# SURGICAL AUDIT OF 250 CASES OF THYROID SURGERIES

**M. RAFIQUE GOODA*, ZAKIUDDIN G. OONWALA**, M. SALEEM KHAN****
*Department of ENT and Head & Neck Surgery, Hamdard College of Medicine & Dentistry, Karachi**
*Department of Surgery, Hamdard College of Medicine & Dentistry & Hamdard University Hospital, Karachi***

***ABSTRACT***
***Objective:*** *The nature of clinical presentation, surgical pathologies and post-operative complications were assessed in a study of 250 surgeries for thyroid goiter.*
***Study Design:*** *Retrospective study.*
***Setting & Duration:*** *Thyroid surgeries were performed by the same surgical team in five medical centers of urban and rural Karachi, Pakistan. The patients came from diverse ethnic and social strata.*
***Methodology:*** *The study was carried out between Feb 2000 and Feb 2009. 250 patients with goiterous swelling of the thyroid were operated. Out of 250 patients 245(98%) were females. Ultrasound, thyroid scan, T4/TSH and FNA were the main investigations done. Patients underwent extended hemi, sub-total and near-total and total thyroidectomies, and the surgical specimens were submitted for definitive histopathological diagnosis.*
***Results:*** *Of the 250 patients, over a nine year period, 180(72%) had nodular disease and 70(28%) patients had a non-nodular diffuse thyroid enlargement. 212 patients (84.8%) were euthyroid and 38(15.2%) were hyperthyroid. Subtotal Thyroidectomies were performed in 195(77.6%) patients, extended Hemithyroidectomies were performed in 45(18%) patients, near-total resections were performed in 10(04%) patients and total thyroidectomy was performed in one patient. 160 patients were not provided vacuum drainage post operatively. 6(2.4%) patients developed serous collections in the surgical spaces which were aspirated. 1(0.4%) patient developed complete bilateral recurrent laryngeal nerve paralysis, 1 patient (0.4%) developed the loss of the contralateral RLN on performing a completion thyroidectomy when the first was already damaged during surgery done elsewhere. 3 patients (1.2%) developed complete unilateral recurrent nerve paralysis. 6 patients (2.4%) developed transient recurrent nerve paralysis which recovered completely. One (0.4%) patient developed superior nerve paralysis and one patient developed parathyroid insufficiency. Benign thyroid diseases constituted 95.2% of the thyroid enlargement whereas only 12 patients (4.5%) showed evidence of malignancy. None of the patients developed wound infection or cosmetic defects.*
***Conclusion:*** *It was concluded that thyroid malignancy is still not a significant clinical diagnosis in our social scenario. It is possible to reduce post operative nerve complications by strictly adhering to the subplatysmal plane, using coagulation diathermy, staying close to the thyroid capsule and identifying the vessels with precise diathermy prevents nerve damage. Meticulous hemostasis precludes drainage of the operative area and prevents complications.*

***KEYWORDS:*** *Thyroid Surgery, Surgical Audit, Pathology of Thyroid*

## INTRODUCTION

Majority of the patients with goiter present with swelling in front of their neck either localized to one side of the neck or on both sides. These swellings are mostly nodular or show a smooth enlargement of the thyroid gland. All swellings move on swallowing. In some cases a person notices a nodule in his own neck, while in other cases a healthcare provider will feel a nodule during a routine examination of the neck. Nodules can also be discovered during examination or tests for an unrelated condition.

Thyroid nodules are clinically noted in 4% to 7% of the adult population[1] and, are incidentally found, in 25% of the adult population on ultrasound examination.[2] In a study of 300 sequential autopsies there were malignant neoplasias in 2.33% but occult carcinoma comprised 1% of the cases.[3] This represents a higher incidence as, in this study, females comprised only one third of the total autopsies. Occult tumors constitute 2-3% of thyroidectomies specimens in Toxic MNGs.[4] In Pakistan

***Correspondence:***
*Dr. M. Rafique Gooda*
*Dept of ENT and Head and Neck Surgery,*
*Hamdard University Hospital,*
*M A Jinnah Road, Karachi.*
*Phones: 0333-2103929.*
*E-mail: mrgooda_2000@yahoo.com*

thyromegaly is mostly prevalent (74%) amongst people living in the mountainous areas of the north,[5] and in those who have migrated to Karachi from these areas. Little data is available from Pakistan but there is a high incidence of goiter amongst dwellers of river banks in the Punjab.[6]

