GOITER: AN OTORHINOLARYNGOLOGIST'S EXPERIENCE AT A TEACHING HOSPITAL

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Date Submitted: November 19, 2013
Date Revised: May 25, 2014
Date Accepted: May 26, 2014

ABSTRACT

OBJECTIVES: 1) to study the presentations and findings of fine needle aspiration cytology (FNAC) and histopathology of goiter
2) to study the outcome of surgical procedures for goiter in otorhinolaryngology ward of a teaching hospital.

METHODOLOGY: This cross-sectional study was conducted in the department of ENT, Head and Neck Surgery, Lady Reading Hospital, Peshawar from May 2012 to April 2013. All the patients of any age and either gender having goiter requiring surgery were included. Every patient was evaluated in terms of detailed history, thorough examination and relevant investigations. Thyroidectomy was performed according to the nature and extent of disease. The data were collected on a predesigned proforma and analyzed using SPSS version 16.

RESULTS: Out of 72 patients, 62 (86.1%) were female and 10 (13.9%) were males. Mean age was 38.61±13.87 years The main complaint was anterior neck swelling (100%), lasting for >2 years in 51.4% patients. Both lobes of thyroid were enlarged in 51.4% patients and mean size of goiter was 2.18±0.71 cm^2. Solitary thyroid nodule was the commonest (45.8%) observation. Adenomatous colloid nodule was diagnosed 65.3% and 77.8% on FNAC and histopathology respectively. Malignancy was noted in 22.2% cases on histopathology. Partial thyroidectomy was performed in 43.1% cases. Complication rate was 23.6%; wound dehiscence (6.9%) and post-operative hematoma (5.6%) were the commonest complications.

CONCLUSION: Goiter was common in females of middle age and majority had solitary thyroid nodule. Benign adenomatous colloid nodule was the commonest findings on histopathology. Majority underwent partial thyroidectomy and complication rate was 23.6%.

KEY WORDS: Goiter, Thyroid Nodule, Partial Thyroidectomy, Total Thyroidectomy.

THIS ARTICLE MAY BE CITED AS: Wahid FI, Khan MR, Khan N, Khan Q, Javaid M, Haq N, et al. Goiter: An otorhinolaryngologist's experience at a teaching hospital. Khyber Med Univ J 2014; 6(2): 78-83.

INTRODUCTION

Thyroid gland is the most important among endocrine system located in the neck. It has a key role in the growth of the body. Enlargement of thyroid gland irrespective of its function is known goiter. About 5% of the world's population is suffering from goiters and associated disorders, and about 75% of these people live in iodine deficient regions.[1] Worldwide, more than 1.9 billion people are at the risk of iodine deficiency disorders.[2]

Goiter can be solitary, multinodular or diffuse acute or chronic affecting about one-third population across the globe. Simple (diffuse) physiological goiter is the most common thyroid disease in the community. With increasing age, prevalence of diffuse goiter decreases as compared to thyroid nodules.[3] Prevalence of thyroid nodule varies according to the diagnostic modality used and it has been reported as 2-6% on palpation, 19-35% on ultrasonography and 8-65% on autopsy.[4] The prevalence of thyroidal nodule is on rise in the recent decades due to increased diagnostic neck imaging and deficient iodized salt in most of the developing countries. The thyroid nodule is more common in females than males.[3,5,6]

The main clinical presentation of thyroid nodule is anterior neck mass, compressive symptoms like dysphagia or dyspnea and features of malignant transformation or metastasis. Thyroid nodule needs proper evaluation in terms of clinical assessment, thyroid function tests, thyroid ultrasonography and if required thyroid scan, thyroglobulin and fine needle aspiration cytology (FNAC) to rule out thyroid cancer. Thyroid cancer is the fifth most common cancer in women[7] and the most common endo-

crine malignancy in human, accounting for 1.0%–1.5% of all new cancers diagnosed every year in the USA.[8] The incidence of thyroid malignancy is rising over the last 3 decades.[9] Thyroid cancer is more frequent in single thyroid nodule as compared to multinodular goiter (MNG), although this finding is more relevant to iodine-deficient populations.[10]

