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ORIGINAL ARTICLE

Incidental Findings of Papillary Carcinoma in Thyroid Observing patients of Previously Operated Clinical Specimens of Multinodular Goiter

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ABSTRACT

Background: Papillary carcinoma is one of the common malignancy among all thyroid malignancies and constitutes about 57-75%. In most of cases this lesion is an incidental finding in biopsies specimens operated for MNG. But the incidence of papillary carcinoma in the setting of various thyroid disorders including MNG remains unclear. Hence, we conducted a study of five years from 2017 till 2021 to address this question.
Aim: To rule out the incidence of Papillary Thyroid Carcinoma (PTC) especially associated connection with MNG
Methodology: From retrospective study carried out in the pathology department of Ibne-Sina Hospital, Multan, the date of 631 cases of thyroid carcinomas were retrieved. All the patients underwent different thyroid surgeries. Data regarding the age, gender, clinical diagnosis as well as pathological diagnosis was recorded and results were analyzed on SPSS 25.
Results: We reviewed 631 cases of thyroid and included in the analysis. Overall, n=558 cases were operated with clinical diagnosis of MNG. Among them, 54(10%) cases were reported as papillary carcinoma on the basis of histopathological examination.
Conclusions: Incidentally discovered papillary thyroid carcinomas are more commonly identified in surgical specimens from cases with MNG. These findings highlighted the high risk of malignancy in MNG emphasizing on the fact that the carcinoma should never be underestimated as majority of these patients were presented with clinically diagnosis of MNG.
Keywords: MNG, papillary thyroid carcinoma, malignancy

INTRODUCTION

Multi-nodular goiter (MNG) is emerging as common thyroid disorder with high incidence rate in south Punjab of Pakistan[1]. Mostly patients are being operated for it on the basis of clinical diagnosis of MNG but on histopathology, there are few areas of papillary carcinoma. Papillary carcinoma shows prevalence rate of 57-89%[2,3]. It shows female predominance with F:M=3:1 and this prevalence is increasing from last 30 years. Moreover according to WHO's (World Health Organization) histological categorization, Papillary Thyroid Carcinoma is classified as micronodular or macronodular. Micronodular papillary carcinoma is represented as well circumscribed tumor of 10mm in size[4]. It shows good prognosis with 90% survival rate[5]. Survival is dependent on histopathological subtype, age or therapeutic strategies[6].

This tumor is usually diagnosed on the basis of Ultra-Sonography and CT (Computerized Tomography). But these diagnostic tools show less sensitivity or specificity for Papillary carcinoma[7]. However, FNAC (Fine needle aspiration cytology) is more reliable or accurate tool to differentiate the tumor with minimal chance of false reporting as well as the selection of patients for surgical procedure[8-10].

Treatment modalities are dependent on site, size, nature, stage or grade of tumor[11]. Total thyroid resection is most reliable therapeutic option for MNG[12]. When patients are operated for clinically diagnosed cases of MNG, they showed incidental finding of Papillary carcinoma on the histopathology which is the most important or common malignancy of thyroid. PTC shows indolent response towards these therapeutic options with prompt propagation of the disease to adjacent LN (Lymph nodes) and tissues[13]. This metastasis towards the axial lymph nodes add stress on careful or vigilant diagnosis of every MNG case so that no PTC remains undiagnosed[14].

The main objective of this study is to rule out the incidence of Papillary Thyroid Carcinoma (PTC) especially associated connection with MNG (Multi-nodular Goiter).

METHODOLOGY

This retrospective study was carried out in the pathology department of Ibne-Sina Hospital, Multan after IRB permission. The data of 631 cases of thyroid carcinomas were retrieved in 2 years. All the patients underwent different thyroid surgeries. Paraffin embedded blocks of patients suffering from MNG and thyroid carcinoma reporting for the first time were included. Blocks of both genders were also included in present study.
Statistical Analysis: Data regarding the age, gender, clinical diagnosis as well as pathological diagnosis was recorded and results were analyzed on SPSS 25. A continuous variable like age was presented in the form of mean and standard deviation (S.D) while categorical variable like gender (nominal), tumor grades (ordinal), PD-L2 staining (ordinal) were presented in the form of frequency and percentage.

