Original Article

FREQUENCY AND HISTOPATHOLOGICAL EVALUATION OF MALIGNANCIES IN MULTINODULAR GOITER

Syed Qaiser Husain Naqvi,[1] Dharmoon Arijia,[2] Saima Arshad,[3] Jan Muhammad Memon,[4] M. Rafiq Memon,[5] Ali Gohar Bozdar[6]

Abstract

Objective: To determine the frequency and types of various malignancies in patients presented with multi-nodular goiter (MNG).

Study Design: Observational Prospective study.

Place and Duration: Conducted in the departments of Pathology and Surgery, Peoples University of Medical and Health Sciences (PUMHS) Nawabshah, department of Surgery Ghulam Muhammad Mahar Medical College Hospital Sukkur, cases were also collected from the private clinics.

Duration: January 2008 June 2013.

Patients and Methods: All adult patients irrespective of sex were recruited presented during the study period with MNG on clinical examination or on ultrasound of neck. The demographic data was collected on a pro-forma. Pre-operative fine needle aspiration cytology (FNAC) was performed of any dominant nodule which was suspicious on ultrasound examination. Serum TSH, FT_3 and FT_4 levels were also evaluated to determine the toxic status of the patient. The patients were underwent total thyroidectomy and the resected specimens were sent in formalin for histopathological examination, and after collection of reports the results were tabulated.

Results: In current study 144 patients having aged between 18 – 63 years were analyzed, including 18 (12.5%) male and 126 (87.5%) female. The male to female ratio was 1:7. The majority of patients were presented in 2^{nd} to 4^{th} decades of their life. All (144) of the cases were having major complain of swelling in front of neck of various duration. On histological examination 132 (91.7%) were benign and diagnosed as MNG, while 12 (8.3 %) cases were diagnosed as malignant lesion. The malignant lesion consists of papillary carcinoma in 09 (75%) cases. Follicular carcinoma was detected in 02 (16.7%) cases and madullary carcinoma was diagnosed in one case.

Conclusion: The current study highlights the risk of

Naqvi S.Q.H.[1]
Associate Professor, Department of Pathology
Peoples University of Medical and Health Sciences, Nawabshah

Arijia D.[2]
Assistant Professor of Surgery
Ghulam Muhammad Mahar Medical College, Sukkur

Arshad S.[3]
Consultant Department of Surgery
Ghulam Muhammad Mahar Medical College, Sukkur

Memon J.M.[4]
Professor and Head of Department Surgery
Ghulam Muhammad Mahar Medical College, Sukkur

Memon M.R.[5]
Professor of Surgery
Ghulam Muhammad Mahar Medical College, Sukkur

Bozdar A.G.[6]
Associate Professor of Surgery
Ghulam Muhammad Mahar Medical College, Sukkur

malignancy in multinodular goiter. The frequency of malignancy in MNG was 8.3% present more in females. The papillary carcinoma was the dominant variant.
Key Words: MNG, Throidectomy, Malignancy, Papillary Carcinoma.

Introduction

Malignancy in thyroid gland is a rare entity account for 1% of all cancers,[1] but it is most frequent cancer among all endocrine glands.[2-3] The multinodular goiter (MNG) is a common presentation in thyroid diseases.[4] It has been considered that the patients with MNG has a low risk of developing malignancy as considered to solitary thyroid nodules, but now it is indicated by various studies that the prevalence of malignancy in MNG has not much difference with solitary thyroid nodules,[5] and the documented incidence of carcinoma in patients with MNG varies 2.92 – 29%.[7-10]

Due to risk of occult malignancy, all the cases of MNG need close follow-up for malignancy.[11] In current study the total thyroidectomy specimens of MNG were evaluated histopathologically to determine the frequency and types of various malignancies in patients presented with MNG in our setup.

Material and Methods

This prospective study was conducted in the public and private sector, including departments of Pathology and Surgery, Peoples University of Medical and Health Sciences (PUMHS) Nawabshah, department of Surgery Ghulam Muhammad Mahar Medical College Hospital Sukkur, from January 2008 June 2013.

All adult patients irrespective of sex were recruited presented during the study period with MNG on clinical examination or on ultrasound of neck. The patients were collected from out patients department of the hospital and also from the private clinics. The demographic data was collected on a proforma (Table 1).

Table 1: Demographic Data.

Total number of cases		144
	Male	18 (12.5%)
	Female	126(87.5%)
Age (Years)		18 – 63
	Mean	35.8
	Male : Female	1:7

The inclusion criteria consist of all the euthyroid patients, irrespective of their sex presented with MNG, given voluntary consent. The exclusion criteria consists of any associated co-morbidity, patients having family history of thyroid cancers, any pre-operative evidence of malignancy (by fine needle aspiration cytology or ultrasound examination), previous exposure to radiation, and patients taken radioactive iodine therapy.

Pre-operative fine needle aspiration cytology (FNAC) was performed of any dominant nodule which was suspicious on ultrasound examination. Serum TSH, FT_3 and FT_4 levels were also evaluated to determine the toxic status of the patient. All of 144 patients were underwent total thyroidectomy and the resected specimens were sent in formalin for histopathological examination, and after collection of reports the results were tabulated.