Thyroid surgery is the commonest endocrine surgery performed worldwide. The indications for thyroid surgery are compression-induced symptoms, diagnosis of malignancy, suspicion of malignancy, medically uncontrolled hyperthyroidism and cosmesis.[11] Postoperative complications of thyroid surgery are not uncommon and include transient and permanent hypoparathyroidism, recurrent laryngeal nerve paralysis or injury, hematoma, seroma, chyle fistula, Horner's syndrome, and injury to some motor nerves in the neck.[12-14] Reported mortality of thyroid surgery is extremely low (<1%)[15] and overall complication rate varies from 7.4%-53%, depending upon the operations performed.[16,17] Nonetheless major complications of thyroidectomy in form of rapid extensive hematoma, recurrent laryngeal paralysis and hyporparathyroidism are still challenging for ENT surgeon.[3]

As a reasonable fraction of our society is suffering from goiter. Thyroidectomy is the commonest among neck surgeries carried out in our set up. So this study was framed to study the pattern of presentations, findings of fine needle aspiration cytology (FNAC) and histopathology of goiter and to study the outcome of surgical procedures for goiter in otorhinolaryngology ward of a teaching hospital of Peshawar, Pakistan.

METHODOLOGY

This cross-sectional study was conducted in the department of ENT, Head and Neck Surgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar, from May 2012 to April 2013, with 6 months follow up. All the patients of any age and either gender diagnosed and required thyroid surgery were included while those refusing surgery or operated in other hospital were excluded from the study.

After being admitted to the department of ENT, every patient was meticulously evaluated in terms of detailed history, thorough examination and relevant investigations to get accurate diagnosis and treatment. Pre-operative indirect laryngoscopy was performed in all cases to look for vocal cord status and post-operative laryngoscopy if needed. Investigations included thyroid function tests, ultrasonography neck, fine needle aspiration cytology, pre-operative and post-operative serum calcium level and thyroid scan or CT scan if needed. Each patient was thoroughly assessed for occurrence, duration, presentation, progression of goiter and any other symptom favoring malignant transformation of the goiter. Post-operative serum calcium level ≤7 mg/dl requiring calcium replacement was labeled temporary hypocalcaemia if it persisted less than six months and permanent hypocalcaemia if it was more than six months.

Every patient was subjected to complete examination of the goiter, upper aero-digestive mucosal lining and detailed systemic examination. A well informed consent was taken from every patient explaining the procedure, its risks, benefits and associated complications. Before starting the research, ethical approval has been obtained from hospital ethical board.

Thyroidectomy was performed if the patient was euthyroid, while those with hyperthyroidism or hypothyroidism were treated medically prior to surgery till become euthyroid. All the patients were operated under general anesthesia with endotracheal intubation except few cases operated under local anesthesia as they were not fit for general anesthesia. The patient was properly cleaned and draped. After giving collar skin incision, Subplatysmal flap was elevated on both side of the incision up to thyroid cartilage superiorly and level of clavicle inferiorly. Strap muscles were splited in midline, but where goiter was difficult to deliver, muscles were severed. Inferior thyroid artery was identified and ligated on one side only to preserve blood supply to parathyroid gland. Recurrent laryngeal nerve was searched in relation to inferior thyroid artery and secured. Thyroidectomy was performed according to the nature and extent of the disease. Hemostasis was carried out and redivac drain was put in wound for at least 24 hours. Wound was closed in layers and every patient was put on injectable ceftriaxone and analgesics. The data were collected on a predesigned proforma and analyzed using SPSS version 16.

RESULTS

Out of 72 patients, 62(86.1%) were female and 10 (13.9%) were males, with female: male ratio of 6.2:1. Age of the patients ranged from 14-70 years with mean age of 38.61±13.87 years. Most of patients presented in 2nd (25%) and 4th (22.2%) decade of life (Table 1).