Diagnostic pre-operative tests can determine the nature of the thyroid nodule. There are several diagnostic tests and each provides unique information about the nodule. Tests are ordered based on medical history and physical examination. Tests provide a definitive answer about the type and cause of a nodule but if inconclusive may require further testing. FNA is easy, economical, has a high diagnostic value and is the investigation of choice when a diagnosis of malignancy is made.[2,6] Ultrasound shows up other nodules in 50% of patients with a clinically solitary nodule.[7,8]

Thyroid is a very vascular organ hence utilizing avascular planes and keeping close to the capsule prevents nerve damage, precludes the use of surgical drain and avoids an unsightly surgical scar in patients, most of whom are females.[9]

## METHODOLOGY

A retrospective study was conducted of the last 250 cases of thyroid surgeries to determine the nature of presentation, pathologies and the post operative complications encountered. Of the 250 patients 245 were females and 5 were males. Majority of them were in the third and fourth decades. (Fig.1) The average duration of the swelling before the first visit to the surgeon was 1 year to 3 years (aver: 15 months). The principal symptom was neck swelling, reported by all 250 patients (100%). Hoarseness, stridor or dysphagia was noted by 10%, 2% and 25% of patients. Dysphagia was proportionate to the size of the thyroid goiter. All patients had an ultrasound assessment to detect multinodularity and cystic changes and for assessment of the sizes of the nodules (Fig. 2). All patients had thyroid scan. T4 and TSH were done for those showing hot nodules. Unilateral cold thyroid nodules and the dominant nodule of the MNG (multinodular goiter) were subjected to FNAC to exclude malignancy. Hyperthyroid patients (39) were controlled before scheduling for surgery.

Dissection was kept as close to the thyroid gland as possible, sleeving it off the capsule and thus, respecting the integrity of the recurrent laryngeal nerve which lies behind the pretracheal fascia. No attempt was made to willfully identify the recurrent laryngeal nerve. The hemithyroid specimen was removed with the isthmus in all cases. Hemostasis was done with bipolar coagulation diathermy. All patients were discharged 24 to 48 hours after surgery. No patients were transfused blood. The results were compared over 4 weeks for skin discoloration, wound dehiscence, the time required for wound healing, post-operative swelling around the skin incision, cosmetic appearance and duration of hospital stay.

Patient's larynx was assessed at the time of extubation and on post-operative visits. The surgical specimens were sent for histopathological examinations and the results were reviewed. There were no anesthesia related complications.

## RESULTS

Pre-operative evaluation showed 180 patients (72%) had nodular disease and 70(28%) patients had non-nodular diffuse thyroid enlargement. Benign thyroid diseases constituted 95.2% of the thyroid enlargement whereas only 12 patients (4.8%) showed evidence of malignancy. Hyperthyroid patients were 39 and euthyroid patients were 211. One hundred and sixty patients were not provided vacuum drainage of the operated area. Six (2.4%) of them developed collection at the site which was aspirated a few times. Ninety patients with big

**Fig. 1. Age wise distribution of Patients**

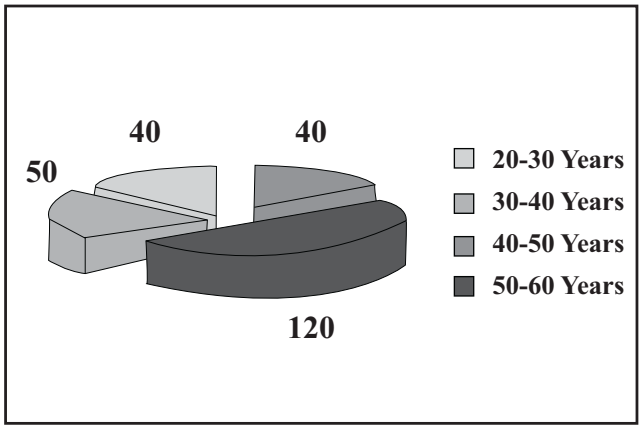
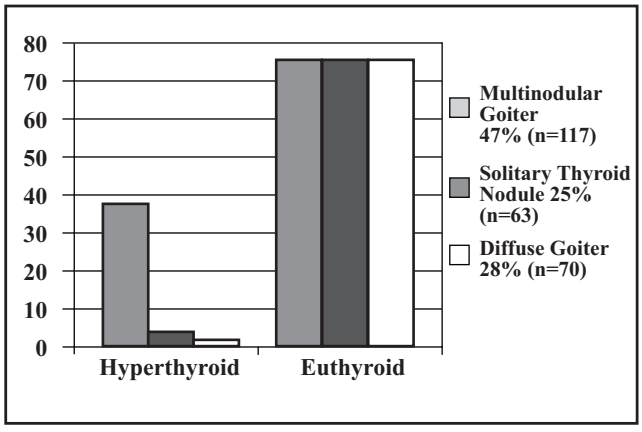



