Original article:

Treatment outcome of thyroidectomies performed under local anesthesia for nodular goiter patients attending at Banadir Hospital in Mogadishu Somalia

Mohamed Abdi Shire Olow¹, Recep Erçin Sönmez², Mohamed Yusuf Hassan¹, Abdurrahman Osman Fıqı¹, Orhan Alimoğlu²

Abstract:

Background: Thyroidectomy; which involves the removal of total or part of the thyroid glandis a routinely performed surgery that may have perioperative risks and complications which can be life-threatening. Objective: Main objective of this study is to determine the incidence of postthyroidectomy complications at Banadir Hospital, and to put forward the clinical benefits of those which had been performed under local anesthesia. Materials and Methods: Present study; which is prospective in nature, was conducted on 25 patients between 18 and 70 years of age who were scheduled to undergo elective thyroidectomy beginning from May to July, 2017. Blood samples for calcium, albumin, thyroid hormone levels were collected pre-operatively; within 48 hours and 5 days post-operatively. Relevant data had been achieved from the medical achieve of the department. Results: Patients between 20 and 40 years of age occupied the highest percentage of population in the study. Two (8%) patients had records of previous thyroid surgery. Ultrasonographic (USG) evaluations revealed benign thyroid nodule for 23 (92%) patients, as 2 (8%) other patients were confirmed as malignancy on their fine needle aspiration cytology (FNAC) which had suspicious findings on ultrasonographic (USG) evaluations. 21 (84%) patients had pain as the chief complaint. 19(76%) patient operations had been performed under local anesthesia, while 6(24%) patients had undergone operations undergeneral anesthesia. Total thyroidectomy was performed for 10 (40%) patients, whereas the rest (n=15 (60%) were performed with subtotal, near total and partial (lobectomy, nodulectomy) resections. No permanent hypocalcemia was recorded during the postoperative period, though 2 (8%) patients had transient hoarseness due to laryngeal nerve injury and another 2 (8%) patients had findings of surgical site infections. Conclusion: Thyroidectomy procedure could end up with undesired outcomes like nerve paralysis or hypocalcemia even at most experienced hands. Considering that, definite and precise operation should be performed at once to prevent re-operations that could increase the rate of morbidity.

Keywords: Thyroidectomy, local anesthesia, nodular goiter, outcome.

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Introduction

Thyroid gland is a homogenous endocrine organ though different forms of nodules may grow in it. These nodules are mostly composed of localized colloid-filled follicles, adenomas, or cysts. Nodules larger than 1 cm can easily be detected clinically by an experienced surgeon. Although, majority of these nodules are those which are less than 1 cm, and mostly are located within the deep tissue.¹⁻³

The incidence of goiter is strongly correlated on the status of iodine intake of the population. In areas of iodine deficiency, goiter prevalence may be very high. Related with that, multinodularity develops frequently considering the ones having goiter for a long time. So, the prevalence of multinodular goiter is higher in iodine deficient countries.⁴

Thyroidectomy is one of the major and frequently performed operations in general surgery clinics. Looking back to history, most notablesurgeons relevant with thyroid surgery are Kocher (1841-1917) and Billroth (1829-1894), respectively. Kocher collected data on 268 thyroid operations and identified recurrent laryngeal nerve (RLN) injury, myxoedema and tetany as serious postoperative complications.⁵

- 1. Faculty of Medicine and Surgery, Banadir University, Mogadishu, Somalia
- 2. Department of General Surgery, Faculty of Medicine, Istanbul Medeniyet University, Istanbul, Turkey

<u>Correspondence to:</u> Orhan Alimoğlu, MD, Department of General Surgery, Istanbul Medeniyet University, Kadıköy, Istanbul, Turkey. **E-mail:** orhanalimoglu@gmail.com

According to recent literature, thyroid surgery hinders complication rate between 0.4% and 30%. These could end up with serious clinical sequalae such as hypocalcemia, RLN paralysis and psychological problems that may limit working capacities and also may lead tosocial problems.⁶⁻⁸ Most of the postoperative complications would be avoidable if the surgeon has a profound knowledge of anatomy and respects a meticulous procedure of thyroidectomy. Common sense is that increasing experience contributes to safe surgical procedure and good outcome.

