

Multinodular Goiter as a risk factor of Thyroid Carcinoma at Mosul city

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Abstract

Thyroid carcinoma (TC) is a relatively rare tumour, but it represents the most frequent form of cancer of the endocrine glands. Epidemiologically ascertained risk factors are ionizing radiation, the presence of thyroid adenoma, multinodular goiter (MNG) and family history of thyroid cancer, and personal history of goiter or thyroid nodule. We conducted the study to ascertain multinodularity of goiter should no longer be considered an indicator of probable benign disease. A cases series study was performed on patients operated of MNG at the Unit of surgery in AL jumhoory Teaching Hospital, AL Salam Teaching Hospital and at AL Zahrawy private Hospital (Mosul) from 1st May 2007 to 1st June 2011. The results of this study, demonstrate that in 18.3 % of the patients operated for MNG, the presence of a carcinoma was noticed in the definitive histopathological examination. Such incidence percentage of MNG is in accordance with the data reported in published reports. Thus, the authors conclude that the risk of malignancy in MNG has not to be underestimated (chi square test not significant at p value < 0.05), and that a dominant nodule in MNG should be valued as if it were a solitary nodule in an otherwise normal gland.

Key words: Thyroid lesion, thyroid carcinoma, multinodular goiter.

Introduction

Thyroid carcinoma (TC) is a relatively rare tumour, but it represents the most frequent form of cancer of the endocrine glands. It represents 1% of human neoplasias and its annual incidence is estimated worldwide from 0.5 to 10: 100.000 subjects in the world population (1). According to other studies the commonest cause of thyroid enlargement is multinodular goiter followed by thyroid tumours(2,3). The annual incidence of thyroid cancer varies considerably in different registries and is

increasing in some European countries, USA and Canada(4). Such incidence is increased if cases of occult carcinoma are taken into consideration. This occult carcinoma is a non evident neoplasia, occurring with cervical nodal disease, or accidentally detected in a thyroid that has been removed for pathology or during an autopsy (5). Epidemiologically ascertained risk factors are ionizing radiation, the presence of thyroid adenoma and multinodular goiter (MNG), family history of thyroid cancer,

and personal history of goiter or thyroid nodule(6), changing levels of iodine nutrition and increased pathologic diagnosis of clinically unimportant thyroid neoplasia have all been proposed as explanations for a world wide rise in the incidence of thyroid carcinoma over the past six decades (1,7-14). In published reports, the incidence of carcinoma in MNG is reported with a percentage that varies from 7% to 17% (15-22). Furthermore, it seems that there is no statistically significant difference between the incidence of TC in patients with a solitary nodule, as shown in the post-operation histopathological exam, and those with MNG (19,20,23). Thus, multinodularity does not seem to be a certain indicative factor of benign disease (18, 21, 22). The aim of the study is to carry out retrospective analysis of patients who have been operated for normal or hyperfunctioning MNG, in order to establish the incidence of the histopathological documented carcinoma or of the occult carcinoma found only after a complete histopathological examination of the operated thyroid or whose clinical revealing occurred with the discovery of cervical node disease during the follow up.

Materials and Methods

Retrospective analysis of case records of 557(134 male) patients who have undergone different types of thyroid surgeries for normal function or hyperfunctioning thyroid MNG, has been conducted at surgery unit in AL jumhoory Teaching Hospital, AL Salam Teaching Hospital and at AL Zahrawy private Hospital (Mosul) from 1st May 2007 to 1st June 2011. The medical records of these patients were reviewed

for demographic data, all information, including preoperative evaluation, types of carcinoma, tumour size, tumor histological features, presence of occult carcinoma, laboratory examinations, types of operations and post- operation therapy, were confirmed in the patients' records.

During preoperative evaluation, for all of the cases a thyroid ultrasonography, FNAC and TFT were performed, while a scintigraphy was never performed, since it has a low specificity and sensitivity in detecting thyroid cancer. In all the cases of multinodular nodules a total thyroidectomy was performed following the isolation and the preservation of the recurrent laryngeal nerves and of the parathyroid glands.

Data entry and analysis were done using Microsoft Office Excel 2007. Pearson's χ^2 -test was used for statistical testing. A p-value of <0.05 was considered significant.

