Bilateral Subtotal Thyroidectomy Versus Unilateral Total and Contralateral Subtotal Thyroidectomy for the Treatment of Hyperthyroidism

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Abstract

Objective: This work aimed to compare the safety and efficacy of unilateral total and contralateral subtotal thyroidectomy versus bilateral subtotal thyroidectomy for the treatment of hyperthyroidism.

Patients and Methods: 30 Patients suffering from hyperthyroidism i.e., Grave's disease or Toxic nodular goiter, were divided to two groups:
• 15 Patients were managed by unilateral total and contralateral subtotal thyroidectomy. (Near total thyroidectomy).
• 15 Patients were managed by bilateral subtotal thyroidectomy.

Both Groups were assessed pre and post operatively to compare the incidence of complications regarding RLNI, parathyroid gland injury and postoperative need for T4 replacement.

Results: No significant difference in the incidence of complication between both groups i.e. Unilateral total and contralateral subtotal thyroidectomy versus bilateral subtotal thyroidectomy.

Conclusion: Near total thyroidectomy can be used effectively and with the same incidence of complication as subtotal thyroidectomy with logical lower incidence of recurrence.

Key Words: Near total thyroidectomy – Subtotal thyroidectomy – Toxic multinodular goiter – Grave's disease.

Introduction

GRAVES' disease is the commonest cause of hyperthyroidism in the United Kingdom [1], this is an autoimmune disorder typically affecting females in the first four decades of life.

The next most common cause of hyperthyroidism is toxic nodular hyperthyroidism. Toxic nodular hyperthyroidism, in contrast to Graves' hyperthyroidism, typically affects females of 60 years or over and there is often a preceding history of long-standing nodular goiter [1]. Three treatment options exist for the management of Graves' or toxic nodular hyperthyroidism:

Medical therapy with a thionamide drug, radioiodine, or surgery. Each of these treatments has advantages and disadvantages and none can be guaranteed to result in permanent euthyroidism.

In diffuse toxic goitre and toxic nodular goitre with overactive internodular tissue, surgery cures by reducing the mass of overactive tissue. Cure is probable if the thyroid tissue can be reduced below a critical mass. This may result in a reduction of TsAb or it may be that circulating TsAb, however its high level, can only produce limited hypertrophy and hyperplasia when the mass of thyroid tissue is small. In the autonomous toxic nodule, and in toxic nodular goitre, surgery cures by removing all of the overactive thyroid tissue. In North America, surgery is recommended when RAI is contraindicated as in patients who (a) have confirmed cancer or suspicious thyroid nodules, (b) are young, (c) are pregnant or desire to conceive soon after treatment, (d) have had severe reactions to antithyroid medications, (e) have large goiters causing compressive symptoms, and (f) are reluctant to undergo RAI therapy [1]. Relative indications for thyroidectomy include patients, particularly smokers, with moderate to severe Graves' ophthalmopathy, those desiring rapid control of hyperthyroidism with a chance of being euthyroid, and those demonstrating poor compliance to antithyroid medications. The goal of thyroidectomy for Graves' disease should be the complete and permanent control of the disease with minimal morbidity. Patients should be rendered euthyroid before operation with antithyroid drugs that should be continued up to the day of surgery. Lugol's iodide
solution or saturated potassium iodide generally is administered beginning 7 to 10 days preoperatively (three drops twice daily) to reduce vascularity of the gland and decrease the risk of precipitating thyroid storm. The major action of iodine in this situation is to inhibit release of thyroid hormone [1].