Main objectives of the present study are to put forward the incidence of post-thyroidectomy complications performed for nodular goiter and to discuss the clinical results of those whom were operated under local anesthesia.

Materials and Methods Study Design

The present study, which is prospective in nature was conducted in the general surgery department of Banadir Hospital. Patients who are equal and/ or older than 18 years of age were included in the study. Study population was scheduled to undergo elective thyroidectomy (lobectomy, subtotal/ near total and total or redo-thyroidectomy) due to different forms of nodular goiter. Informed consents were taken from the patients or their guardians for participation in the study.

Data collection

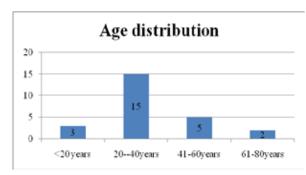
All data was collected from the medical archive of the department. Demographic properties, pre- and postoperative clinical findings were analyzed for future evaluations.

In the statistical models; age, residence, preoperative symptoms, T3, T4, TSH, calcium, albuminlevels, type of anesthesia were accepted as independent variables. Treatment outcomes of thyroidectomy for nodular goiter patients were selected as dependent variables.

Results

Majority of the patient population consisted of those between 20 and 40 years of age (Figure 1). 23 (92%) patients had no record of thyroid surgery, while 2 (8%) patients had previous history of lobectomy. All operations were performed by surgeons who had experience in thyroid surgery for more than 10 years.

Figure 1: Age distribution of respondents



Evaluations by fine needle aspiration cytology (FNAC) had been confirmed as benign thyroid nodule considering 23 (92%) patients, while 2 (8%) patients had been diagnosed with malignant thyroid nodule according to their biopsies which had been performed according to suspicious findings reported on ultrasonographic (USG) evaluations.

Most common complaints of the patients before the operations which had been recorded with a decreasing frequency were, pain (n=22 (88%)), dyspnea (n=2 (8%)), and difficulty during swallowing (n=1 (4%)).

According to pre-operative laboratory assessments, calcium levels of 17 (68%) patients were found within normal limits (norm=2.1-2.6 mmol/L). 5 (20%) patients were evaluated as hypocalcemic (<2.1 mmol/L), while 3 (12%) patients' laboratory findings were revealed as hypercalcemia (>2.6 mmol/L). Laboratory results of low and high calcium levels did not reveal any clinical symptoms, though those abnormal measurements could not be attributed to a specific cause (like parathyroid hyperplasia or adenoma, renal insufficiency, etc.) despite further assessments. Relevant with the issue, pre-operative albumin levels of 21 (84%) patients were within normal limits (norm=3.5-5 g/dl). Pre-operative thyroid hormone assessments had revealed high levels (>5 mIU/L) of TSH (Thyroid Stimulating Hormone) for 6 (24%) patients.

10 patients (40%) underwent total thyroidectomy, while lobectomy was performed for 7 patients (28%), near-total thyroidectomy was performed for 4 patients (16%), 3 patients (12%) had undergone nodulectomy only, and subtotal thyroidectomy had been performed for 1 patient (4%) (Table 1). Of these operations; 19 (76%) of them had been performed under local anesthesia, while 6 (24%) patients' operations had been performed under general anesthesia.

Table 1: Type of thyroid surgery performed

Type of thyriod surgery performed	n	%
Total Thyrodectomy	10	40
Hemithyrodectomy (Lobectomy)	7	28
Near Total Thyrodectomy	4	16
Nodulectomy	3	12
Subtotal Thyrodectomy	1	4
Total	25	100

Chief complaint during the post-operative period was recorded as 'pain' which had been reported for 14 (56%) patients. According to post-operative findings, 3 (12%) patients were recorded to have bleeding on the same post-operative day which had been managed in conservative ways. 3 (12%) patients had complaints of difficulty during swallowing which were attributed to post-operative pain and that had disappeared in all during the following days, while 2 (8%) patients had 'hoarseness' which were attributed to laryngeal nerve injury. Evaluation of wound sites revealed surgical site infections for 2 (8%) patients.