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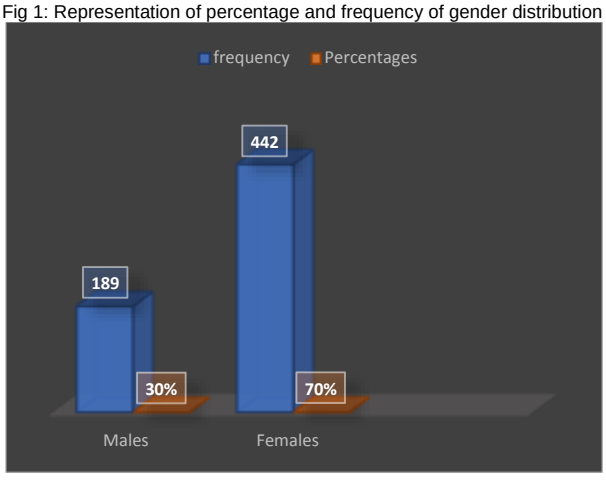
RESULTS

Gender: Out of total 631 patients, 442(70%) were females and 189(30%) were males as shown in figure 1. The papillary carcinoma was also common in females as compared to males with percentage of 85%.

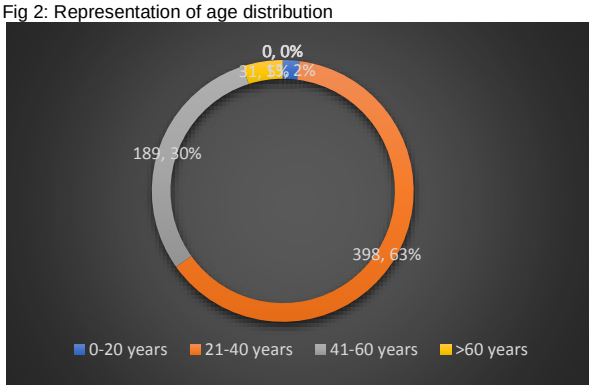
Fig 1: Representation of percentage and frequency of gender distribution



Age: A total number of 631 cases of thyroid tumors including both benign or malignant tumors were included in this study from Ibne-Sina Hospital, Multan. The overall age range varies from 13 - 68 years with the mean of 40 years. The data was categorized into

four different decades with difference of 20 years. 63% of affected patients were in 4th decade of life as shown in fig 2.

Fig 2: Representation of age distribution



Clinical and histopathological findings: Out of 631 cases of thyroid, there were 558 clinically diagnosed cases that were operated for multinodular goiter (MNG) while only 10 cases were of papillary carcinoma. When clinically diagnosed MNG cases underwent through histopathology then out of 558 specimens, 10% (n=54) of cases were reported as papillary carcinoma showing the incidental finding of MNG. Detailed clinical as well as histopathological findings were summarized in table 1 and 2.

Table 1: Frequency and percentage of clinically diagnosed cases

Clinical Diagnosis		
Diagnosis	**Frequency**	**Percentage**
Multinodular goiter	558	88.5%
Papillary carcinoma	10	1.6%
Other malignant tumor	16	2.5%
Other benign lesions	47	7.4%

Table 2: Frequency and percentage of histopathologically diagnosed cases

Histopathological diagnosis		
Diagnosis	**Frequency**	**%age**
Multinodular Goiter	504	80%
Incidental finding of Papillary carcinoma	54	8.5%
Papillary carcinoma	10	1.6%
Other malignant cases	16	2.5%
Other benign cases	47	7.4%

Fig 3: Multinodular goiter (A) Photograph showing variable sized follicles ranging from macrofollicle to microfollicle (HnE; 4X) (B) Follicles with abundant colloid (HnE,10X) (C) dilated follicles with flattened epithelium.

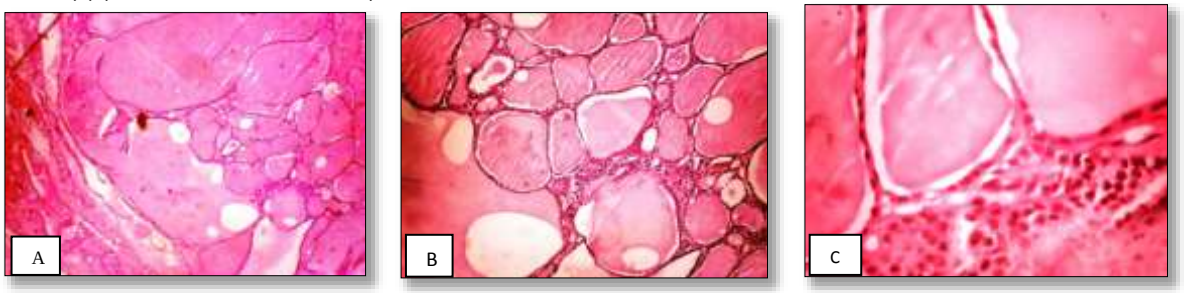
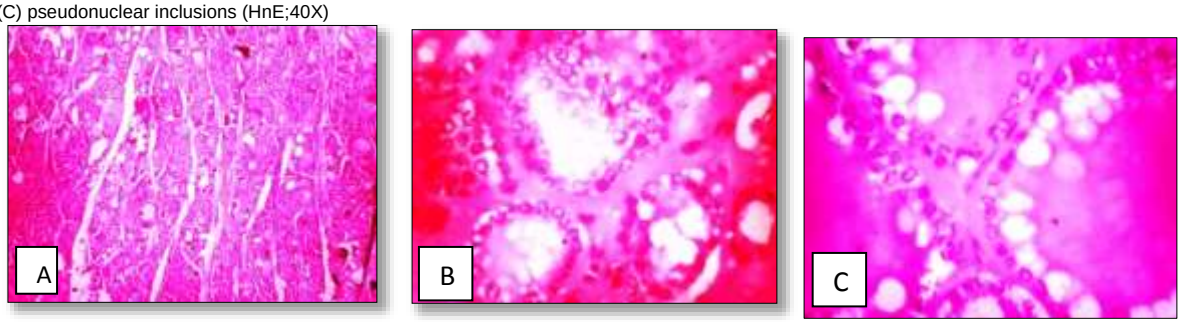