The extent of thyroidectomy to be performed is controversial and is determined by the desired outcome (risk of recurrence vs. euthyroidism) and surgeon experience. Patients with coexistent thyroid cancer, and those who refuse RAI therapy or have severe ophthalmopathy or have life-threatening reactions to antithyroid medications (vasculitis, agranulocytosis, or liver failure) should undergo total or near-total thyroidectomy. Ophthalmopathy has been demonstrated to stabilize or improve in most patients after total thyroidectomy, presumably from removal of the antigenic stimulus. A subtotal thyroidectomy, leaving a 4- to 7-g remnant, is recommended for all remaining patients. Remnants <3g are recommended for children. Remnants <4 g are associated with a 2 to 10% recurrence rate but a high (>40%) rate of hypothyroidism. During subtotal thyroidectomy, remnant tissue may be left on each side (bilateral subtotal thyroidectomy), or a total lobectomy can be performed on one side with a subtotal thyroidectomy on the other side (Hartley-Dunhill procedure). Results are similar with either procedure, but the latter procedure is theoretically associated with fewer complications and requires re-entering only one side of the neck should recurrence require reoperation. Most studies, however, show no difference in the rates of complications with either approach. Recurrent thyrotoxicosis usually is managed by radioiodine treatment. Long-term follow-up should be maintained for all patients undergoing subtotal procedures, with clinical review and yearly TSH measurement to detect the possible late onset of hypothyroidism or recurrent hyperthyroidism.

Patients and Methods

This study was conducted on 30 patients with hyperthyroidism (patients with Grave’s disease indicated for surgery and patients with toxic nodular goiter) presented to Kasr El-Ainy Hospital, Department 28 A. From June 2008-June 2009.

Patients were divided into two groups:
1- Group A, including 15 patients, managed by total lobectomy on one side and subtotal thyroidectomy on the contra lateral side.
2- Group B, managed by bilateral subtotal thyroidectomy.

The aim of this study is to compare the safety and efficacy of unilateral total and contra lateral subtotal thyroidectomy versus bilateral subtotal thyroidectomy for the treatment of hyperthyroidism.

All patients had been subjected to the following:
1- Preoperative work up:
  • Clinical examination.
  • Routine laboratory investigations assessing patients’ fitness for surgery including:
    a- Liver functions.
    b- Kidney functions.
    c- Complete blood count (C.B.C).
    d- Fasting blood sugar (FBS).
    e- Prothrombin time and concentration (PT and PC).
    f- Total Ca level.
  • Thyroid function tests:
    o Free T3 and T4.
    o TSH.
  • Thyroid scan.
  • Vocal cord assessment.
2- During operation the following were assessed:
  • Operative time.
  • Amount of blood loss.
  • Intra-operative complications. i.e. parathyroid gland injury and RLNI.
3- Postoperative work up will assess the following:
  • Early postoperative complication as:
    o Bleeding and haematoma formation.
    o Clinical and laboratory evidence of hypocalcaemia.
    o Quality of voice.
    o Period of hospital stay.
    o Occurrence of thyrotoxic crisis.
  • Late post operative complications:
    Parients will be followed-up for a period of 6 months postoperatively in a form of a weekly visit in the first month followed by a visit-every 2 weeks in the second month then a monthly visit assessing the following:
    o Evidence of persistent or recurrent hyperthyroidism.
    o Clinical and laboratory evidence of hypocalcaemia.
    o Recurrent or external laryngeal never injury.
Clinical and laboratory evidence of hypothyroidism.

Wound complications.

**Results**

This study included 30 patients with hyperthyroidism (patients with Grave’s disease indicated for surgery and patients with toxic nodular goiter).

15 (group A) of these patients were managed by total lobectomy on one side and subtotal thyroideectomy on the contra lateral side;

And 15 (group B) patients were managed by bilateral subtotal thyroideectomy.

This work aimed to compare the safety and efficacy of unilateral total and contra lateral subtotal thyroideectomy versus bilateral subtotal thyroideectomy for the treatment of hyperthyroidism.

Comparison of the mean age among both groups under study revealed a range between 21 and 53 years in both groups.

Patients of group (A) had mean age of 31.53 compared to patients of group (B) who had a mean age of 31.20, implying a non significant relation between both groups.

<table>
<thead>
<tr>
<th>Item</th>
<th>Group A</th>
<th>Group B</th>
<th>'t' test</th>
<th>p value</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>31.53</td>
<td>31.20</td>
<td>0.083</td>
<td>0.05&gt;</td>
<td>Not significant</td>
</tr>
<tr>
<td>Range</td>
<td>21-53</td>
<td>21-53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation of clinical data included toxic manifestations, pressure on cervical structures with tracheal deviation, significant cosmetic deformity, or intra thoracic extension of multi nodular goiter.

