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Giant Multinodular Goiter with Dyspnea

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Abstract **Case Report**

Introduction: Multinodular goiter (MNG) involves an enlarged thyroid gland, is accompanied by obstructive symptoms such as dyspnea, it carries an indication for surgery. ***Case Presentation:*** We present a case of 49-year old male with multinodular goiter with a rapid increase in size within 3 years. he also reported palpitation, breathlessness on exertion, tachycardia. Computed tomography scan of the neck shows a gross enlargement of thyroid gland across both sides of the neck. The fine needle aspiration cytology and final histopathological examination were suggestive of MNG with adenomatous nodules. A total thyroidectomy was performed and the gland was dissected successfully. ***Discussion:*** MNG is most effectively treated by total thyroidectomy, which achieves complete diminution from symptoms. ***Conclusion:*** Surgery for huge goiter is challenging and one should be careful about difficult intubation, altered anatomy and adhesions to the surrounding structures. Recognizing and treating this kind of cases are important, as they constitute a preventable cause of mortality if timely diagnosed and treated.

Keywords: Multinodular goiter, Total thyroidectomy, Dyspnea, Case report, Thyroid gland, Adenomatous nodules.

1. INTRODUCTION

Among the endocrine disorders, thyroid diseases are quite common and have a significant burden to many countries especially morocco[1]. Studies show that it has been estimated that about 27% are suffering in morocco [2]. Thyroid growth is dependent on thyroid stimulating hormone (TSH), secreted by the pituitary gland and an enlarged thyroid gland is called a goiter. The TSH receptor agonists or antibodies stimulate the TSH receptors leading to diffuse goiter formation. A goiter is either diffusely enlarged or of nodular type. It can also be non-toxic (euthyroid), toxic (hyperthyroidism) or underactive (hypothyroidism). Increasing age, less iodine intake and exposure to external irradiation are the usual causative factors.

Generally, nodular goiters are more common in women than in men [3]. Those with normal TSH levels, goiters may be asymptomatic, or it may be associated with systemic thyrotoxic symptoms (toxic MNG or Plummer's disease) [4]. Multinodular goiters (MNG) usually grow slowly, however, the enlargement of substernal MNG may cause mechanical compression of the trachea and esophagus causing dyspnea and dysphagia respectively. Either surgery or radioiodine treatment is strongly recommended for patients with toxic MNG [5]. Toxic nodular goiter can be a single toxic adenoma (single hyper-functioning nodule) within a multinodular thyroid or multiple hyperfunctioning nodules in the multinodular gland [6].

In this case report, we have diagnosed a patient with giant MNG and mass effects, managed by total thyroidectomy. This case report has been reported in line with the SCARE criteria [7].

2. CASE REPORT

A 49-year-old male with long-standing neck swelling and dyspnea had been diagnosed as a case of MNG. The had Type II Diabetes Mellitus and hypertension for 3 years, which were under good control with medications. The size of the neck swelling was increasing gradually but the patient complained about the rapid increase in size for the past 3 years (Fig. 1). He complained of palpitation and breathlessness on exertion and was dyspnoeic on examination. Tachycardia were present on examination. There was no dysphagia or change in voice on presentation. Laryngoscopy conducted preoperatively showed supraglottic edema and tracheal compression with normal vocal cord mobility. Thyroid function test was conducted and showed normal levels at the time of surgery. Contrast-enhanced computed tomography on the neck was done suggestive of gross enlargement of thyroid gland across

both sides of the neck (more on the left side) (Fig. 1). Right lobe measures approximately 18× 10 × 9 cms and left lobe measures approximately 20 × 12 × 11 cms (Fig. 2). The carotid vessels and internal jugular vein were displaced posterolaterally by the enlarged thyroid gland. The trachea appears compressed by the enlarged gland and there was no retrosternal extension or extracapsular extension seen. The fine needle aspiration cytology (FNAC) report was suggestive of MNG with adenomatous nodules. Final histopathological examination was suggestive of MNG.

