Thyroid Carcinoma (Tc) in Nodular Goitre

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Objective: To study the incidence and pathology of thyroid malignancy in patients operated for presumably benign nodular thyroid disease (multi nodular goitre (MNG) & solitary thyroid nodule (STN)).

Methods: A total of 175 patients who underwent surgery for presumably benign nodular thyroid disease between January 2004 and March 2012 were studied, prospectively. These patients underwent hemi, subtotal, total thyroidectomy.

Results: 37 of the 175 patients (21%) had malignancy on final histopathological examination. The mean age of patients with benign disease was 46.4 years and that with malignancies was 50.6 years. Mean size of nodules was 4.28 +/- 1.48 cm in the benign group and 4.21 +/- 1.48 cm in the malignant group. All those with MNG, 14/14 (100%) were papillary carcinoma and those with STN, 22/23 (95.7%) were papillary carcinoma. Among the papillary carcinomas, follicular variant was 15 and the micropapillary variant was 3.

Conclusions: The incidence of malignancy in nodular goiter is higher than what is usually reported. There was no significant difference in incidence of malignancy between MNG and STN (P value: 0.262). Papillary carcinoma was significantly higher in nodular goiter (97.3%). Papillary carcinoma was found in all patients who presented with MNG and all but one who presented with STN. Follicular variant of papillary carcinoma was more common than the micropapillary variant (40.5% and 8.1% respectively).

Keywords: Nodular goitre; Thyroid carcinoma; Papillary carcinoma thyroid

Abbreviations: MNG: Multi-Nodular Goitre; STN: Solitary Thyroid Nodule; TC: Thyroid Carcinoma; FNAC: Fine Needle Aspiration Cytology; FNAB: Fine Needle Aspiration Biopsy

Background

The incidence of malignancy in MNG has been found to vary from 4% to 17% [1]. Thyroid carcinoma is a relatively rare tumour but represents the most frequent form of endocrine cancer [2]. In contradiction to earlier studies, the incidence of malignancy in STN is not significantly higher than MNG [3]. These studies alluded to the fact that the risk of malignancy in both MNG and STN is not negligible. Therefore, both conditions should be carefully evaluated to detect any underlying malignant foci, which may require further surgical intervention [4]. This case series aims to study the incidence and pathology of malignancy in patients operated for presumably benign nodular thyroid disease.

Patients and Methods

A total of 175 patients who underwent surgery for presumably benign nodular thyroid disease between January 2004 and March 2012 were studied, prospectively. These patients underwent hemi, subtotal, total thyroidectomy. Histopathology reports of these patients were compiled, analysed and studied. The age and size difference between benign and malignant nodular thyroid disease were analysed. The incidence of malignancy was separately studied for MNG and STN. The pathological variety of the malignancy in MNG and STN were studied. Chi square test was used to calculate the statistical significance.

Results

Of the 175 patients who were operated for presumably benign thyroid disease, 37 patients (21.1%) had malignancy reported on histopathology examination (Table 1).

Table 1: Thyroid carcinoma in nodular thyroid disease.

<table>
<thead>
<tr>
<th>PRE OP Diagnosis</th>
<th>No. of patients (%)</th>
<th>TC (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG</td>
<td>77 (44)</td>
<td>14 (37.8)</td>
<td>0.543</td>
</tr>
<tr>
<td>STN</td>
<td>98 (56)</td>
<td>23 (62.2)</td>
<td>0.262</td>
</tr>
<tr>
<td>TOTAL</td>
<td>175 (100)</td>
<td>37 (100)</td>
<td>-</td>
</tr>
</tbody>
</table>

The mean age of patients with nodular goitre was 47.4 years (SD: 15.05). Patients with benign goitres had a mean age of 46.4 years (SD: 15.21). The malignant goitres occur at an older age group, with a mean age of 50.6 years (SD: 15.36).

Among the 175 patients, 160 (91.4%) were female. 77 presented with MNG, of which 68 (88.3%) were female and 9 (11.7%) male. 12 of 68 females and 2 of the 9 males had TC. 98 patients presented as STN, of which 93 (93.9%) were female and 6 (6.1%) male. 22 of the 92 females and 1 of the 6 males had TC (Table 2).

Mean size of nodules was 4.28 +/- 1.48 cm in the benign group and 4.21 +/- 1.48 cm in the malignant group. There were no significant results observed.

Out of the 37 patients with thyroid carcinoma (TC), 23 (62.1%) presented as STN and 14 (37.9%) as MNG on clinical examination. The P value was 0.262 and was not significant.