In group A who were managed by total lobectomy on one side and subtotal thyroideectomy on the contra lateral side, 53.4% (8 patients) of the patients had toxic multinodular goiter, and 46.6% (7 patients) of the patients had Grave’s disease while in the patients' group B who were managed by bilateral subtotal thyroideectomy, 73.3% (11 patients) of the patients had toxic nodular goiter and 26.7% (4 patients) of the patients had Grave's disease.

Which implies a non significant relation between both groups.

53.4% of patient in group A (8 patients) manifested with neck swelling with pressure symptoms on cervical structure with tracheal deviation before surgery while 46.6% of patients (7 patients) didn't have this presentation. In group B 73.3% of patients (11 patients) manifested with neck swelling with pressure symptoms on cervical structures with tracheal deviation before surgery while 26.7% of patients (4 patients) didn't have that presentation, which implies a non significant relation between both groups.
40% (6 patients) of patients of group A presented with toxic orbitopathy and eye signs, compared to 20% (3 patients) of patients of group B, comprising a non significant relation.

0% (no patients) of group A presented with toxic dermatopathy, compared to 6.7% (1 patient) of group B, comprising a non significant relation.

53.4% (8 patients) of group A presented with cosmetic deformity before surgery compared to 73.3 (11 patients) of group B, comprising a non significant relation.

Intraoperative assessment of both surgical modalities was done and data are shown in Table (3).

<table>
<thead>
<tr>
<th>Item</th>
<th>Group A</th>
<th>Group B</th>
<th>Chi²</th>
<th>P value</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intraoperative time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average time</td>
<td>4</td>
<td>26.7</td>
<td>7</td>
<td>46.6</td>
<td>Not significant</td>
</tr>
<tr>
<td>Longer time</td>
<td>11</td>
<td>73.3</td>
<td>8</td>
<td>53.4</td>
<td>1.29 0.05 &gt;</td>
</tr>
<tr>
<td>More blood loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00 0.05 &gt; significant</td>
</tr>
<tr>
<td>Intraoperative RLNI or PT injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00 0.05 &gt; significant</td>
</tr>
</tbody>
</table>

73.3% (11 patients) of group A who were managed by total lobectomy on one side and subtotal thyroidectomy on the contra lateral side required longer operative time (120min. ± 15), and 26.7% (4 patients) of group A didn't require longer operative time (100min. ± 10). In comparison to 53.4% (8 patients) of group B who were managed by bilateral subtotal thyroidectomy who required longer operative time (110min. ± 12), and 46.6% (7 patients) of group B didn't require longer operative time (90min. ± 10), comprising a non significant relation.
No patients (0%) in both groups had a significant intraoperative blood loss, implying a non significant relation.

Early postoperative follow-up revealed no evidence of postoperative bleeding or haematoma in both groups. Quality of voice was affected in 2 patients (12.14%) in group A in a form of hoarseness and in one patient (6.7%) in group B also with hoarseness.

One patient (6.7%) in group A had symptoms of hypocalcaemia in early postoperative period in a form of carpopedal spasm and laboratory evidence of hypocalcaemia, which was managed by I.V. Calcium gluconate and subsequently with oral calcium for two weeks and was completely free of symptoms inspite of discontinuation of oral calcium. 14 patients of group A (93.3) were free of these symptoms and all patients of group B did not complain of these symptoms.

Early post operative complications data of both groups under study are shown in Table (4).

