Prevalence of Malignancy in MNG: Final Histopathology Perspective

Abdul Waheed1*, Ghulam Shabir Mehar2, Muhammad Razzaq Dogar3, Junaid Hussain4, Amrat Kumar5 and Ahmed Hussain Pathan6

1Department of ENT, KVSS Hospital, Karachi, Pakistan.
2Department of ENT, Ghulam Muhammad Mehar Medical College, Sukkur, Pakistan.
3Department of Head and Neck Surgery, Jinnah Postgraduate Medical Centre/ISMU, Karachi, Pakistan.
4Department of ENT, Pir Abdul Qadir Shah Jeelani Institute of Medical Science, Gambat, Pakistan.
5Department of ENT, Isra University, Hyderabad, Pakistan.
6Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan.

Authors’ contributions

This work was carried out in collaboration among all authors. Authors AW and GSM were involved in conception of idea and study design. Authors JH and AK did data collection and performed bench work. Author MRD performed the statistical analysis. Author AHP managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To determine the malignancy in multinodular goiter by doing final histopathology of specimen.
Study Design: This is an observational study.
Setting: Study carried out in the department of ENT, Head & Neck Surgery of Khairpur Medical College Hospital Khairpur, from August 2016 to July 2019.
Materials and Methods: All those patients with MNG with or without thyrotoxicosis were selected and advised for Thyroid function tests, ultrasound thyroid and serum calcium level. FNAC was performed only in cases with suspicious nodule. All the patients under went total/near total...
thyroidectomy after all base line routine investigations along with thyroid function tests. Histopathological evaluation was also conducted.

**Results:** Out of total 70 patients with MNG, 17 (24.3%) cases were suspected of malignancy. Out of 17 suspicious cases, FNAC showed colloid goiter in 8 (47%), follicular in 7 (41%) cases and papillary in 2 (12%) cases. Final histopathology showed total 5 (29%) cases as malignant and remaining 12 (71%) cases were benign. Out of 5 malignant cases, 4 (80%) cases were papillary and 1 (20%) cases were Follicular cell carcinoma. While other 53 (75.7%) cases under went for near total thyroidectomy and specimens sent for histopathology, among these only 1 (2%) case found as Papillary cell Carcinoma. Total 6 cases were malignant out of which in 5 cases were Papillary cell Carcinoma and one was Follicular cell Carcinoma.

**Conclusion:** We conclude that multinodular goiter is the most prevalent thyroid disease found in female. Follicular thyroid carcinoma is the most frequent cancer seen in this study.

**Keywords:** Multinodular goiter; thyroid nodules; FNAC.

### 1. INTRODUCTION

Multinodular goiter (MNG) is one of the common presentations of various thyroid diseases [1]. The prevalence of thyroid nodules ranges from 4-7% on neck palpation while on histopathology, its prevalence reported from 63-93.5% [2]. Moreover, a study has reported that the most common mechanism of detection for the asymptomatic group was routine physical examination (43%), (24%) were incidental findings on imaging tests performed for non-thyroid-related reasons [3]. Traditionally it was thought that MNG is a benign disease but recently it has been discovered that thyroid malignancy can occur even in MNG [4]. Various studies has reported insignificant difference in incidence of malignancy in both MNG and solitary [5,6]. Nodular Goiter and incidence of carcinoma in patients with MNG varies from 7-17% [7,8]. The risk of thyroid malignancy in the nodules of MNG is comparable to that which exists in solitary thyroid nodules, the possibility of thyroid malignancy should be considered in all patients with MNG [9].

Multinodular goiter is one of the common health issue in Pakistan [10,11]. The exact incidence of malignancy is still unknown due to lack of nationwide data. For the same reason, this study was conducted with the aim to determine the spectrum of histopathological diagnoses encountered in patients undergoing thyroid surgery.

### 2. MATERIALS AND METHODS

An observational study was carried out in the department of Ear, Nose, Throat head & Neck surgery of Khairpur Medical College Hospital Khairpur, from August 2016 to July 2019 through non-probability consecutive sampling. All those patients with MNG with or without thyrotoxicosis were selected and advised for thyroid function tests, ultrasound thyroid and serum calcium level. The patients with thyrotoxicosis were treated first medically to become euthyroid then all patients under went total/near total thyroidectomy. None of our selected patients have history of radiation to the neck. The patients with solitary nodule, Graves disease and metastatic cervical lymphadenopathy with occult primary were excluded from the study. Epi Info sample size calculator was used for the estimation of sample size. Taking confidence interval 95%, margin of error 8%, reported incidence of MNG 13% [7]. The final sample size came out to be 68. However, we have enrolled 70 patients in this study. Fine Needle Aspiration Cytology (FNAC) was performed only in cases with suspicious nodule (rapidly growing, hard & irregular nodule etc) which was detected during the clinical examination and on ultrasonography. All the patients under went total/near total thyroidectomy after all base line routine investigations along with thyroid function tests FNAC in selected patients and preoperative written and informed consent. In all cases the identification and preservation of the recurrent laryngeal nerves and Para thyroid glands during procedure was done and finally specimens sent for histopathological evaluation.