Total thyroidectomy was done under general anaesthesia. A horizontal neck incision was given over the neck swelling extending bilaterally up to the mastoid tip (Fig. 3). Strap muscles and sternocleidomastoid muscles were thinned out and were adhered with the thyroid. Strap muscles and Sternocleidomastoid muscles were cut for better exposure, and then resuturing was done at the end of surgery. Bilateral Internal jugular vein (IJV) and Carotid vessels were displaced posterolaterally and both IJV were compressed. Both side IJV and carotid vessels were identified, dissected out from the specimen and preserved. Both the superior laryngeal nerve (SLN) could not be preserved and sacrificed. Bilateral recurrent laryngeal nerve (RLN) were identified in Beahr's triangle and dissected out from the specimen and preserved. Bilateral

RLN adhered with the thyroid and both sides inferior parathyroid were identified and preserved. The pyramidal lobe of thyroid was enlarged and seen extending into the pre-epiglottic space and excised along with the specimen and there was no breach in the mucosal lining of larynx or pharynx. Bilaterally 14Fr romovac suction drain kept into the wound and wound repaired in layers. The patient was not extubated immediately for the fear of airway oedema.

The patient was extubated on the next hour and she was maintaining oxygen saturation around 95%. Her voice was breathy and in the evening of the postoperative day-1. Both drains were removed on postoperative day-2.