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between incidence of thyroid carcinoma (TC) in patients with STN and MNG. Other studies have shown no significant difference observed that majority of patients with thyroid carcinoma in Pakistan TC was found in 18.8% patients with MNG. Waseem Memon [2] has reported with a percentage varying from 7-17% [1,10,11]. In our study malignancy was seen in 17% [10].The incidence of carcinoma in MNG in MNG was 13% and was not significantly different from STN in which study reported from Malaysia [1], 7.5% of patients with MNG had foci considered to be at lower risk of malignancy than those with STN. In a study in the size of the nodule in both groups (benign and malignant).

As demonstrated in our study, the mean age of patients with nodular goitre who had malignancy was slightly higher than those in the benign group. Similar observations were made by Hee Nee Pang and Chung Ming Chen in their study conducted at a tertiary care hospital in Singapore [4].

TC in nodular goitre was significantly higher in females in our study. This could be due to the higher incidence of nodular goitre in females compared to males. We did not find any significant difference in the size of the nodule in both groups (benign and malignant).

MNG is the commonest indication for thyroidectomy in endemic iodine deficient regions [2]. Traditionally, patients with MNG have been considered to be at lower risk of malignancy than those with STN. In a study reported from Malaysia [1], 7.5% of patients with MNG had foci of malignancy. In another study from USA, the incidence of carcinoma in MNG was 13% and was not significantly different from STN in which malignancy was seen in 17% [10]. The incidence of carcinoma in MNG is reported with a percentage varying from 7-17% [1,10,11]. In our study TC was found in 18.8% patients with MNG. Waseem Memon [2] has observed that majority of patients with thyroid carcinoma in Pakistan present as MNG. Other studies have shown no significant difference between incidence of thyroid carcinoma (TC) in patients with STN and MNG, as shown in post-operative histopathology examination [10,11]. Thus multinodularity does not seem to be certain indicative factor of benign disease.

Papillary carcinoma was found in 36 (97.1%) patients in our study, and only one with follicular carcinoma, who presented as STN. Among the malignancy group, all 14 patients who presented as MNG showed papillary carcinoma on histology. However, according to Bailey and Love, text book of surgery, 25th edition (chapter 48-page 778), “An increase in incidence of cancer (usually follicular) has been reported from endemic areas (iodine deficient MNG)”. Two recent studies from Nigeria have reported follicular carcinoma as the commonest thyroid disease [12,13]. In another study from Saudi Arabia, lymphoma was more frequent [9]. Follicular variant of papillary carcinoma is found more often than the micropapillary variant in our study.

In conclusion, thyroid malignancy in nodular goitre is not uncommon. This study has shown, a higher frequency of papillary than follicular carcinoma, although both may be associated. Thyroid carcinoma is more frequent in older age group irrespective of single or multiple nodules on clinical examination. In high percentage of patients, it is difficult to obtain FNAC from a malignant focus in nodular goitre. Hence, the surgical treatment for a nodular goitre may be near total instead of subtotal thyroideectomy.

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### Informed Consent

An informed consent was sought from all the patients who were included in the study. The methodology of the study was explained to the patients individually in a language of their understanding. The patients were also informed that the data collected from this study would be used for medical research and the material could be published, and the authors would take responsibility to protect the privacy of the patients. The format of the informed consent was approved by the institutional human ethics committee.

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### References


### Table 1:

<table>
<thead>
<tr>
<th>Goitre</th>
<th>Gender</th>
<th>Total (%)</th>
<th>Cancer (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG</td>
<td>Males</td>
<td>9 (11.7)</td>
<td>2 (14.3)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>68 (88.3)</td>
<td>12 (85.6)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>77 (100)</td>
<td>14 (100)</td>
</tr>
<tr>
<td>STN</td>
<td>Males</td>
<td>6 (6.1)</td>
<td>1 (4.3)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>92 (93.9)</td>
<td>22 (95.7)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>98 (100)</td>
<td>23 (100)</td>
</tr>
</tbody>
</table>

### Table 2: Gender distribution for TC in nodular thyroid disease.

<table>
<thead>
<tr>
<th>Papillary Carcinoma N (%)</th>
<th>Follicular Carcinoma N (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG</td>
<td>14 (100)</td>
<td>0</td>
</tr>
<tr>
<td>STN</td>
<td>22 (95.7)</td>
<td>1 (4.3)</td>
</tr>
</tbody>
</table>

### Table 3: Histopathology of TC in nodular thyroid disease.

Histopathology showed papillary carcinoma in all except in one patient (follicular carcinoma) who presented as STN (Table 3).

Follicular variant of papillary carcinoma was more common than the micropapillary variant (15/37 and 3/37 respectively).

