Intracapsular Thyroidectomy: Our Experience at a Tertiary Care Hospital.

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ABSTRACT

Background: Goiter is the common endocrine disease encountered in ENT practice. Surgery is one of the main line of treatment. Commonly performed procedures for benign thyroid disease are conventionally performed with extra capsular approach and mandatory identification of the recurrent laryngeal nerve and parathyroid glands. Intracapsular thyroidectomy is the emerging technique and there is an ongoing debate among the clinicians using intracapsular thyroidectomy and its complications especially recurrent laryngeal nerve injury.

Objective: To evaluate the results of intracapsular thyroidectomy in the management of benign thyroid diseases.

Material and Methods: This Cross sectional descriptive study was conducted in ENT Department, Saidu Group of Teaching Hospitals, Saidu Sharif Swat, Khyber Pakhtunkhwa, Pakistan from January 17, 2017 to April 21, 2019. A total of 90 patients of benign thyroid diseases who underwent intracapsular thyroidectomy during the period were included in the study. The data collected through predesigned Proforma was analyzed with SPSS version 22 for results.

Results: Among 90 patients 72 % were female and 28 % were male. The mean age was 38 ± 2 years. Multinodular goiter was 71 %, diffuse nontoxic goiter was 16% and solitary thyroid nodule was 13%. All the goiters were having benign pathology. Total thyroidectomy was performed on 47%, near total thyroidectomy was performed on 36 % and 17% patients underwent hemithyroidectomy. Among the complications transient hypocalcaemia was noted in 3%, temporary voice changes in 2 %, seroma formation and wound infection each in 1% patients while no complications were observed in the majority of cases.

Conclusion: We concluded that Intracapsular thyroidectomy and early division of isthmus and medial to lateral dissection of thyroid gland along the trachea is a safe and effective procedure with low complication rate in benign thyroid disease.

Key words: Benign Thyroid Diseases, Intracapsular Thyroidectomy, Complications

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INTRODUCTION

The pretracheal fascia surrounds and encloses the thyroid gland. This deep cervical fascia also contributes to the capsule of thyroid gland¹. Posteriorly the capsule forms Berry's ligament or also known as posterior suspensory ligament. Recurrent laryngeal nerve and other structures courses through these neck fasciae¹. The thyroid capsule faces the deep layer of superficial fascia covering the strap muscles anterolaterally, postero-medially the carotid sheath and trachea posteriorly¹.

Thyroid gland enlargement is called goiter. It may present as diffuse, nodular or a solitary nodule in a normal background. The goiter is common having an incidence of 5-12% in female and 2-5% in male population². Thyroidectomy is one of the common surgical procedure and carries nearly zero percent mortality in dedicated specialized centers for thyroid gland surgeries³. Complications of thyroidectomy are directly proportional to the extent of surgical resection and the operating skills of the surgeon⁴. The complications are reduced with the surgeon devoting to careful, fine and stepwise dissection. To attain this good

exposure of the anatomic structures, a dry surgical field with comprehensive understanding of anatomy, identification and use of landmarks and familiarity with anatomic variation is needed on part of the operating surgeon. Moreover use of glasses for magnification, cautery, clips or ligatures and nerve monitors for recurrent laryngeal nerve identification has a paramount importance^{5,6}. The use of harmonic scalpel using ultrasonic fractional heating has shown better results in the reduction of operative time up to 20 % and has proved cost effective⁷. Recently thyroidectomy without sutures known as suturless thyroidectomy has been familiarized and tested but the outcomes were not good⁸. Minimally invasive endoscopic thyroidectomy or video endoscopically assisted thyroidectomy is becoming popular among thyroid surgeons as the studies have shown low complication rate but its use is limited to patients with small thyroid nodules⁹.

In an international study conducted in Department of General Surgery, Menoufia University Hospital 50 patients underwent intracapsular thyroidectomy in which seroma as a complication was noted in 4% while no single patient developed recurrent laryngeal nerve palsy¹⁰. In another study similar results for recurrent laryngeal nerve injury has been noted but Symptomatic transient hypocalcaemia occurred in two cases (1.8%). A

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local study conducted at Isra University Hospital, Hyderabad Pakistan in their results has mentioned that postoperative hypocalcaemia was the most frequent complication observed in 3.5% of all patients followed by recurrent laryngeal nerve (RLN) injury noted in 2.8% patients¹¹.

Similarly the RLN injury has been reported to be 5 % by a local study at department of general surgery, Gomal Medical College, D.I.Khan¹². A study conducted in department of general surgery, at Liaquat University of Medical and Health Sciences, Jamshoro has mentioned that RLN identification decreased the nerve injury incidence from 5% to 1.6%¹³.

This study was designed keeping the scarcity of data locally and to assess and review the experience of intracapsular technique in terms of efficacy and effectiveness in the management of benign thyroid disease.

MATERIAL AND METHODS

This study was carried out in the ENT Department Saidu Teaching Hospital Saidu Sharif Swat from January 17, 2017 to April 21, 2019. In this cross sectional study, a total of 90 patients with benign thyroid diseases who have no contraindication for anesthesia or surgery and who underwent intracapsular thyroidectomy were included. Recurrent thyroid surgery, presence of thyroiditis and goiters having retrosternal extension were excluded from the study. Informed written consent was taken from all the included patients. Preoperatively the patients were assessed through history, clinical examination and investigations like Ultrasound Neck, Thyroid function tests, FNAC and baseline investigations for anesthesia and surgery fitness. All the surgeries were performed by the faculty members of the department who were consultants, fellows of college of physicians and surgeons, having a minimum of five years of post-fellowship experience in thyroidectomy. Regarding the surgical technique, all the steps for intracapsular thyroidectomy were the same as for conventional thyroid surgery up to the exposure of the gland and then the gland was divided in the isthmus longitudinally and hemostasis secured. Middle thyroid vein was ligated and after mobilization of the lobe, superior thyroid vessels were ligated inside the capsule of the gland. Dissection was carried out from medial to lateral inside the capsule and the peripheral branches of the inferior thyroid vessels were ligated. An attempt to identify