Fig. 1: Shows the huge thyroid swelling with anterior and lateral views

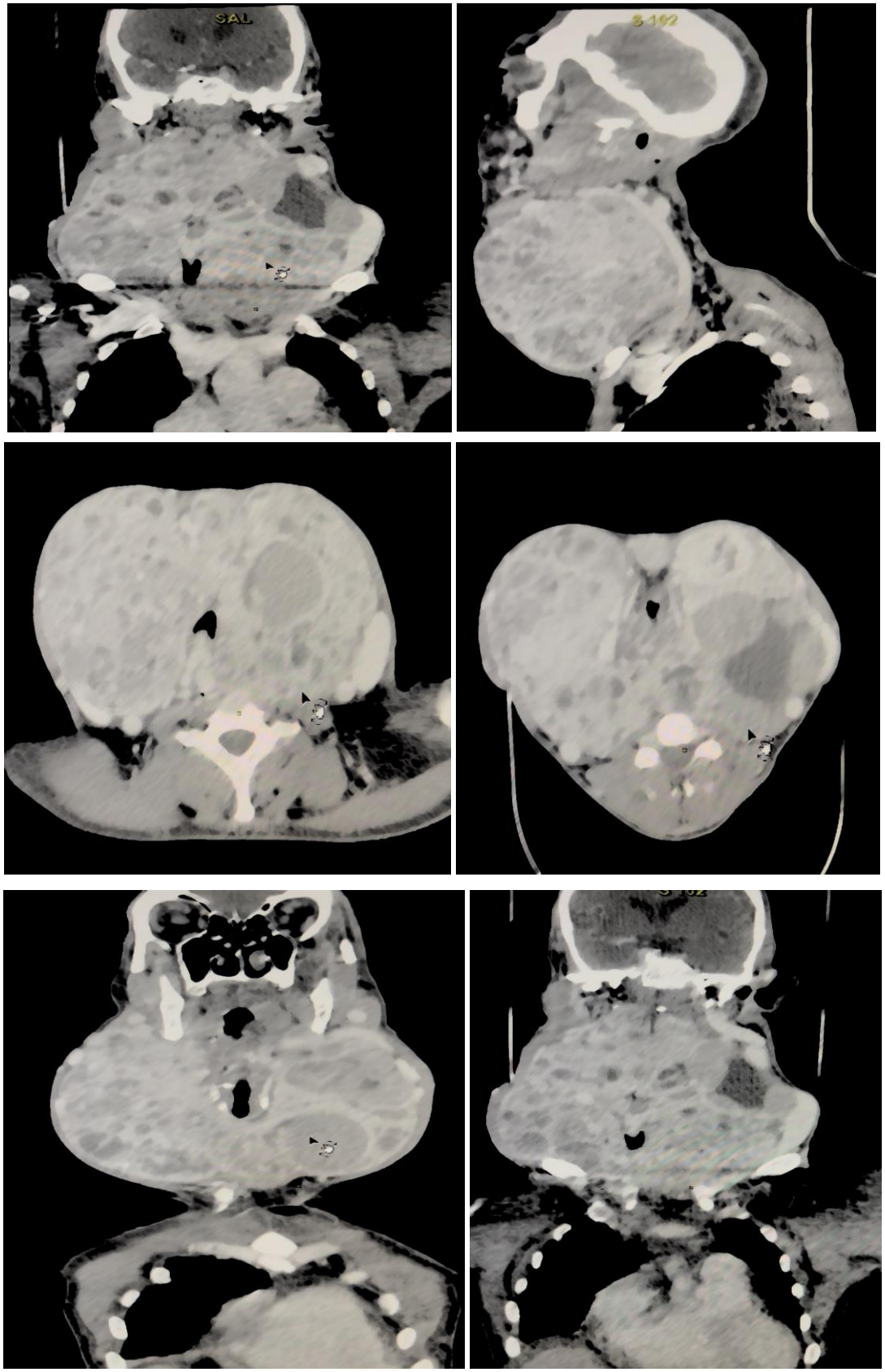

Fig. 2: Shows Computed Tomography of the Neck with thyroid swelling more on the left with tracheal compression and no retrosternal or extracapsular extension. It also shows the displacement of the internal jugular vein and carotid posterolaterally