### 3. RESULTS

Out of total 70 patients with MNG, 11 (15.7%) cases were males while 59 (84.3%) were females. The age ranges in between 22 to 58 years with the mean age of 36.78 ±8.32 years. Most of the cases were in the 4th decade of life. Out of 70 cases, 17 (24.3%) cases were suspected of malignancy on clinical ground as...
rapidly growing, hard irregular nodule these patients were advised for U/S guided FNAC. Out of 17 suspicious cases, FNAc showed colloid goiter in 8 (47%) cases, follicular in 7 (41%) cases and papillary in 2 (12%) cases. These 17 patients under went for total thyroidectomy and final histopathology showed total 5 (29%) cases as malignant and remaining 12 (71%) cases were benign. Out of 5 malignant cases, 4 (80%) cases were papillary and 1 (20%) cases were follicular cell carcinoma. While other 53 (75.7%) cases under went for near total thyroidectomy and specimens sent for histopathology, among these only 1 (2%) case found as papillary cell carcinoma.

Among all 6 malignant cases 5 were females and one was male. 4 cases of Papillary cell Carcinoma and one case of Follicular cell Carcinoma in females while in male only one case found as malignant which was Papillary cell carcinoma. In females, two cases were seen in 3rd decade of life and 3 were in 4th decade while male was also in 4th decade. Clinically suspected cases were found to be significantly associated with final histopathology findings (p-value <0.001) whereas age (p-value 0.173) and gender (p-value 0.798) were found to be insignificant.

Table 1. Comparison of final histopathology findings with respect to baseline characteristics of the patients (n=70)

| Variables      | Follicular | Benign    | Papillary cells | p-value* |
|----------------|------------|-----------|-----------------|----------|
|                | n (%)      | n (%)     | n (%)           |          |
| Age (in years) |            |           |                 |          |
| ≤35            | 1 (100)    | 25 (38.5) | 3 (75)          | 0.173    |
| >35            | 0 (0)      | 40 (61.5) | 1 (25)          |          |
| Gender         |            |           |                 |          |
| Male           | 0 (0)      | 10 (15.4) | 1 (25)          | 0.798    |
| Female         | 1 (100)    | 55 (84.6) | 3 (75)          |          |
| Suspicious     |            |           |                 |          |
| Yes            | 1 (100)    | 12 (18.5) | 4 (100)         | <0.001   |
| No             | 0 (0)      | 53 (81.5) | 0 (0)           |          |

*chi-square test applied, p-value <0.05 was taken as significant
4. DISCUSSION

This study was conducted to determine the malignancy in patients with MNG. Previously, it was considered that the patients with MNG has a low risk of developing malignancy as compared 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, and the documented incidence of carcinoma in patients with MNG varies 2.92% to 29% [8,12,13].

Similarly, the finding of this study has reported considerably higher malignant cases in patients with MNG. Majority of the findings in our study are somewhat similar with the published studies. In particular, 80% of the malignant cases in our study were presented with papillary carcinoma. This finding is in accordance with a recent multicenter study from Pakistan (Nawabshah & Sukkur), in which 75% of the malignant cases were presented Papillary Carcinoma [14]. Another recent study has reported papillary thyroid cancer in 73.7% and follicular thyroid cancer in 26.3% patients [15]. Moreover, like previously published studies, mean age of the patients in our study also found similar with various studies [14,15]. In our study, female proportions found to be higher. This finding matched with the findings of Nadeem et al. [16] and Albasri et al. [17], who have reported considerably higher frequency of female patients. However, in contrast with our and above mentioned studies, Naqvi et al, in 2014 has reported higher frequency in males [14].

In our study FNAC was conducted in all suspicious cases with nodules. A number of studies have reported higher diagnostic accuracy of FNAC [17,18].

The finding of this study could be observed in the limitation that the sample size of our study was not much large. Secondly, the variables presence of sign and symptoms like swelling in the neck, hyperthyroidism, hypothyroidism, dyspnea, dysphagia, hoarseness of voice and cervical lymphadenopathy was not included in our study. In spite of these limitations, this study was a significant effort in determining findings from developing country like Pakistan.

5. CONCLUSION

In our study, Multinodular goiter is the most prevalent thyroid disease found in female. Follicular thyroid carcinoma is the most frequent cancer seen in this study. We suggest further studies with a larger population to validate our study.

CONSENT

As per international standard or university standard, patients’ written consent has been collected and preserved by the author.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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