<table>
<thead>
<tr>
<th>Item</th>
<th>Group A</th>
<th>Group B</th>
<th>Chi²</th>
<th>P value</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bleeding &amp; hematoma formation:</strong></td>
<td></td>
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<tr>
<td>No</td>
<td>15</td>
<td>15</td>
<td>0.00</td>
<td>0.05&gt;</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hypocalcaemia:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>15</td>
<td>0.00</td>
<td>0.05&gt;</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of voice Not affected</td>
<td>13</td>
<td>14</td>
<td>93.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affected</td>
<td>2</td>
<td>13.4</td>
<td>6.7</td>
<td>1.03</td>
<td>0.05&gt; Not significant</td>
</tr>
<tr>
<td>Period of hospital stay 2 days</td>
<td>13</td>
<td>86.6</td>
<td>14</td>
<td>93.3</td>
<td></td>
</tr>
<tr>
<td>More than 2 days</td>
<td>2</td>
<td>13.4</td>
<td>6.7</td>
<td>1.03</td>
<td>0.05&gt; Not significant</td>
</tr>
<tr>
<td><strong>Thyrotoxic crisis:</strong></td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>15</td>
<td>15</td>
<td>0.00</td>
<td>0.05&gt;</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

Late post operative data of both groups under study is shown in Table (5).

<table>
<thead>
<tr>
<th>Item</th>
<th>Group A</th>
<th>Group B</th>
<th>Chi²</th>
<th>P value</th>
<th>Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypocalcaemia:</strong></td>
<td></td>
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<tr>
<td>No</td>
<td>15</td>
<td>15</td>
<td>0.00</td>
<td>0.05&gt;</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
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<tr>
<td><strong>RLNI:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>86.6</td>
<td>14</td>
<td>93.3</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>13.4</td>
<td>6.7</td>
<td>1.03</td>
<td>0.05&gt; Not significant</td>
</tr>
<tr>
<td><strong>Wound complication:</strong></td>
<td></td>
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</tr>
<tr>
<td>No</td>
<td>15</td>
<td>15</td>
<td>100</td>
<td></td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T4 requirement:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>26.7</td>
<td>8</td>
<td>53.4</td>
<td>Not significant</td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
<td>73.3</td>
<td>7</td>
<td>46.6</td>
<td>1.29 0.05&gt; significant</td>
</tr>
<tr>
<td><strong>T4 level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not elevated</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
<td>Not significant</td>
</tr>
<tr>
<td>Elevated</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>0.05&gt; significant</td>
</tr>
<tr>
<td><strong>TSH level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Normal</td>
<td>4</td>
<td>26.7</td>
<td>8</td>
<td>53.4</td>
<td>1.29 0.05&gt; significant</td>
</tr>
</tbody>
</table>
0% (0 patients) of group A who were managed by total lobectomy on one side and subtotal thyroidectomy on the contra lateral side suffered any clinical or laboratory evidence of hypocalcaemia, and 0% (0 patients) of group B who were managed by bilateral subtotal thyroidectomy suffered any clinical or laboratory evidence of hypocalcaemia, comprising a non significant relation.

T4 replacement, and 26.7% (4 patients) of group A didn't require T4 supplementation. In comparison to 46.6% (7 patients) of group B who were managed by bilateral subtotal thyroidectomy who required T4 replacement and 53.4% (8 patients) of group B didn't require T4 supplementation. Comprising a non significant relation.

13.4% (2 patients) of group A who were managed by total lobectomy on one side and subtotal thyroidectomy on the contra lateral side were complicated by RLNI. In comparison to 6.7% (1 patient) of group B who were managed by bilateral subtotal thyroidectomy, comprising a non significant relation.

Fig. (9) shows a column chart presenting a comparison between both groups according to RLNI.

73.3% (11 patients) of group A who were managed by total lobectomy on one side and subtotal thyroidectomy on the contra lateral side required T4 replacement, and 26.7% (4 patients) of group A didn't require T4 supplementation. In comparison to 46.6% (7 patients) of group B who were managed by bilateral subtotal thyroidectomy who required T4 replacement and 53.4% (8 patients) of group B didn't require T4 supplementation. Comprising a non significant relation.

No patients in either groups suffered wound complications implying a non significant relation.

73.3% (11 patients) of group A who were managed by total lobectomy on one side and subtotal thyroidectomy on the contra lateral side required
Discussion

Extent of thyroidectomy in benign thyroid disease is still a matter of debate and shows a large spectrum of management strategies from nodulectomy to total thyroidectomy. The aim of all these procedures is to perform the most effective treatment with the less complication.