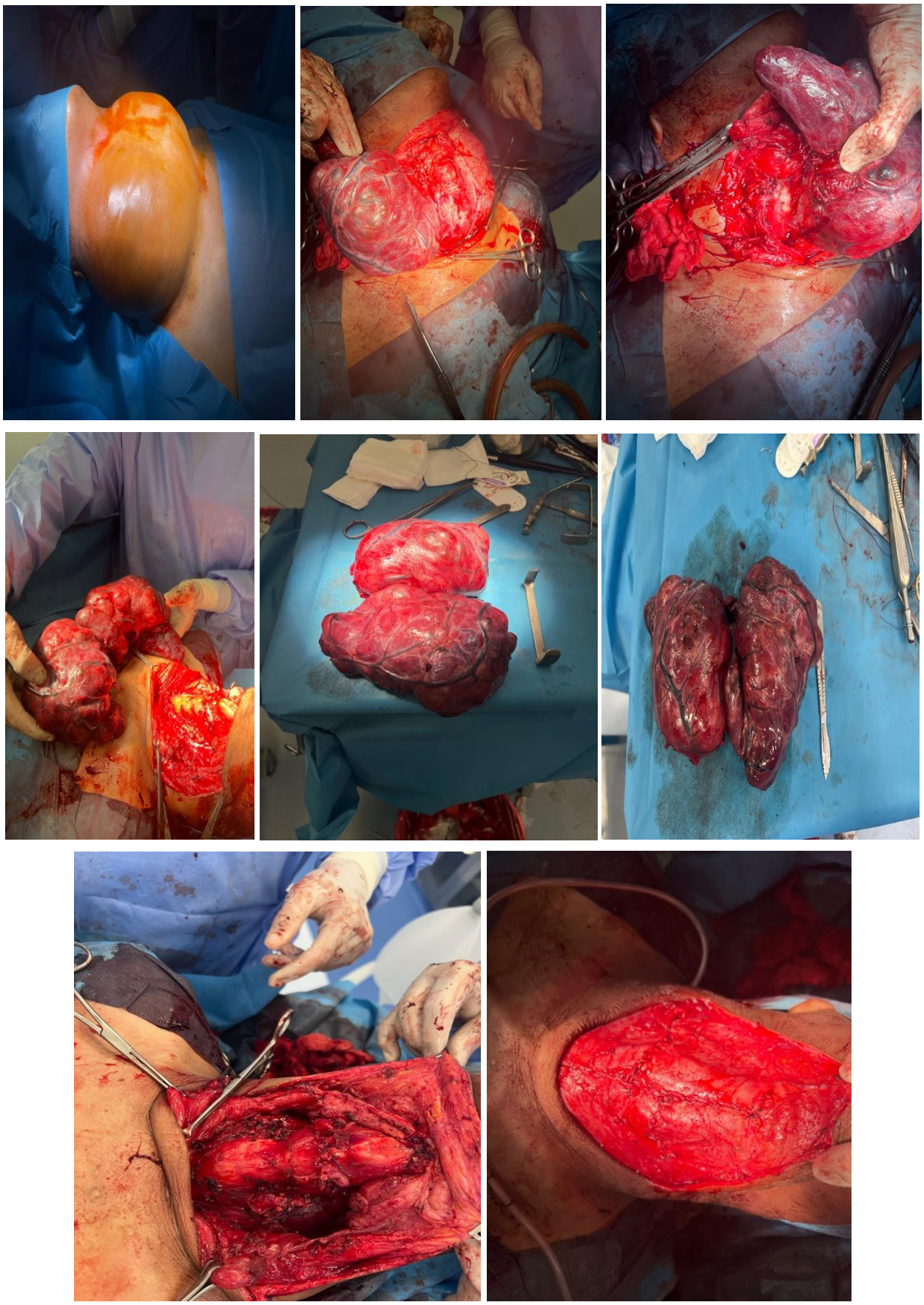

Fig. 3: Shows intraoperative findings, Horizontal neck Incision, Exposure of the gland, Extension of pyramidal lobe into the pre-epiglottic space, Specimen after removal

3. DISCUSSION

Most of the patients develop MNG due to iodine deficiency (endemic goiter) or by medication, growth-stimulating antibodies, and inherited defects in thyroid hormone synthesis [8]. Many patients present with huge thyroid enlargement resulting in pressure symptoms like dyspnea and dysphagia. The patients having hypothyroid MNG, levothyroxine is recommended to suppress TSH level [9] which acts as a growth factor for thyroid epithelial cells. Although some studies favour this TSH suppressive therapy, others have raised a question on the efficacy of treatment [10] and deleterious effects of subclinical hyperthyroidism. Radioiodine therapy is effectively used in toxic MNG resulting in improvement of pressure symptoms in the majority of patients. However, the medical therapy needs to be continued for several months for better improvement [11]. The radioactive iodine (I131) therapy is successful in 85–90% of graves cases [12]. Although it is extensively usedfor the treatment of toxic MNG, surgery is considered for patients with euthyroid, large, obstructive and toxic MNG [13]. Surgery may vary from lobectomy (solitary toxic nodule) to subtotal, near-total or total thyroidectomy (toxic MNG or grave's disease). The total thyroidectomy is strongly recommended for toxic MNG as it is rapid, reliable, removes any coexisting malignancy and requires no-retreatment [14]. The patients with goiter should undergo TSH measurement and ultrasound of the neck to find out the functional status of the thyroid and any suspicious nodule for carcinoma and FNAC needs to be done from the suspicious nodule [15].

Here, in this case report, we presented a patient with huge goiter, which was compressing the trachea and was causing supraglottic edema and dyspnea. Although she was a known his thyroid function test was normal. Because of huge goiter and supraglottic edema intubation was very difficult and because of midline neck swelling, tracheostomy was not possible and hence bronchoscopic intubation was done.

Total thyroidectomy was done without a nerve monitor, althoughbilateral RLN was identified and preserved intraoperatively . Incidences of RLN paresis (5.8%) and paralysis (1–2%) have been reported in the literature [16,17]. If there are unilateral RLN paraesis, the patient should be observed for 6–12 months before advocating any definitive treatment [18], because, the spontaneously favourable outcome may occur in that period. Even though bilateral inferior parathyroid glands were identified and preserved,Temporary hypoparathyroidism is usually seen in 8–10% of the population postoperatively [19]. Intraoperatively enlarged pyramidal lobe was seen entering into pre-epiglottic space but there was no breach in the laryngeal or pharyngeal mucosa. Studies show that 12% of the patients have pyramidal lobe [20]. The supraglottic edema subsided on the next day of surgery may be because of relieving pressure due to pyramidal lobe excision or due to use of steroids intraoperatively and postoperatively or because of both. MNG is most effectively treated by total thyroidectomy, which achieves complete diminution from symptoms (Fig. 4).

Fig. 4 : Shows a postoperative clinical picture

4. CONCLUSION

Surgery for huge goiter is challenging and one should be careful about difficult intubation, altered anatomy, supraglottic edema and adhesions to the surrounding structures. A pyramidal lobe may be present and may enter into pre-epiglottic space.

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Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Author's contribution : SA has written the manuscript and reported the case. SPS designed the case report. RR and KKR are the surgeons and supervised. All the authors contributed to designing the study, writing approved the final manuscript.

Registration of research studies : NA.

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