserved strictly for symptomatic goiter, medical treatment being the option of choice.

The particularity of the case presented is that the goiter, although under treatment, grew in size and started to pressure anatomical structures in the neck.

Because therapy did not prevent the goiter from increasing and neck pressure symptoms appeared, surgery was

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taken in account.

The multiple cardiopulmonary morbidities as well as the age of the patient were factors to take in consideration when the decision for surgery was made. The team of multidisciplinary specialties examined the patient. The question was whether the patient could undergo general anesthesia.

Sharma et al (5) reported acute respiratory failure in a 64-year-old woman with a long-standing goiter. This required emergency total thyroidectomy and histopathology revealed a benign multinodular goiter with minimal intrathoracic extension but no compression of the retrosternal trachea.

Testini et al (6) described six cases of goiters presenting with acute airway obstruction out of a total of 919 patients who underwent thyroidectomy. However, only two of these (0.2%) were confirmed to be benign by histology, one of which was noted to have had massive parenchyma hemorrhage.

Whether the cardiac symptoms of the patient were related to the goiter or not is still unknown. It is possible that the paroxysmic atrial fibrillation the patient said to have is related to the goiter.

At the 2-week follow up, the patient was in great condition and the healing process was as expected. The patient was not experiencing dysphagia or dyspnea anymore, as for the cosmetic aspect the only inconvenient was the incision scar.

### CONCLUSIONS

Surgical treatment in goiter cases should only be considered when neck pressure symptoms appear. In the case of elderly this option should be considered only after close examination of the patient. The ultrasound exam performed first hand by the ENT surgeon permitted the correct and complex analysis of neighbouring anatomic structures and prevention of possible incidents during the surgery. Moreover, the patient himself could ascertain the risk of the procedure and the residents in training could visualize all the steps of the surgical plan.

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