**Fig. 2. Functional state of the Thyroid**



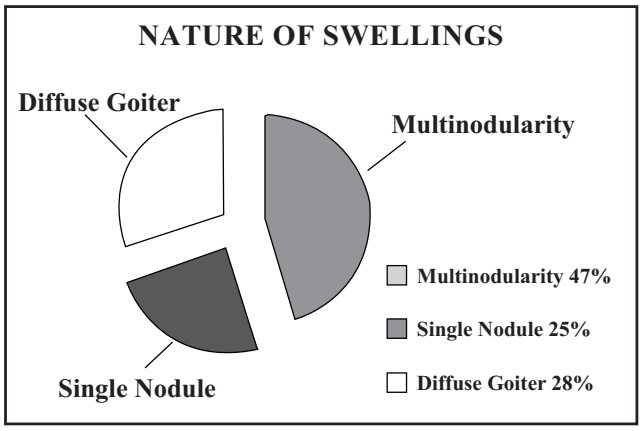



**Fig. 3. Clinical nature of Swellings**

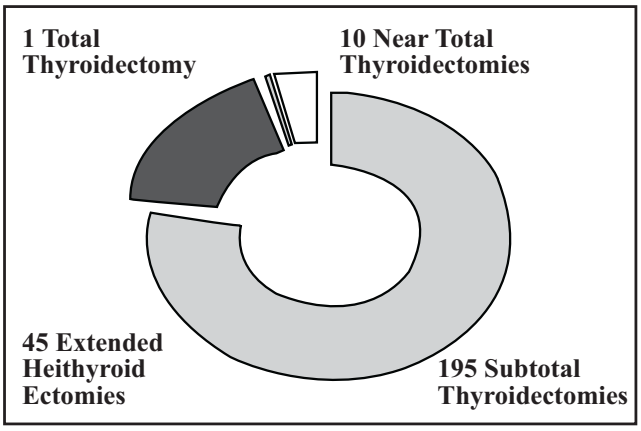



**Fig. 4. Distribution of lesion on Histopathological Examination**

goiters were provided vacuum drains to help obliterate their surgical spaces. One (0.4%) patient developed complete bilateral recurrent laryngeal nerve paralysis with early stridor. This patient had a papillary carcinoma with invasion of the trachea. One patient developed RLN paralysis after completion thyroidectomy for papillary carcinoma when the previous hemithyroidectomy done elsewhere had already resulted in damage to the RLN on the side. Three patients (1.2%) developed complete unilateral recurrent nerve paralysis. Six patients (2.4%) developed transient recurrent nerve paralysis which recovered completely over 3 months. One (0.4%) patient developed superior nerve paralysis. One patient (0.4%) developed parathyroid insufficiency which was controlled with drugs. None of the patients developed wound infection or cosmetic defects.

## DISCUSSION

The commonest symptom of thyroid enlargement is cosmetic. Pressure symptom was not the cause of presentation in our series except one patient who presented with a massive thyroid and infiltration of the trachea with hemoptysis. The causes of late presentation in our series are many: majority of the patients were male-dependent females from the remote areas with scarce health facilities and limited financial resources. Majority had no acute symptoms from thyroid enlargement. There are many investigation options available to the treating surgeon. The primary objective of investigation of the thyroid is:

To find out which lobe is involved.
Is it a solitary nodule or a MNG?
Is the nodule/s functioning?
Is it a benign or a malignant lesion?
Is there a retrosternal part?

