

## Management Of Toxic Multinodular Goiters.

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### Abstract

#### Introduction:

Goiter is a very common endocrine pathology worldwide. The aim of this study is to study the epidemiological, clinical, biological, radiological, therapeutic and post-operative profile of multi-nodular toxic goiters treated in the general surgery department, Seti University Hospital.

#### Patients and methods:

Between January 2017 and December 2023, 134 patients were operated on for toxic multi-nodular goiter in the general surgery department, Seti University Hospital.

Epidemiological, clinical, radiological and therapeutic data were analyzed from the files of operated patients according to a retrospective study.

#### Results:

One hundred and thirty-four patients were operated on over a period of 7 years. The female gender was dominant (58%). Clinical signs of thyrotoxicosis were present in all patients, mainly tachycardia and palpitations. Ultrasound revealed multi-nodular goiters in all patients. Hormonal dosage showed a decrease in TSH (us) in all cases and an increase in T4 in % of patients. Medical preparation was carried out in all patients before total thyroidectomy. Morbidity consisted of temporary recurrent damage, transient hypocalcemia and postoperative hematoma.

#### Discussion:

Surgical treatment is the standard treatment for toxic multinodular goiters. The management of toxic multi-nodular goiters requires medical preparation before any surgical procedure.

#### Conclusion:

Toxic multi-nodular goiters require preoperative medical preparation to avoid intraoperative bleeding and the occurrence of thyrotoxicosis attacks postoperatively.

**Kew Words:** tang-pre;operative medical preparation;total thyroidectomy;hormone replacement therapy

### Introduction

Goiter is defined as an enlargement of the thyroid gland. It can present either in the form of diffuse hypertrophy, in the form of localized hypertrophy or in mixed form. When the thyroid gland contains two or more nodules, it is called a nodular or multi-nodular goiter. It can be benign, toxic or malignant.

Multi-nodular goiters create a goitrous endemic in the north of the wilaya of Seti. Toxic multi-nodular goiters have a particular entity in thyroid pathology due to their symptomatology. Multi-nodular goiters are benign but their toxicity can be life-threatening for affected patients. The management of toxic multinodular goiters requires close collaboration between

endocrinologist, sonographer, cytopathologist and surgeon. Surgery is the radical treatment for these goiters.

The objective of our study is to study the epidemiological, clinic-biological and therapeutic characteristics and to evaluate the morbidity of surgery for toxic multi-nodular goiters operated on in the general surgery department, Seti University Hospital.

#### Patients and methods:

Retrospective study over a period of 7 years (from January 2, 2017 to December 30, 2023) of 134 cases of toxic multi-nodular goiters operated on

in the general surgery department, Sétif University Hospital. In all cases, the duration of the goiter exceeded five years of development. The clinic was dominated by signs of thyrotoxicosis in all patients, mainly tachycardia. Ultrasound showed multi-nodular goiters. TSH (us) was measured in all patients, however T4 hormonal dosage was requested only in a few cases. Scintigraphy was performed in only a few patients. Chest x-ray showed dipping goiters. A chest CT scan was requested to clearly visualize the limits of the plunging goiters. Fine aspiration was requested in all patients. Pre-operative medical preparation was done in all patients. Total thyroidectomy was performed in one hundred percent.

### Results:

The frequency of toxic multi-nodular goiters was 11 % compared to the number of multi-nodular goiters operated on in the department. The female gender was dominant in 58 % (n = 78) versus 42 % (n = 56) of men. The age group most affected, identical in both sexes, was between 45 and 65 years old. Thyroid ultrasound showed more than three nodules distributed in both thyroid lobes. Chest x-ray showed a plunging goiter and confirmed by CT scan in 5 cases. The TSH level (us) collapsed in all patients. All patients responded to treatment (carbimazole) given by the endocrinologist. Morbidity was marked by dysphonia (recurrent damage) in 14 % of cases, dysphagia in 5 % of cases, hypocalcemia (parathyroid damage) in 8 % of cases and an immediate post-operative hematoma in two patients (plunging goiter).

Postoperative mortality was zero. Histology revealed papillary carcinoma in 7% and benign goiters in 93 % of cases. The patients were put on replacement therapy.

### Discussion:

Goiter is a very common endocrine pathology which affects 15.8 % of the world population [1]. The north of the wilaya of Seti (eastern Algeria) is a region endemic for goitrous pathology. Toxic multinodular goiters are characterized by their age [2] generally exceeding 5 years in our series. Their frequency varies between 16 and 22 % [3]. Toxic multinodular goiter is very common in women, like all thyroid

pathology [4]. In our series, 58 % women and 42 % men were collected with a M/F sex ratio of 0.7. These data have been reported in the literature [5]. The age most affected is between 50 and 65 years old [6]. The age range of our patients is almost identical to that found in all series. Lower anterior cervical swelling was the reason for consultation in all patients. Palpation of the goiter revealed nodules. The diagnosis of toxic multinodular goiters was clinical, made of tachycardia and/or palpitations and confirmed by biology (us TSH dosage). The TSH assay has a high sensitivity for detecting thyroid dysfunction. Patients may be asymptomatic. Tachycardia and palpitations were present in all our patients.

The low TSH level (us) revealed hyperthyroidism confirmed by the measurement of free thyroid hormones (T4 –T3). A TSH level outside the norms will justify confirmation by a dosage of free T4 and even more so free T3. Endocrine signs in the form of hyperthyroidism complicate the development of a multi-nodular goiter.

Hyperthyroidism can be the first clinical manifestation of a goiter; its frequency is around 50 % according to studies [7]. Cervical ultrasound is requested for any cervical swelling. It was done in all our patients.

Therapeutic management of toxic goiters is exclusively surgical. It is an act requiring the combination of multidisciplinary skills (endocrinologist, radiologist, anesthesiologist, resuscitator and surgeon). Total thyroidectomy

was the treatment of choice in one hundred percent. The results of total thyroidectomy in our patients were 14 % dysphonia (recurrent damage), 8 % transient hypocalcemia (parathyroid damage, 5 % dysphagia and 1% postoperative hematoma (richly vascularized gland). Blind manipulation without visual identification of the recurrent nerve increases the risk of its injury [8]. Hypoparathyroidism is very risky in total thyroidectomies.

It is imperative to identify and preserve at least the superior parathyroids, which have a more constant anatomical position [9]. Hypoparathyroidism often prolongs the length of hospital stay [10]. The patients received calcium loads intravenously in a hospital environment then calcium orally. Dysphagia is probably caused by a localized burn from the electrocautery to ensure hemostasis.

Thyroid surgery is a vascular surgery requiring careful procedures to avoid bleeding in the thyroid compartment, especially in the first post-operative hours. Pathological examination confirmed the benignity of the goiter in 93% of cases. Papillary carcinoma was found in 7 % of cases. Replacement treatment is necessary for life.

### Conclusion:

Toxic multi-nodular goiters are a particular entity of goiters. Their particularity lies in that they are multi-nodular, bilateral and toxic. Surgery is the treatment of choice.

Total thyroidectomy is the radical treatment. Preoperative medical preparation is essential to avoid hemorrhagic bleeding intraoperatively and an attack of thyrotoxicosis postoperatively. Hormone replacement therapy after total thyroidectomy is indicated for life. To prevent multi-nodular goiters, use iodized salt in the diet, eat seafood rich in iodine and above all avoid excessive exposure to radiation.

The authors declare no conflict of interest.

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