The main complaints were anterior neck swelling (100%), breathlessness (25.0%) and hoarseness (6.9%). The complaints were lasting for more than 2 years in most of the patients (n-37, 51.4%), followed by 1-2 year and less than one year in 38.9% and 9.7% respectively. In majority of patients (n=37,51.4%) both lobes of thyroid were enlarged. Mean size of goiter was 2.18±0.71 cm^2, while in maximum (n=33,45.8%) patients the size of goiter was 6-10 cm^2. Solitary thyroid nodule was the commonest finding (n=33, 45.8%) on ultrasonography of neck [Table II].

Enlargement in size of the goiter was significantly associated with duration

TABLE I: AGE-WISE DISTRIBUTION OF PATIENTS (n-72)

Age in years	Frequency	Percentage
≤ 20	9	12.5%
21-30	18	25%
31-40	15	20.8%
41-50	16	22.2%
51-60	12	16.6%
≥70	2	2.7%
Total	72	100%

TABLE II: CLINICO-RADIOLOGICAL CHARACTERISTICS OF GOITER (n=72)

Characteristics	Frequency	Percentage
Side of Swelling		
Both sides	37	51.4%
Right side	21	29.2%
Left side	14	19.4%
Size of the swelling		
Swelling <5 cm^2	13	18.1%
Swelling 6-10 cm^2	33	45.8%
Swelling >11 cm^2	26	36.1%
Ultra sound neck finding		
Single thyroid nodule	33	45.8%
Multiple thyroid nodules	15	20.8%
Diffusely enlarged thyroid gland	24	33.3%

TABLE III: FINE NEEDLE ASPIRATION CYTOLOGY AND HISTOPATHOLOGY FINDINGS (n-72)

Characteristics	Frequency	Percentage
Fine needle aspiration cytology findings		
Adenomatous colloid nodule	47	65.3%
Suspicious of malignancy	10	13.9%
Inconclusive	4	5.6%
Papillary carcinoma	4	5.6%
Follicular carcinoma	2	2.8%
Medullary carcinoma	2	2.8%
Squamous cell carcinoma	1	1.4%
Non-malignant diseases	2	2.8%
Total	72	100.0%
Histopathology findings		
Benign adenomatous colloid nodule	56	77.8%
Papillary carcinoma	8	11.1%
Follicular carcinoma	4	5.6%
Medullary carcinoma	3	4.2%
Squamous cell carcinoma	1	1.4%
Total	72	100.0%

of swelling (P=0.05). Minimum stay of the patient in hospital was 3 days while maximum stay was 15 days with average stay of 7.2 days (Fig 1).

Fine needle aspiration cytology was performed in all cases and adenomatous colloid nodule was the commonest finding (65.3%), followed by suspicious of malignancy (13.9%). All the thyroid specimens were subjected to histopathology study, where benign adenomatous colloid nodule was on top (77.8%), followed by papillary carcinoma in 11.1% cases (Table III). As benign thyroid lesions were common in this study, hence partial thyroidectomy (31/72= 43.06%) was the commonly performed surgery with frequency of right hemithyroidectomy (25%), left hemithyroidectomy (18.6%) while subtotal thyroidectomy was the second most common surgery in 33.3% cases (Table IV). The common complications were wound dehiscence in 6.9% cases and post-operative hematoma in 5.6% cases (Table V).

DISCUSSION

Thyroid surgery is the commonest endocrine surgery performed around the globe. It got popularity in the early twentieth century due to development of safe anesthesia, invention of sophisticated surgical instrument and adaptation of antiseptic techniques. In the past thyroid surgery was mainly performed by general surgeon, but now-days this surgery is preferably the domain of ENT surgeon with promising results and minimum complication due to possessing more sound knowledge of neck anatomy. Female preponderance was observed with female: male ratio of 6.2:1, simulating Vyas CS, et al[18] reporting female to male ratio of 7:1, and contradicting results of Khanzada TW[19] and Ali MA[20] where female to male ratio was 9:1, 12.2:1 respectively. The reason for female preponderance could not be established. The age range was 14-70 years with