Results

In current study 144 patients having aged between 18-63 years were analyzed, including 18 (12.5%) male and 126 (87.5%) female, with a mean aged 35.8 years. The male to female ratio was 1:7.

The majority of patients cases were presented in 2^{nd} to 4^{th} decades of their life (Table 2). All (144) of the cases were having major complain of swelling in front of neck of various duration, the next frequent complaint was dyspnoea in 37 (25.7) cases, followed by dysphagia in 16 (11.1) cases (Table 3).

On histological examination 132 (91.7%) were benign and diagnosed as MNG, while 12 (8.3 %) cases were diagnosed as malignant lesion having two cases in male and remaining 10 malignancies in females. The malignant lesions consists of papillary carcinoma in 09 (75%) cases among them two cases were diagnosed in male and 07 were in females. Follicular carcinoma was detected in 02 (16.7%) cases and madullary carcinoma was diagnosed in one case (Table 4).

Discussion

Multinodular goiter is diagnosed when multiple distinct nodules are palpated in an enlarged thyroid gland.[7] These nodules may be hindered by the short and thick neck,[4] and it is difficult to detect clinically when these are less than 1 cm in diameter.[4,12] MNG is the common clinical presentation for thyroid cancer in Pakistan, and at time of presentation distant metastases

have been observed in a higher percentage of these cases which there by reduces the chances of favorable outcome.[13] Surgery for thyroid diseases is a frequent operation,[14] the solitary or multiple nodules producing pressure symptoms or cosmetic problems are best treated by surgery.[2] Surgery is also offered in MNG for toxicity and when malignancy is suspected.[15]

Significance of MNG with malignancy is a longstanding unresolved issue[7], and it is the primary challenge in the management of nodular goiter to rule out the chances of malignancy[2]. The preoperative diagnosis of thyroid cancer by means of fine needle aspiration cytology is not feasible in MNG due to multinodularity and thyroid cancer is an unexpected postoperative finding.[16,17]

In current study the age of patients were ranging between 19-63 years with a mean age of 36.8 years. The most of the cases presented in 2nd to 4th decade of their life. These findings were in line with other national studies.[18,19] The majority of cases of malignancy were diagnosed in age between 20 – 40 years, which confirms the findings of other studies.[9,20-22]

The present study detected 8.3% frequency of malignancy in MNG which agrees the reported frequency by various researches at different parts of the world including Pakistan[17,23] but some studies shows a very high 29%[10] and low 2.92%[9] rate due to unknown reasons. The papillary carcinoma was found as most common variant comprising 09 (75%) of malignant cases, while the follicular carcinoma was found in 2 (16.7%) cases and madullary carcinoma was detected in only one case comprising 8.3% of malignant lesions. Various studies at different parts of world indicates the papillary carcinoma as dominant variant,[2,11,16,18] but some worker from Nigeria detected follicular variant as the commonest type in thyroid cancers presented as MNG[24,25].

Table 2: Distribution of Age Groups (n = 144).

Age Group	No. of Patients N (%)	No of Male Patients N (%)	No of Female Patients N (%)
≤ 20	3 (2.08)	1 (33.33)	2 (66.66)
21 – 30	57 (39.58)	5 (8.77)	52(91.22)
31 – 40	46 (31.94)	7 (15.21)	39 (84.78)
41 – 50	31 (21.52)	4 (12.90)	27 (87.09)
51 – 60	05 (3.47)	1 (20)	04 (80)
> 60	02 (1.38)	00 (00)	02 (100)
Total	144 (100)	18(12.5)	126 (87.5)

Table 3: Presenting Complaints (n = 144).

S. No.	Complaints	No of Cases (%)
01	Neck (thyroid) swelling	144
02	Dyspnoea	37 (25.7)
03	Dysphagia	16 (11.1)
04	Pain in swelling	02 (1.4)
05	Hoarseness of voice	01 (0.7)
06	Cervical lymphadenopathy	01 (0.7)

Table – 4. Histopathological Diagnosis (n=144)

No. of malignant cases N = 12 (8.33%)			No. of Benign Cases n = 132 (91.66%)
Type of malignancy	n (12)	n (144)	n = 132 (91.66%)
Papillary Carcinoma	9 (75%)**	9 (6.25%)*	
Follicular Carcinoma	2 (16.66%)*	2 (1.38%)	
Medullary Carcinoma	1 (8.33%)	1 (0.69%)	

*p value < 0.05 (significant)
**p value < 0.01 (highly significant)

Conclusion

The current study highlights the risk of malignancy in multinodular goiter, which should not be underestimated, and all the resected specimens needs thorough histopathological examination to rule out any possibility of malignancy. The frequency of malignancy in MNG was 8.3% present more in females. The papillary carcinoma was the dominant (75%) variant, followed by follicular carcinoma (16.7%) and madullary carcinoma (8.3%).