In the beginning of the last century Sir Thomas P. Dunhill (1876-1957) defined the Dunhill Procedure for toxic goiter diseases. He removed one lobe, isthmus and one half to two thirds of the contra lateral lobe [2].

The term DP was used for treatment of Graves’ disease by some authors in literature [3,4].

Some authors use total thyroidectomy on one side and subtotal thyroidectomy on the other side for benign thyroid diseases such as in Graves’ disease and in nodular goiter [5,6].

Arguments against such a strategy are based on the perceived fear of excessive morbidity, particularly damage to the recurrent laryngeal nerves and parathyroid glands and supplementation of patients with thyroid hormone throughout their life [7].

It was also supposed that autonomous euthyroid status without L-thyroxin supplementation can be easily achieved after subtotal thyroidectomy. Some surgeons suggest that morbidity of non-total operations is lower than total thyroidectomy [5,6].

Therefore, generally they prefer bilateral subtotal operation for benign disease.

This work aimed to compare the safety and efficacy of unilateral total and contra lateral subtotal thyroidectomy versus bilateral subtotal thyroidectomy for treatment of thyrotoxicosis.

Our study comprised 30 patients with hyperthyroidism (patients with Grave’s disease and toxic nodular goiter) presented to Kasr El-Aini Hospital, department 28 A during the time period of the study (one year).

Those patients were presented to us suffering from thyrotoxic manifestations.

We divided those patients into two groups:
• Group A: 15 patients who were managed by unilateral total and contra lateral subtotal thyroidectomy.
• Group B: 15 patients who were managed by bilateral subtotal thyroidectomy.

As we see in this study all patients were examined before subjecting them to surgical treatment, and no significant differences were found between both groups; the range of age in both groups was of no significance, also evaluation of clinical data included toxic manifestations, pressure on cervical structure with tracheal deviation, significant cosmetic deformity, or intra thoracic extension of multi nodular goiter did not show significant difference between both groups who were studied.

In group A, those who were managed by total lobectomy on one side and subtotal thyroidectomy on the contra latera l side 53.4% (8 patients) of the patients had toxic multinodular goiter, and 46.6% (7 patients) of the patients had Grave’s disease while in the group B who were managed by bilateral subtotal thyroidectomy, 73.3% (11 patients) of the patients had toxic nodular goiter and 26.7% (4 patients) of the patients had Grave’s disease. Which implies a non significant relation between both groups.

By evaluating the two surgical modalities intra operatively there were no significant difference between both groups i.e. total lobectomy on one side and subtotal thyroidectomy on the contra lateral side versus bilateral subtotal thyroidectomy, as no significant increase in the operative time, intra operative bleeding or intra operative complication (e.g. Intra operative injury of Recurrent laryngeal nerve or intra operative injury of parathyroid gland).

Post operative follow-up of each group to compare both surgical modalities did not reveal any significant relation regarding bleeding or hematoma formation in the early post operative time, clinical or laboratory evidence of hypocalcaemia in the early or late post operative time.

RLNI which was temporary and complete recovery was achieved within 1 month as detected in 2 patients (13.4%) of group A, in comparison to 1 patient (6.7%) of group B, comprising a non significant relation. This transient change in voice quality is probably due to neurapraxia from surgical trauma or transient ischemia as there was no gross evidence of nerve injury intra-operatively.

The most important factor in preventing morbidity after thyroidectomy is an appropriate surgical technique. In this way, identification of both the parathyroid glands and recurrent laryngeal nerves during operation is considered the most valid method to prevent injury. Since we routinely identify the recurrent nerve during operation, we did not observe any permanent nerve palsy in any of
the two groups. We also tried to preserve the blood supply to the parathyroid glands. We also did not observe any permanent hypoparathyroidism in our patients.

11 patients (73.3%) from group A required L-thyroxine supplementation in comparison to 7 patients (46.6%) from group B who required supplementation, comprising a non significant statistical difference.

Although we concede that our observation period is too short to talk about recurrence development, we can at least say that we did not observe any recurrence during this short follow-up period. Since the remnant tissue in total lobectomy on one side and subtotal thyroidectomy on the contralateral side is approximately half of the bilateral subtotal thyroidectomy technique, we expected a lesser recurrence ratio in group A in comparison to group B.