Post-operative calcium level assessments revealed hypocalcemia (<2.1mmol/L) for 17 (68%) patients on the first day of operation. Nonetheless, low levels of calcium clinically had not reflected, as theirs medical treatments had been ordered accordingly and control measurements of all reached normal levels on the consecutive days during the follow-up period.

Discussion

The surgical exposure may be improved by good installation, section of prethyroid muscles and ligation of the middle thyroid veins. Careful and cautious dissection, externalization of the retrosternal part of the gland, and eventually morcellation of the goiter may facilitate the removal of the gland. The surgeon must take care to practice an adequate hemostasis to avoid postoperative hematoma and the injury of the RLN. Visual identification of the RLN has upmost importance during thyroidectomy procedure which needs meticulous dissection to prevent any possible injury. Intra-operative identification of the RLN(s) during thyroidectomy should be made routinely where applicable. The intra-operative findings should always be noted clearly in the patients' operation notes.

Intraoperative nerve monitoring (IONM) is widely

used by surgeons to prevent laryngeal nerve injury. Although, some recent studies claim that use of IONM does not significantly reduce the risk of nerve injury, and especially RLN injuries. 9-11 To avoid RLN injury, Proye et al. put forward the importance of beginningligation at superior pole of the thyroid gland and always working close to the gland during dissection. 12

Present study was conducted on 25 nodular goiter patients of whom the majority of the study population were among female patients (n=23 (92%)). This finding is correlated with relevant literature that women are more likely to develop nodules and more prone to thyroid diseases compared to men. ¹³⁻¹⁵

Among all, total thyroidectomy was the most common operation performed for nodular goiter patients (n=10(40%). 2 patients within this group had developed RLN paralysis. Also, it was found that total thyroidectomy patients had higher rate of hypocalcemia during the follow-up period unlike the ones who had undergone more conservative resections. Though, those patients' control measurements for calcium levels were found to be within normal limits during the consecutive days, total thyroidectomy hinders a higher risk of parathyroid gland injury compared to less invasive approaches like subtotal thyroidectomy or lobectomy.

Radical surgery brings along higher risk complications such as hypocalcemia, hypoparathyroidism, laryngeal nerve injury (RLN, non-recurrent laryngeal nerve and/or superior laryngeal nerve) hematoma. When dealing with benign diseases of thyroid, less radical approaches (lobectomy, near total or subtotal thyroidectomy, etc.) are advocated to prevent undesirable clinicaloutcomes. Patients presenting with hoarseness immediately after thyroidectomy should be followed up for at least six weeks before being concluded to have permanent laryngeal nerve paralysis. Risk of injury is also increased in reoperations which are attributed to altered anatomy and adhesions due to previously performed dissections. These adhesions may be more for the ones that have previous history of operations which had been performed for malignant disease. Another critical finding of this study is that the majority of the operations (n=19 (76%) were performed under local anesthesia. Patients who were undergone operations with local anesthesia had similar operating times and lengths of stay

at the hospital with those who were operated under general anesthesia (n=6 (24%)). As well as preventing possible side effects of general anesthesia, patient comfort was also more satisfactory for the ones who were operated by local anesthesia considering their fast return to daily activities following the operations.

Conclusion

An informed consent, with special attention being given to the risk of injury and subsequent paralysis of the RLNs, should always be obtained before undertaking a thyroidectomy. Pre-operative assessment of RLNs function should be done routinely especially for patients having features of RLN dysfunction before thyroidectomy. Reoperations on the thyroid gland should be avoided at all cost by obtaining the best possible clearance of disease during the primary operation. Depending

on the clinical status of the patient and expertise of the surgeon, operations under local anesthesia may be advocated considering its clinical benefits.

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