

# Histopathological Evaluation of 432 Cases of Goiter

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**Background:** Classically, multinodular goiter (MNG) has been considered to be a safer form of goiter with minimal risk of malignancy. However, recent literature advocates that prevalence of malignancies in solitary thyroid nodule (STN) and MNG is comparable.

**Objective:** To ascertain the frequency and pattern of malignancy in MNG and STN.

**Materials and Methods:** It was a prospective study conductive from Feb 2006 to Nov 2008 in histopathology department at Shaikh Zayed Hospital Lahore. In this period, 432 cases including 310 cases of MNG and 122 cases of STN who underwent thyroid surgery were studied. Histopathology was carried out following surgery in all these cases. Histological diagnosis in each case was analyzed.

**Results:** Among 310 cases of MNG, 12 (3.87%) were malignant and M:F was 2.53:1. Out of 122 cases of STN, 14 (11.47%) cases were found malignant with M:F of 1:1.76.

**Conclusion:** The prevalence of malignancy in STN is higher than that in MNG; however, multinodularity should no longer be considered as an indicator of benign disease. Surgical intervention should be considered in all cases of nodular goiter.

**Key Words:** Solitary Thyroid Nodule, Multinodular Goitre, Papillary Carcinoma.

## Introduction

Thyroid nodules are among the commonly encountered surgical specimens in histopathology laboratory. Thyroid nodules can be solitary or multiple. Carcinoma of thyroid is uncommon accounting for only 1% of all human tumors. Annual incidence of thyroid cancer is 0.5 to 10:100,000 person's world wide<sup>1</sup>. The prevalence of carcinoma is lower in multinodular goiter (MNG) than in solitary thyroid nodule (STN) (2). Malignancy is seen in only 0 to 11% of patients with MNG and is usually an incidental finding in thyroidectomy specimens, and in 3 to 33% of patients with STN<sup>3</sup>. Clinical assessment based on physical examination of thyroid nodule helps to distinguish cases having high risk of malignancy. Iodine uptake thyroid scan, ultrasonography of the gland and fine needle aspiration cytology (FNAC) can also play a significant role in establishing the preoperative diagnosis of malignancy, but FNAC is the modality of choice. One shortcoming of FNAC in MNG is false negative result because the needle may not go into the nodule on which the test needs to be done. However, its role in solitary nodule is well established. Help of ultrasound guidance for FNAC can be taken if the cell yield is poor on aspiration. STN is the most common indication for surgical resection as prevalence of malignancy is more in solitary nodules. However, the solitary nodules should be cold on thyroid scan because hot nodules are less likely to be malignant. Malignancy in thyroid is mostly seen in hypo functioning cold nodules which do not take up iodine. Men develop thyroid nodules less frequently than women. Another fact is that frequency of malignancy in STN is more common in men than in women. Solitary cold nodules in men should be thoroughly investigated. Malignant nodules need to be treated

surgically whereas benign nodules can be managed conservatively. Thyroid malignancy does not cause hypo or hyperthyroidism. Patients with thyroid malignancy usually reveal normal thyroid function tests. This study is aimed to see the histological pattern and ascertain the frequency and pattern of malignancy in goiter and STN in both sexes so that recommendations can be made for management.

## Materials and Methods

It was a prospective study conducted from Feb 2006 to Nov 2008 in histopathology department at Sheikh Zayed Hospital, Lahore and included a total of 432 cases. On clinical assessment and thyroid scan, these comprised of 310 cases of MNG and 122 cases of STN. The patients were segregated into two categories: STN and MNG. Those patients who had previously undergone thyroid surgery and patients showing inconclusive ultrasonic diagnosis about thyroid nodularity were excluded from this study. FNAC was done in all patients with STN. Department received different thyroid specimens including nodulectomy, lobectomy, total/near total or subtotal thyroidectomy, which were processed. H&E stained slides were made and in some cases, Congo Red stain was also carried out. Histological diagnosis was finalized.

## Results

Histopathological diagnosis of these cases was made according to WHO criteria<sup>4</sup>. Among the 432 cases, there were 122 cases of STN and 310 cases of MNG. Of 122 cases of STN, 102 (83.60%) were female and 20 (16.40%) were male. In 310 cases of MNG, there were 36 (11.61%) males and 274 (88.39%). Male to Female (M:F) ratio for MNG

and STN were 1.76 & 1: 5.1 respectively (Table 1). The patients with MNG ranged from 14 to 63 years (mean 37.7 ± 14.3) and those of STN ranged from 19 to 71 years (mean 34.7 + 14.2 years) (Table 2).