Tschantz, et al., emphasized that the recurrence rate is lower in patients with benign thyroidal diseases who had undergone total lobectomy on one side and subtotal thyroidectomy on the contralateral side than patients undergone bilateral subtotal thyroidectomy without a difference in complication development [6].

In our follow-up period we did not see any recurrence, but in the long-term follow-up of our patients we may expect our prediction to come true.

When secondary operation is needed, unilateral exploration is enough for patients who undergone total lobectomy on one side and subtotal thyroidectomy on the contralateral side and this may be seen as an advantage to this procedure and it also provides an opportunity for unilateral intervention in a safe and easy way when secondary operation is required.

Near total thyroidectomy (NTT) for benign thyroid disease can reduce the need for reoperation for nodular goiter and hyperthyroidism, a low complication rate can be achieved with meticulous surgical technique, near total thyroidectomy can be done safely for bilateral benign thyroid disease [8].

Ozbas S, et al., stated in a study for comparison of the complications of subtotal, near total and total thyroidectomy in the surgical management of multinodular goiter that permanent complication rates were similar for all three surgeries, and so given the recurrence associated with the bilateral subtotal thyroidectomy, the near total thyroidectomy or total thyroidectomy may be the operation of choice for multinodular goiter [9].

Dunhill procedure is the treatment of choice for multinodular goiter and for Grave's disease because it decrease the likelihood of future repeat operations for recurrent disease and thus operation for recurrent disease and thus associated risks, when performed safely [10].

Near-total thyroidectomy achieves a lower complication rate of hypoparathyroidism and a similar complication rate of recurrent laryngeal nerve palsy and recurrence when compared with the rates reported in the literature for total thyroidectomy. It is an effective and safe surgical treatment option for various benign thyroid diseases [11].

Subtotal thyroidectomy is a technique that should be abandoned owing to the fact that its complications rate is comparable to that of near total thyroidectomy and to the recurrences it may give Rice to. Subtotal thyroidectomy may be indicated if the surgeon is not sure of safeguarding the anatomical integrity of the recurrent nerve on one side [12].

Bron and O’Brien, reported that near total thyroidectomy has an important role in benign disease of thyroid. This approach reduce the recurrence and the risk of morbidity associated with secondary operation [12].

Subtotal thyroidectomy provide an unpredictable outcome and the risk of permanent complication is not greater than near total thyroidectomy, there appear little logical reasons to continue to recommend subtotal thyroidectomy for surgical management of Grave’s disease [13].

Topliss and Eastman, stated that the high rate of relapse after subtotal thyroidectomy has led many surgeons to recommend near total thyroidectomy [14].

Kurihara, concluded that near total thyroidectomy can be performed as safely as subtotal thyroidectomy and is more effective for Grave’s ophthalmopathy than subtotal thyroidectomy. However this procedure is not expected to completely inactive aggressive ophthalmopathy. In severe cases orbital decompression, corrective eye muscle, and lid surgery are necessary [15].

Miccoli, et al., stated that near total thyroidectomy does not represent more complications with respect to subtotal thyroidectomy, but it decreases
the incidence of thyroid hormonal autoimmunity and the relapse of hyperthyroidism. Thus it could represent the treatment of choice in Grave’s disease [16].

Hermann, et al., proposed that the therapeutic goal in thyroid operation is to avoid recurrent hyperthyroidism. This is not reliably achieved by subtotal thyroidectomy. In contrast near total and total thyroidectomy are effective and safe [17].

So our final conclusion is that, near total thyroidectomy (unilateral lobectomy and contralateral subtotal thyroidectomy) can be used effectively and with the same incidence of complication as subtotal thyroidectomy for treatment of toxic goiter with logical lower incidence of recurrence.

References
11- ACUN Z., COMERT M., CIHAN A., ULUKENT S.C., UCAN B. and CAKMAK G.K.: Near-total thyroidectomy could be the best treatment for thyroid disease in endemic regions. General Surgery Department, School of Medicine, Zonguldak Karaelmas University, Zonguldak, Turkey, 2004.