Research Article

A Comparative Study between Total and modified Subtotal Thyroidectomy for the Management of Graves' Disease

Adel M. Khalaf, Abd Elkarim E. Abd Elkarim, and Ahmed F. Mehanny
Department of General Surgery, Faculty of Medicine Al-Azhar University – Assuit

Abstract
Background: Grave's disease is an autoimmune disease caused by thyroid receptor antibodies that activate the thyrotrophin receptor, leading to stimulation of cyclic adenosine monophosphate synthesis and production of thyroid hormones in the follicular cells. The prevelance of GD is 0.5% of the population and is the underlying aetiology for 50-80% of cases of hyperthyroidism. **Objective:** To compare total vs modified subtotal thyroidectomy in the management of Graves' disease as regards control of the disease, incidence of recurrence and postoperative complications. **Patients and Methods:** Our study was conducted on 40 patients suffering from GD that had been recruited from the out-patient clinic of surgical department of Al-Azhar Assuit University Hospital. 20 cases have total thyroidectomy and the other 20 have had modified subtotal thyroidectomy. Inclusion criteria was the age from 20 to 60 years (males or females) and failed medical treatment for 6 months. Patients excluded were those less than 20 years old, exophthalmous, chronic debilitating disease, malignancy, and any patient with preoperative vocal cord affection. **Results:** The range of pre-operative thyroid profile shows T3 level 9.4+/-2, T4 level 6.1+/-2 while TSH level 0.08+/-0.02 in total thyroidectomy group and T3 level 8.9+/-2, T4 level 5.5+/-21.6 while TSH level 0.09+/-0.01in modified subtotal group. This study showed no significant changes in both groups as regards postoperative hospital stay. In our study showed that hyocalcemia is the most common immediate post operative complication.
Keywords: Thyroid peroxidase, thyroglobulin

Introduction
Graves' disease is the most frequent cause of hyperthyroidism. It is an autoimmune condition caused by thyroid stimulating antibodies that bind to the thyroid stimulating hormone receptors on thyroid follicular cells. It is most commonly presents in the second to fourth decade, and is more common in women. It is characterized by symmetric diffuse goiter and hyperthyroidism[(1)].

In addition to the typical clinical findings of thyrotoxicosis, patients with Graves ' disease usually exhibit a diffuse, non-tender, symmetrical goiter, Ophthalamopathy apparent in 30% of patients, Dermatopathy, Acropathy with clubbing of the fingers and toes, and frequently have detectable serum antibodies to thyroid peroxidase (TPO) and less commonly to thyroglobulin (TG)[(2)].

Currently, 3 different treatment are commonly adopted for graves' hyperthyroidism: medically, with antithyroid drugs, radioactive iodine, and surgical treatment[(3)].

One of the advantages of radioablation is that it is relatively inexpensive and safer for debilitated patients, who may be poor surgical candidates. Its major disadvantage is that it can take 4–6 months to achieve euthyroidism[(3)].

Anti- thyroid drugs are generally well tolerated, but they have a latent period of 2–6 weeks before symptom relief and they must be given over an extended period of time, around 1–2 years, to achieve long-term remission. Recurrence of hyperthyroidism may be as high as 69% after 6 months of therapy. Furthermore, long-term remission with antithyroid drug therapy is unlikely in patients with large goiters and those with severe hyperthyroidism[(4)].

Aim of the Work
This study is conducted to compare total vs modified subtotal thyroidectomy in the manag-

ement of Graves' disease as regards control of the disease, incidence of recurrence and postoperative complications.

Patients and Methods

Patients:

This is a prospective study which included 40 patients with primary thyrotoxicosis (Graves' disease) and was conducted in Al-Azhar university hospital in Assuit in the period from December 2017 to June 2018.

The Graves 'disease was diagnosed on the basis of clinical symptoms and signs, serum level of thyroid hormones and thyroid stimulating hormones, neck ultrasound.

The patients were divided into two groups on randomized basis by closed envelope technique: **The first group (group A)**: This group included 20 patients with Graves' disease who underwent total thyroidectomy. **The second group (group B)**: This group included 20 patients with Graves' disease who underwent modified subtotal thyroidectomy. **The clinical symptoms, signs and investigations** of Grave's disease were recorded.

Inclusion criteria: Age from 20 to 60 years (males or females). Failed medical treatment for 6 months. Patient preference. Huge goiter.

Exclusion criteria: Patients less than 20 and more than 60 years old. Chronic debilitating disease (liver cell failure, chronic renal failure). Any type of malignancy. Elevated serum anti-thyroglobulin, anti-microsomal antibodies indicating autoimmune thyroiditis. Any patient with preoperative affection of vocal cord mobility. Any patient with preoperative low serum calcium level. Exophthalmous.

All surgeries were done by me under super-vision of a consultant expert in neck surgery.

Results

Table (1): Comparison between both groups as regarding general data.