TABLE IV: TYPES OF SURGICAL PROCEDURES PERFORMED (N-72)

Types of surgery performed	Frequency	Percentage
Right hemithyroidectomy	18	25.0%
Left hemithyroidectomy	13	18.6%
Subtotal thyroidectomy	24	33.3%
Near total thyroidectomy	7	9.7%
Total thyroidectomy	7	9.7%
Completion thyroidectomy	1	1.4%
Total thyroidectomy with neck dissection	1	1.4%
Isthmusectomy	1	1.4%
Total	72	100.0%

TABLE V: COMPLICATIONS OBSERVED DURING SURGICAL PROCEDURES PERFORMED IN 72 CASES

Complications	Frequency	Percentage
No complication	55	76.4%
Wound dehiscence	5	6.9%
Post-operative hematoma	4	5.6%
Seroma collection	3	4.2%
Temporary hypocalcaemia	2	2.8%
Unilateral Recurrent laryngeal nerve palsy	1	1.4%
Permanent hypocalcaemia	1	1.4%
Bilateral recurrent laryngeal nerve palsy	1	1.4%
Total	72	100.0%

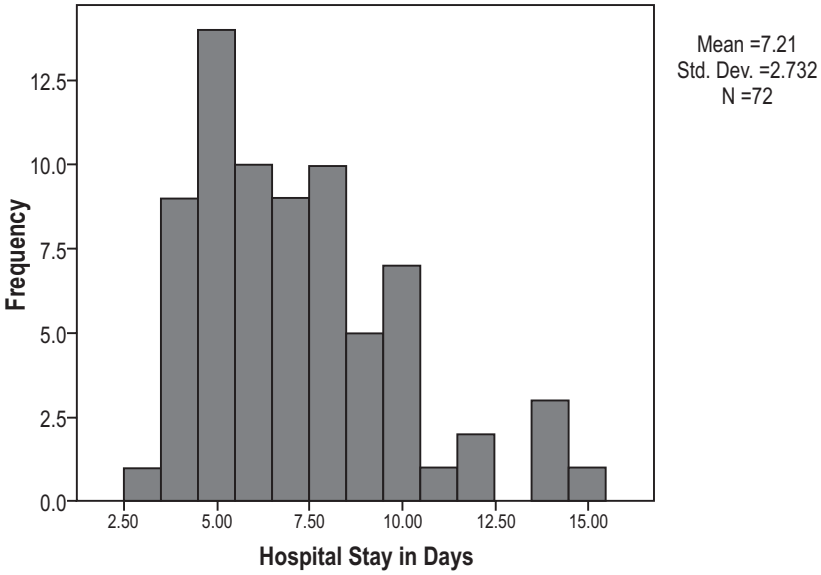

Fig 1: Hospital stay of patients in days (n-72)

mean age of 38.61±13.87 years which is consistent with literature.[21,22]

Presenting features included anterior neck swelling (100%), breathlessness (25.0%) and hoarseness (6.9%), which are contrary to results of Vyas CS, et al18 where main presentations were palpitation (14%), decreased appetite (11%), and weight loss (8%). However these were in accordance to the report of Gupta N[23] with thyroid swelling (100%), shortness of breath (22.9%) and hoarseness (5.5%). Neck swelling was lasting for more than 2 years in most of the patients (51.4%), while the neck swelling duration was less than one year only in 9.7% patients which is also contradictory to Vyas CS, et al[18] where majority of patients (70%) presented within a period of one year while 40% patients presented with swelling of duration less than 6 months. The explanation for this delayed presentation in our study could be poverty, negligence on the part of patient and lack of health facility in far-flung areas of our province.