**Table 1:** Distribution of MNG & STN by Gender.

Morphology	Male (%)	Female (%)	M:F
MNG	36 (11.1%)	274 (88.39%)	1 : 7.6
STN	20 (16.4%)	102 (83.6%)	1 : 5.1

**Table 2:** Mean, Minimum & Maximum Age Range of MNG & STN.

Age in Years	Mean Age (± SD)	Minimum Age	Maximum Age	Age Range
MNG	37.7 (14.3)	14	63	49
STN	34.7 (14.2)	19	71	52

Out of 310 cases of MNG, 9 females (3.28%) and 3 males (8.33%) were found to have thyroid malignancy on histological examination. Among 122 cases of STN, 12 females (11.76%) and 2 males (10%) were diagnosed for thyroid malignancy (Table 3).

**Table 3:** Malignancy in MNG and STN.

Type	Gender	Total Cases	Malignant	Per-centage
MNG	Male	36	3	8.33
	Female	274	9	3.28
STN	Male	20	2	10
	Female	102	12	11.76

**Table 4:** Analysis of Malignancies in MNG.

Histological Diagnosis	Males	Females	Total
Papillary Carcinoma	2	4	06
Medullary Carcinoma	0	1	01
Anaplastic Carcinoma	0	1	01
Undifferentiated Malignant Neoplasms	1	3	04

Among the malignancies in MNG, there were 6 cases of papillary carcinoma, 1 of medullary carcinoma, 1 of anaplastic carcinoma and 4 cases of undifferentiated malignant neoplasms. The gender distribution is shown in Table 4.

Among the 14 malignancies in STN, 8 were papillary carcinoma, 2 were follicular carcinoma, 1 was medullary carcinoma and 3 were diagnosed as anaplastic carcinoma. The distribution among male and female patients is elaborated in Table 5.

**Table 5:** Analysis of Malignancies in STN.

Histological Diagnosis	Male	Female	Total
Papillary Carcinoma	2	6	8
Follicular Carcinoma	0	2	2
Medullary Carcinoma	0	1	1
Anaplastic Carcinoma	0	3	3

On analyzing patients according to sex, it is seen that females had lower incidence of cancer in MNG (3.28%) compared with solitary nodule (11.76%). The M:F for malignancy in MNG was 2.53:1 and for STN was 1:1.76.

**Discussion**

Although thyroid malignancy is relatively uncommon in thyroid nodules yet there was greater risk of thyroid malignancy in STN group (%) than in MNG group (%). The frequency of cancer in MNG group can be correlated with this study conducted by Tollin et al<sup>2</sup> to estimate the risk of malignancy in patients with MNG. In patients with STN, cancer occurred at the rate of 11.47% which can be correlated with observation of Wagana et al<sup>5</sup>, describing the risk of malignancy which was 16% in patients with STN. In one of the studies comparing the rate of malignancy in STN with MNG containing cold nodules, Sachmechi et al<sup>6</sup> stated a relatively greater risk of malignancy (9.8%) in patients with MNG than STN (8%). A greater prevalence of cancer was seen in STN (9.2%) when compared with MNG (6.3%) by Papini et al<sup>7</sup>. It is revealed in many studies that MNG containing nodules show same prevalence of cancer similar to STN<sup>8</sup>. Controversial issue is that malignancy in MNG has different prognosis than from STN<sup>9</sup>. In our study, the types of cancer were different in MNG and STN. This is contrary to observation made by Frates<sup>8</sup> who found that the types of malignant cases were similar among patients with MNG and STN. The reason could be that this is a hospital based study involving relatively limited number of patients. STN are seen in all age groups whereas MNG are seen more in increasing age group.<sup>10</sup> This study does not reveal any information about lymph node metastasis in thyroid cancer patients. While diagnosing malignancy in MNG it is believed by some authors that FNAC does not show a high sensitivity.<sup>11</sup> A false negative report can be given to patients with MNG because of sampling error. In this study, it was also observed that malignancy in MNG as compared with STN was seen in old age. Our study provides useful information about the frequency of cancer in MNG and STN.

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