References

1. Romana T, Netea – Maier, Katja KH, et al. Trends in incidence and mortality of thyroid carcinoma in The Netherlands between 1989 and 2003: Correlation with thyroid fine needle aspiration cytology and thyroid surgery. Int J Cancer, 2008; 123: 1681-4.
2. Khurshid A, Gulab D, Bakhat Z, Isteraj S. The frequency of malignancy in nodular goiter – A single center study. JPMI, 2012; 26 (1): 96-101.
3. Najmul I. Thyroid Carcinoma. J Pak Med Assoc. 2011; 61 (10): 949-50.
4. Pang HN, Chen CM. The incidence of cancer in nodular goiter. Ann Acad Med Singapore, 2007; 36: 241-3.
5. Rehman AU, Lodhi S, Anwar M. Histopathological evaluation of 432 cases of goiter. Annals, 2009; 15: 54-6.
6. Rehman GA, Abdul KAY, Olatoke SA, Yusuf IF, Brimoh KT. Unusual cutaneous metastatic follicular thyroid carcinoma. J Surg Tech Case Report, 2010; 2: 35-8.
7. Abu-Eshy SA, Khan AR, Khan GM, al-Humaidi MA, al-Shehri MY, Malatani TS. Thyroid malignancy in multinodular goiter and solitary nodule. J R Coll Surg Edinb. 1995; 40 (5): 310-2.
8. Shah SH, Muzaffar S, Soomro IN. Morphological patterns and frequency of thyroid tumors. J Pak Med Assoc. 1999; 49: 131-3.
9. Haq RN, Khan BA, Chaudhry IA. Prevalence of malignancy in goiter: a reivew of 748 thyroidectomies. J Ayub Med Coll Abbottabad, 2009; 21 (4): 134-6.
10. Mofti AB, Al Momen AA, Suleiman SI, Jain CC, Assaf HM. Experience with thyroid surgeryin security forces hospital, Riyadh. Saudi Med J. 1991; 12: 504-6.
11. Hanumanthappa MB, Gopinathan S, Rithin S, et al. The incidence of malignancy in multinodular goiter: A prospective study at a tertiary academic centre. J Clin Diag Res. 2012; 6 (2): 267-70.
12. Tan GH, Gharib H, Reading CC. Solitary thyroid nodule. Comparison between palpation and ultrasonoghaphy. Arch Intern Med. 1995; 155: 2418-23.
13. Zuberi LM, Yawar A, Islam N, Jabbar A. Clinical presentation of thyroid cancer in Pakistan AKUH experience. J Pak Med Assoc. 2004; 54: 526-8.
14. Rathi PK, Shaikh AR, Shaikh GA. Identification of recurrent laryngeal nerve during thyroidectomy decreases the risk of nerve injury. Pak J Med Sci. 2010; 26 (1): 148-51.
15. Pedamalu R, Pedamalu SB, Rame RK, Pedamalu CS. Incidence of occult carcinoma in multinodular goiter which was diagnosed on the basis of histopathological findings. Int J Surg. 2008; 17 (1):
16. Nadeem K, Akhtar N, Tarar JM. Thyroid malignancy in multinodular goiter; Incidence, a retrospective study in southern punjab. Professional Med J. 2013; 20 (4): 587-90.
17. McCall A, Jarosz H, Lawrence AM, Paloyan E. The incidence thyroid carcinoma in solitary cold nodule and multinodular goiter. Surgery, 1986; 100: 1128-32.
18. Waseem M, Tariq WK, Abdul S, Basant K. Incidence thyroid carcinoma in multinodular goiter. Rawal Med J. 2010; 35 (1): 65-7.
19. Waqar T, Ali N. Cold thyroid nodule; A comparison of fine needle aspiration cytology with histopathology. Professional Med J. 2006; 13 (4): 498-503.
20. Pier PG, Antonio F, Maurizio R, et al. The incidence thyroid carcinoma in multinodular goiter: retrospective analysis. Acta Bio Medica Ateneo Parmense, 2004; 75: 114-7.
21. Naimat U, Qaiser K, Muhammad S, Habib ur Rehman A, Naseer A. Completion thyroidectomy for differentiated thyroid carcinoma. JPMI, 2009; 123: 1681-4.
22. Lindsey E, Kangmin Z, Elaine R, et al. Rising thyroid cancer incidence in United States by demographic and tumor characteristics, 1980-2005. Cancer Epidemiol Biomarkers Prev 2009; 18: 784-91.
23. Waqar T, Younas S, Riaz F. Incidental thyroid carcinoma in multinodular goiter. Ann King Edward Med Uni. 2006; 12 (4): 477-9.
24. Nggada HA, Ojo OS, Adelusola KO. A histopathological analysis of thyroid diseases in Ile-ife, Nigeria. A review of 274 cases. Niger Postgrad Med J. 2008; 15: 47-51.
25. Abdulkareem FB, Banjo AA, Elesha SO. Histological review of thyroid lesions. A 13 years retrospective study (1989 – 2001). Niger Postgrad Med J. 2005; 12: 210-4.