parathyroid and recurrent laryngeal nerve was only made if there was any suspicion. Suction drains were put in all patients. Vocal cords of all the patient were checked at the time of extubation. Serum calcium analysis was done daily. Patients were discharged 24 to 72 hours depending on the amount of the drainage volume and condition of the patient. The patients were followed on 10th postoperative day initially, monthly for 2 months, 3 monthly for 6 months and then according to the need of the patient. The data was recorded on Performa and SPSS version 22 was used for analysis. Mean $\pm$ SD was calculated for numerical variables like age. Frequencies and percentages were calculated for categorical variables like gender, type of surgery and postoperative complications and data was presented in tables and graphs.

RESULTS

Of the 90 patients, 25 (28%) were male and 65 (72%) were female. The age range was from 28 to 55 years with a mean age 38 ± 2 years. Multinodular Goiter (71%) was main clinical findings in the majority of cases. In this study, Diffuse nontoxic goiter was found in 16% and solitary thyroid nodule in 13 %.

Table No 1 shows the type of surgery performed. Majority of the patients 42 (47%) underwent total thyroidectomy, followed by near total thyroidectomy 33 (36%) and Hemithyroidectomy 15 (17%).

Table No 1. Type of Surgery Performed

Type	No	Percentage
Total Thyroidectomy	42	47%
Near total Thyroidectomy	33	36%
Hemi Thyroidectomy	15	17%

Table No 2 shows the breakdown of complications with transient hypocalcaemia being the most frequent one and wound infection/seroma being the least common among the postoperative complications in these studied patients.

Table No 2. Postoperative Complications

Complication Type	N=90	%
No Complications	83	93%
Transient Hypocalcaemia	3	3%
Temporary Voice Change	2	2%
Seroma	1	1%
Wound Infection	1	1%

Regarding the operative time, hemi thyroidectomy took a mean of 60 minutes while total thyroidectomy and near total thyroidectomy was completed in a mean time of 80 minutes. No mortality was noted during the study and follow up period.

DISCUSSION

Although no surgical operation can be performed without the risk of complications, thyroid surgery in the recent years is generally considered safe due to better preoperative preparations, safer general anesthesia better antisepsis and improved surgical techniques. The major complications of thyroidectomy like excessive bleeding with hematoma formation, injury to recurrent laryngeal nerve and hypoparathyroidism can be kept to a minimum by operating in a bloodless field and a meticulous anatomical dissection¹⁷. The traditional technique of bilateral thyroidectomy in benign thyroid diseases is still the extra capsular approach with its variations and a lot spectrum of complications occur according to the experience of the surgeon¹⁸.

Many studies suggest that the technique of intracapsular thyroidectomy and medial to lateral dissection is a safe method in terms of recurrent laryngeal nerve and parathyroid gland injury as in this technique the capsule is opened and thyroid tissue is enucleated from the capsule leaving these structures under the capsule with intact blood supply. The parathyroid gland also lies beneath the thyroid capsule and the glands along with its intact blood supply are preserved¹⁶. Some recent studies have shown no significant complication regarding recurrent laryngeal nerve and parathyroid gland injury¹⁷. In our study transient hypocalcaemia occurred in 3 (3%) patients. In a study conducted on 224 patients, 112 patients underwent intracapsular total thyroidectomy and 112 patient underwent total thyroidectomy found that by intracapsular method the complications of hypocalcaemia was 0 percent compared 0.9% with extra capsular method and the same observation was also noted in recurrent laryngeal nerve injury¹⁸. The risk of permanent hypothyroidism after any type of procedure is difficult to estimate from the available data but 9 to 10 percent have been reported in different studies after total thyroidectomy¹⁹ and some have reported for large multinodular goiters up to 20 % patients but only 3 percent remained

permanently hypocalcemic²⁰. Temporary voice changes were noted in 2(2%) patients in our study. In some recent studies no patient developed voice changes after total intracapsular thyroidectomy²¹. Different studies have reported recurrent laryngeal nerve injury from 0 to 14 percent¹¹. Post-operative wound infection occurred in 1(1%) patients in our study. This complication is more or less the same as in other national and international literature²¹. The complication is related to the antiseptic precautions during surgery and has no direct relation with the technique of surgery. Similarly other complications like seroma formation, superficial surgical site infection are comparable with other studies but these complications are mainly dependent on surgical expertise, length of surgery, antiseptic precautions nature and extent of thyroid pathology and patient factors²². In our study no patient had post-operative bleeding or hematoma formation. This is one of the grave complication of thyroidectomy and is a life threatening emergency. The reported incidence in the literature ranges from 0 to 5%²³.

In this study the operative time for hemi thyroidectomy was 60 ±15 minutes and for total and near thyroidectomy it was 80 ±15 minutes. This is comparable with other studies who have undergone intracapsular thyroidectomy²⁴. In a German multicenter study total thyroidectomy took an average of 150 minutes²⁵.

CONCLUSION

Intracapsular thyroidectomy with an early dissection of isthmus and medial to lateral dissection for benign thyroid disease is relatively easy technique with low complications rate and less operative time.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan SA, Ihsanullah: Concept and design of study, Collection of data, statistical analysis
Usman M, Inayatullah: Writing of manuscript, critical review of manuscript
Ahmad S: Analysis and interpretation of data, statistical analysis
Ubaid Ullah: Data collection, bibliography

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.