In this study enlargement of right, left and both lobes occurred 45%, 19.4% and 51.4% respectively that is consistent with study of Sengupta A et al[24], who observed that swelling of the right, left and both lobes were 43.3%, 19.7% and 13.5% respectively. We found that size of goiter ranged from 1-4 cm, with average of 2.2 cm that is also in accordance to finding of Sengupta A et al[24] showing average size of goiter as 2.8 cm. However it was found that size of the goiter was significantly associated with duration of swelling (P=0.05), which is also supported by the study of Agarwal A.[25]

In this study solitary thyroid nodule was 58.3% and multinodular goiter was 41.7%, that differs from study of Jawaid MA, et al[21] where solitary thyroid nodule was 39.1%% and multinodular goiter was 54.9%. The mean post-operative hospital stay of patients was 7.2±2.73 days with range of 3-15 days simulating study by Ali N et al[26] where mean hospital stay was 7.6±2.34 days (range 5-15) but it is greater than report of Ali MA's[20] study where average hospital stay was 3-4 days.

The finding of FNAC in this study were adenomatous colloid nodule (65.3%), suspicious of malignancy (13.9%) and among malignant lesion

papillary carcinoma accounted for 5.6%, supported by results of Bagga PK et al[27] showing benign colloid nodule in 74.1% cases, and suspicious of malignancy in 6.7% cases. Moreover in Likhar KS et al[28] report, adenomatous colloid nodule was present in 66.67% cases, and papillary carcinoma in 3.7%. Similarly our FNAC findings were also keeping with study of Pandy P et al,[29] where colloid nodule was diagnosed in 72.03% cases, suspicious cases were present in 18.79% and papillary carcinoma in 4.69% cases.

In this study histopathology findings were benign adenomatous colloid nodule in 77.8%, papillary Carcinoma in 11.1%, follicular carcinoma in 5.6% and medullary carcinoma in 4.2% cases, that is comparable to the study of Sushel C et al[22] who revealed that histopathology findings were adenomatous colloid goiter in 60%, papillary carcinoma in 7.85% and follicular carcinoma in 2.1% cases. Our histopathological results were in agreement with results of Huque SM et al[30], who found non neoplastic nodular goiter in 52.54%, papillary carcinoma in 13.55% and follicular carcinoma in 3.38% cases. We noted that commonly performed surgery was partial thyroidectomy (43.1%), subtotal thyroidectomy (33.3%), right hemithyroidectomy (25.0%), left hemithyroidectomy (18.1%), and total thyroidectomy (9.7%), that is comparable to the results of Khanzada TW, et al[19] who reported that hemithyroidectomy was the commonest (37.1%) surgery, followed by subtotal thyroidectomy (40.7%) and near total thyroidectomy (7.8%). This is also favored by work of Huque SM et al[30], with results of hemithyroidectomy in 83.05%, total thyroidectomy in 11.02% and total thyroidectomy with neck dissection in 5.08% cases.

The complications in this study were wound dehiscence (6.9%), post-operative hematoma (5.6%), temporary hypocalcaemia (2.8%) and recurrent laryngeal nerve palsy (1.4%). Similarly Khanzada TW, et al[19] reported post-operative complications as hypocalcaemia (3.5%), postoperative bleeding (1.4%), seroma formation (1.4%), and wound infection (0.7%), while in Ali's[6] study postoperative complications recorded as wound infection 6%, and sub-cutaneous seroma 6%. Similarly in study of Ali N, et al,[26] complications observed were hypocalcaemia (6.4%), tension hematoma (2.5%) and wound infection (1.2%).

CONCLUSION

Goiter was common in females of middle age and majority had solitary thyroid nodule. Benign adenomatous colloid nodule was the commonest findings on histopathology. Majority underwent partial thyroidectomy and complication rate was 23.6%. FNAC is a reliable tool of investigation for thyroid nodule. Early and meticulous surgery of the nodule produces promising results. Although benign adenomatous colloid nodule is the commonest finding in thyroid swelling, however malignant transformation may be kept in mind in long lasting thyroid nodule irrespective of its size.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

FIW: Conception and design, acquisition of data, drafting the manuscript, final approval of the version to be published

MRK, NK & QK: acquisition of data, final approval of the version to be published

MJ & NH: analysis and interpretation of data, drafting the manuscript, final approval of the version to be published

IAK: critical revision, final approval of the version to be published

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

CONFLICT OF INTEREST

Authors declare no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE

NIL

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