Variables	(Group A) N=20	(Group B) N=20	T	P
Marital state			2.5	0.34NS
Single	8(40%)	13(65%)		
Married	12(60%)	7(35%)		
Gender			0.1	0.50NS
Male	9(45%)	10(50%)		
Female	11(55%)	10(50%)		
Age	29.3+4	28.6+3.6	0.30	0.75NS

NS: Non significant

Table (2): Comparison between both studied groups as regard symptoms.

Variables	Group (A) N=20	Group(B) N=20	P
Neck swelling	6(30%)	8(40%)	0.37NS
Loss of weight	20(100%)	20(100%)	-
Tremors	5(25%)	5(25%)	-
Palpitations	19(95%)	19(85%)	-
Heart failure	1(5%)	0	0.50NS

Table (3): Comparison between both studied groups as regards preoperative investigations.

Variables	Group A N=20	Group B N=20	T	P
Free T3	9.4+2	8.9±2	0.80NS	0.34NS
Free T4	6.1+2	5.5+1.6	1.5	0.21NS
TSH	0.08±0.02	0.09±0.01	0.60NS	0.87NS
Ant thyroglobulin	0	0	-	
Ant microsomal Abs	0	0	-	
RIS (increased uptake)	20(100%)	20(100%)	-	

Table (4): Comparison between both studied groups as regard operative time

Variables	Group A N=20	Group N=20	T	P
Mean+SD	125 ± 15	117 ± 21	0.5	0.80NS
Range	110-150	100 – 140		

This table shows no statistically significant difference by using unpaired t-test.

Discussion

Graves' disease is not an uncommon disease. Graves' disease may produce a wide range of clinical symptoms, ranging from only minimal clinical discomfort to hazardous, dangerous loss of sight[(12)]**.** In recent years many retrospective studies have compared the effect of endocrine drugs, radioactive iodine, and thyroid surgery; more favorable results were seen after surgery than after radioactive iodine treatment[(13)]**.**

Previous studies have shown that subtotal thyroidectomy is a safe and effective treatment for Grave's disease[(14)]**.** However, there are still substantial debates regarding the size of resection and the option of operation modalities. Associated with a lower risk of developping recurrence of disease, total thyroiddectomy has become the first-line treatment option for patients with Graves' disease in developed countries[(15)]**.**

In the present study compared total thyroidectomy versus modified subtotal thyroid resection to determine if control of Graves' symptoms parallels the hazards of the thyroid surgery.

The study done by Urmas Lepner et al., showed that the incidence of Graves' disease was 41 women (83.7%) and 8 men (16.3%), with a mean age of 42.4±15.2 years compared to the present study which included 40 patients 21 females (55%) and 19 males (45%) with mean age 29.9 years old which was younger than study done by[(16)]**.**

In the present study the indication of surgery was failure of medical treatment (40%) and patient preference was (30%) and huge goiter (30%). The thyroid profile shows T3 level 9.4+/-2, T4 level 6.1+/-2 while TSH level 0.08+/-0.02 in total thyroidectomy group and T3 level 8.9+/-2, T4 level 5.5+/-21.6 while TSH level 0.09+/-0.01in modified subtotal group comparable to Liu et al., the most common reason for thyroid surgery was persistent disease despite medical therapy (46.6%). Patient preference was a major factor in 24.1% of the cases. Other reasons for surgery included patients having large goiter (20.3%), failed radioactive iodine treatment (16%).The mean baseline preoperative TSH and free T4 values were 0.13±0.38 mU/L and 7.7±8.2 mcg/dL, respectively [(17)]**.**

In the current study the mean time required for total thyroidectomy was 125 minutes (range 110-150min). While the mean time required for subtotal thyroidectomy was 117 minutes (range 100-140). This was shorter than the average

operative time in Liu et al., which was 145±5 minutes in total thyroidectomy[17].

According to study done by Zhang overall rates of haematoma and other wound complications related to surgery were low. Postoperative haematoma requiring drainage or return to the theatre was in the range of 0.5% to 3%, and seroma rates were 3% to 4.7%.[18]. This was comparable from the results of the current study which was (5%) seroma with no postoperative hematoma that required return to theatre.

Interestingly, another study by Ku et al., has reported similar findings in patients who underwent a total vs. subtotal (100.6±268 vs. 202.1±489.4 mL) resection. The higher blood loss in a subtotal resection is likely due to bleeding from the cut surface of a highly vascular thyroid gland[19]. This was different from results of the current study where bleeding occurred intra-operatively in one patient (5%) in group A (5%), and 3 in group B (15%) and was safely controlled.

Conclusion

Surgery remains the choice in treatment of Graves' disease. Modified Subtotal thyroidctomy (A new surgical technique by leaving unilateral remnant of thyroid tissue based on the upper pole) generally satisfactory in most cases and known for its lower complications than total thyroidectomy especially in postoperative hypocalcemia. But as a result of this study the complications are almost the same.

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