Fig 4: Papillary carcinoma in multinodular goiter (A) papillary carcinoma with eosin and hematoxylin stain (4X) (B) large prominent vesicular nuclei (HnE;10X) (C) pseudonuclear inclusions (HnE;40X)



DISCUSSION

Multinodular goiter causes (MNG) the thyroid enlargement with multiple nodular formation[15]. For many years, it was consider as benign lesion with less malignant potential. But now, this potential has been increased from 7% to 17%[16]. Papillary thyroid carcinoma (PTC) is the commonest incidental tumor that arise from the MNG with incidence rate of 20.7%[17]. PTC is the common endocrine malignant tumor arising from the follicular cells of the thyroid gland[18]. Race, gender, iodine deficiency or radioactive rays are the possible risk factors that are responsible for increase in tumor potential[16,19]. Patients presented with thyroid nodule are evaluated for thyroidectomy on the basis clinical history, fine needle aspiration cytology (FNAC) with or without ultrasound guidance[17]. But upon histopathological examination or immunohistopathological examination, the papillary carcinoma of thyroid was also reported as incidental finding along with MNG[20].

In current study, 63% of study population were observed with the mean age of 40 years showing that it is more common in adult age as compared to the younger ones. Many national and international authors also reported the same finding for age. Zahid et al reported the mean age of 36±10 years in his study in Azad Kashmir[20]. Ito and his fellows conduct a research in Japan and documented the age of 50years[18]. Similarly, the age of 43.51 years and 40.92±8.32 years was concluded by Naeem et al and Khalid et al respectively[16,17]. Age has been directly related to cancer development in certain cases as increasing age means cumulative exposure of the carcinogens which damage the cells to a critical point of no return leading to mutations that finally results in cancer[21].

According present study, females have more chances to develop the thyroid carcinoma including multinodular goiter and papillary carcinoma of thyroid. During pregnancy, the increase production of human chorionic gonadotrophic (HCG) in women stimulates the production thyroid stimulating hormone (TSH)

leading to cancer development might be the main reason that females are at high risk of developing thyroid carcinomas[22].

Multi nodular goiter is emerging as common disease of thyroid. Incidence of MNG is raised by 20% and become fourth common cancer globally[23]. Various factors are involved in this raise of incidence including early tumor detection, obesity, environmental factors i.e. radiations, chemicals[24], reproductive and gynecological issues[25]. In present study, the overall incidence of all malignant cases was observed as 12.6% on the basis of histopathological diagnosis. These findings are consistent with many national and international findings[25,26] but in contrast to the study of Beigh et al, which reported 72.34% of all the malignant cases of thyroid[27]. Papillary carcinoma of thyroid was reported as common malignant tumor of thyroid with 67.5% in current study. These results are similar with the study of Memon et al as they reported 60% of this carcinoma[28]. High incidence of papillary carcinoma among the MNG diagnosed patient emphasize on the need of more précised diagnostic tools for these tumors.

Limitations of study: Small group of population followed by limited financial and human resources added to our limitations.

CONCLUSION

Incidentally discovered papillary thyroid carcinomas are more commonly identified in specimens that are surgically operated with clinical diagnosis of MNG. Usually, the first diagnosis of papillary carcinoma is made when their metastasis in the cervical lymph nodes. These findings highlight the high risk of malignancy in MNG emphasizing on the fact that the carcinoma should never be underestimated and every case of MNG must be carefully diagnosed for papillary carcinomas.

Authorship and contribution Declaration: Each author of this article fulfilled following Criteria of Authorship:

IZ, AS & AH: Overall supervision and Write up and literature review.

AN, NF & AB: Literature review help in write-up.

All authors agree to be responsible for all aspects of their research work.

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