Treatment of hyperthyroidism consists of giving symptomatic relief and decreasing the production of thyroid hormone.[10] Beta blocker ameliorates many of the symptoms of hyperthyroidism.[11] Toxic adenoma presents in a hyperthyroid patient with a palpable thyroid nodule that corresponds to an area of increased radioiodine concentration on thyroid scan; there is also suppression of radioiodine uptake in surrounding and contralateral tissue. Toxic multinodular goiter typically presents with one or more focal areas of increased radioiodine uptake, which may or may not correspond to palpable nodules. Nonfunctioning ("cold") nodules are also present in some patients. Some patients have obstructive symptoms, providing an additional indication for treatment.[12]

Many authors have claimed that hyperthyroidism protects against thyroid cancer and believe that the incidence of malignancy is lower in patients with toxic multinodular goiter (TMG). In a review of 294 patients operated between 2001-2005 for toxic and non-toxic multinodular goiter, incidence of malignancy was 9% in the toxic and 10.58% in non-toxic multinodular goiter group. It was concluded that the incidence of malignancy in toxic multinodular goiter is not low as thought earlier and is nearly the same as in non-toxic multinodular goiter.[13] In solitary thyroid nodule, cancer occurs in 5-10% depending on age, gender, radiation exposure history, family history, and other factors[14,15]. Differentiated thyroid cancer, which includes papillary and follicular cancer, comprises the vast majority (90%) of all thyroid cancers[16]. FNA is the most accurate and cost effective procedure of choice for evaluating thyroid nodules.[17]

Sonographic characteristics that are more likely to be malignant are the presence of micro calcifications, hypoechogenicity (darker than the surrounding thyroid parenchyma) of a solid nodule, and intranodular hypervascularity.[18,19] The detection of micro calcifications and nodular vascularity has good interobserver reliability.[20] Thyroid goiter is not so uncommon. Autopsies detect thyroid nodules in 50% of cases in those who

did not have a history of thyroid goiter.[20] Thyroid nodules are found by palpation in 4-8% of the general population in adults[21] whereas US detect 30-50% of nodules.[22,23] The malignancy rate has been reported at 7-15%; the malignancy rate within thyroid incidentalomas was 12-28.8%. The malignancy rate is increasing due to wide use of highly sensitive US for the routine health examinations.[24]

Regarding the incidence of malignancy in the surgical thyroid specimens our series shows an overall incidence of 4.8% which is significantly less than those reported in the international literature. A classic study published in 1976 showed a rising incidence of malignant tumors in goiters: 2.56% from 1944 to 1953 and 5.7% from 1964 to 1973. In 1976 this incidence was about 7%. In a study between 2001-2005 the incidence of malignancy was 9% in toxic and 10.58% in non-toxic multi nodular goiter group.[25]

In our series of 250 cases (456 nerves at risk) only 12 nerves (2.63%) were damaged. Six nerves (1.31%) were damaged transiently. We believe this low rate to be due to meticulous dissection in the plane near to the capsule of the thyroid, ligating the vessels near to the gland, keeping in mind the anatomy of the RLN and avoiding the use of diathermy in its proximity. The incidence of temporary and permanent cord palsy is reported to be 5.2% and 1.4% (3.3% and 0.9% of nerves at risk), respectively. Among factors analyzed, surgery for malignant neoplasm and recurrent substernal goiter was associated with an increased risk of permanent nerve palsy. Primary operations for benign goiter were associated with a 5.3% and 0.3% incidence (3.4% and 0.2% of nerves at risk) of transient and permanent nerve palsy, respectively.[26] In a literature survey, reports with identification of the recurrent nerve had significantly lower primary and permanent palsy rates when compared with reports without obligatory identification of the nerve ($p < 0.01$).[27] There are other conflicting reports, as regards RLN damage, which say that identification of RLN during subtotal thyroidectomies does not produce a statistically significant difference as when it is not identified in the subtotal thyroidectomies. But in total thyroidectomies the incidence of nerve paralysis increases from 3.8% to 7% when the nerve is not exposed or identified.[28] In our series we have not provided drainage to the 160 patients. This did not result in collection in the operated area and we believe it to be an advantage when the area is drained.

## CONCLUSION

Complications of thyroid surgery should be seen in the light of the diagnosis for which surgery is being done, the type of procedures being undertaken, the nature of dissection employed and whether they are being performed by the same pair of hands. Complications for completion surgeries should be rated separately. Prospective studies are needed to obtain true complication rates for each type of procedures performed with a defined surgical methodology. In our case study malignancy was not a significant diagnosis when compared to the international data.

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