Results

In this study, 557 operations performed for thyroid lesions (TL) in the period from 1st May 2007 to 1st June 2011 at the Unit of surgery in AL jumhoory Teaching Hospital, AL Salam Teaching Hospital and at AL Zahrawy private Hospital (Mosul), the presence of MNG was found in 389 cases (70%) (Table 1). The total number of carcinoma cases was 100 (68 papillary cancers, 15 follicular cancers, 7 medullary cancers, 5 anaplastic cancers and 5 lymphoma).

These 71 patients were 17 males and 54 females, 28 aged over 45 yrs, 24 aged 35-<45 yrs, 15 aged 25-<35 yrs and only 4 aged <25 yrs.

In 55 cases a near total thyroidectomy was performed while 9 cases Sub TT, 4 cases TT, 2 cases TT+MND and one

case by Lobectomy + IST was done. At the definitive histopathological examination, 54 cases of papillary cancer, 6 medullary, 5 anaplastic cancers, 5 lymphoma and 1 follicular cancer were reported (Table 2).

In the 389 cases of MNG, 71 cases of carcinoma were found (18.3%). Hence, the incidence of occult carcinoma for the 389 cases of MNG was 10.3% (40 cases). The 71 MNG carcinomas were smaller than 2 cm in 38 cases, while in 33 it was bigger than 2 cm. In 22 cases bigger than 2 cm and 33 cases smaller than 2 cm, post-operation radioiodine therapy have been carried out to patients with papillary and follicular carcinoma only, while post- operation thyroxin therapy was applied to all cases.

Discussion

Traditionally patients with MNG have been considered less at risk of malignancy than those with single nodule. However, published reports show that the incidence of malignant tumours in patients with single nodule does not differ from those with MNG (19, 20, 22). MNG is a risk factor for epidemiologically ascertained TC (1). In fact, the induction of TC following a diet lacking in iodine, was demonstrated in mice and a confirmation is given by the reduction of the mortality rate for TC registered in Switzerland following the supplement of iodine in table salt (24). Epidemiological studies have demonstrated how the incidence of carcinoma in patients with MNG is higher than the incidence of the general population (25, 26). This study documents marked increases in the incidence of thyroid cancer among study group, for (18.3%) of the patients

operated for MNG (chi square test not significant at p value < 0.05), during the definitive histopathological examination, a pattern of MNG associated to carcinoma was evidenced. The presentation of some of the thyroid cancers occurring in Mosul are considered to be atypical, suggesting that they may be radiogenic and iodine deficiency. In published reports, the incidence of carcinoma in MNG is reported with a percentage that varies from 7% to 17% (15-22). In accordance with published works, the histopathological type of carcinoma more frequently associated with MNG was shown to be the papillary (76%) (26). Among the instrumental exams to diagnose the malignancy of a thyroid nodule, ultrasound and scintigraphy help in raising a suspect; however, the most efficient method is the FNAC (27). Nevertheless, even if the pre-operative FNAC is negative, it does not exclude with certainty the possibility of a carcinoma, especially in MNG where the error in sampling the right area is greater. In fact, an incidence of 10.3% of occult carcinoma was evidenced in cases operated for MNG. Such evaluation error may lead to the performance of a non radical operation, and thus, to the need of a second operation or radiotherapy. In all cases of treated goiter, a total thyroidectomy was performed. Such radical treatment in case of carcinoma guarantees an oncological radicality, and allows to evidence eventual local or distant metastases. The post- operative radioiodine therapy has been carried out in 22 cases the carcinoma was bigger than 2 cm and in 33 cases smaller than 2 cm.

Conclusion; In conclusion, the risk of malignancy in MNG has not to be

underestimated, and a dominant nodule in MNG should be valued as if it were a single nodule in an otherwise normal gland.

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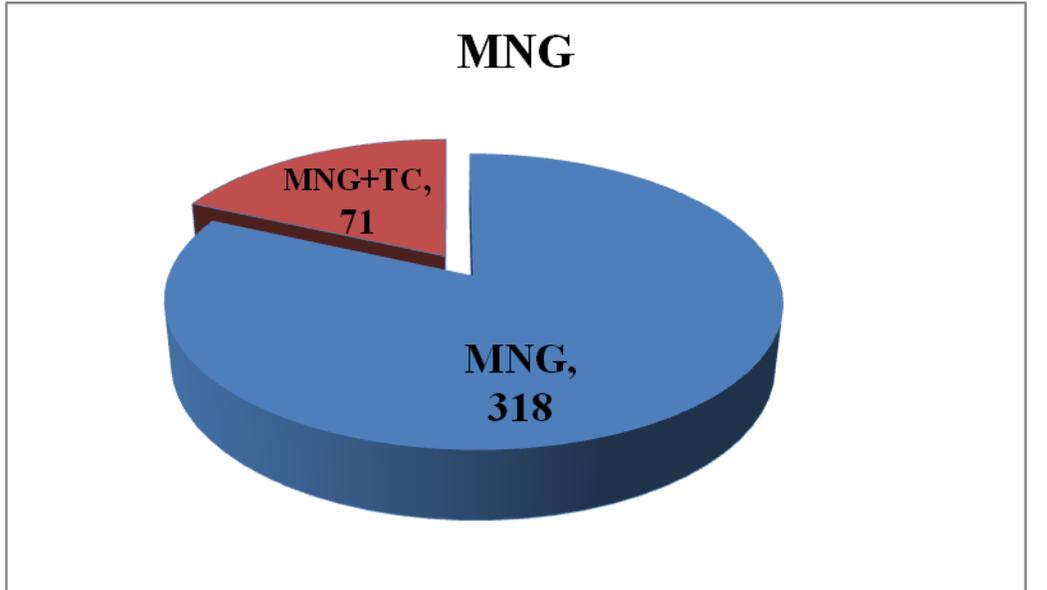


Figure 1. Cases of thyroid carcinoma in MNG.

Table 1 The type of carcinoma and MNG in Cases with thyroid lesions.

Operated TL	MNG	%
557	389	70
Types of carcinoma		
Papillary	68	
Follicular	15	
Medullary	7	
Anaplastic	5	
Lymphoma	5	
Total No.	100	

Table 2. Histopathological types of carcinoma.

Types of carcinoma	Number	%
Papillary	54	76
Medullary	6	8.5
Anaplastic	5	7
Lymphoma	5	7
Follicular	1	1.5
Total	71	

Table 3. Size of carcinoma in the total & MNG cases.

Size of carcinoma	<2cm		>2cm	
	No.	MNG	No.	MNG
	61	38	39	33

الغدة الدرقية متعدّدة العقد كعامل خطر في حدوث السرطان الدرقي في مدينة الموصل

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الخلاصة

سرطان الغدة الدرقية نادر نسبياً، لكنه يمثل الشكل الأكثر شيوعاً لسرطان الغدد الصماء. وبأثنا عوامل الخطر المؤكدة هي الإشعاع المؤين، ووجود أورام الغدة الدرقية والغدة الدرقية متعدّدة العقد، التاريخ العائلي للسرطان الدرقي، وتاريخ شخصي بوجود الغدة الدرقية أو العجيرة الدرقية. أجرينا الدراسة للتّحقيق بأن الغدة الدرقية متعدّدة العقد لم تعد تعتبر مؤشراً على احتمال ان المرض حميد. وأجرى تحليل ذو أثر رجعي على المرضى ممن لديهم الغدة الدرقية متعدّدة العقد، في وحدة الجراحة في المستشفى الجمهوري التعليمي، مستشفى السلام التعليمي، وفي مستشفى الزاهراوي الخاص من أيار ٢٠٠٧ إلى ١ حزيران ٢٠١١، بهدف معرفة نسبة حدوث الإصابة بسرطان الغدة الدرقية. نتائج هذه الدراسة أثبتت أن ١٨.٣% من المرضى اللذين اجريت لهم جراحة للغدة الدرقية متعدّدة العقد، لوحظ وجود السرطان في فحص الشريحة النسيجية المرضية. يستنتج المؤلفين بأن خطر الخبيث في عجيرة مهيمنة في الغدة الدرقية متعدّدة العقد يجب أن تُقيّم كما لو أنّ هي كانت عجيرة إنفرادية في الغدة الدرقية، [إختبار مربع كاي ليس هام عندما تكون قيمة $P > 0.05$].