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## Multinodular goitre – when should we operate?

### Wole wieloguzkowe – kiedy operować?

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#### Key words

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#### Słowa kluczowe

wole wieloguzkowe, rak tarczycy, analiza histopatologiczna, mikrorak tarczycy

#### Summary

**Introduction.** Thyroid operation is one of the most frequently performed in the Surgical Ward of the Specialist Municipal Hospital in Toruń. In the period from April 2002 to May 2008, 873 thyroid operations were performed. The most common indication for surgery was non-toxic goitre. Amongst other indications, some patients were operated on because of cancer of the thyroid. Cancer of the thyroid was also diagnosed in patients who were not initially qualified for this reason for an operation. Cancer of the thyroid is the fifth most frequently occurring neoplasm in Poland. The multitude of histopathological forms of this neoplasm means that unequivocal pre-operative diagnosis can be difficult. There are, it is true, certain characteristic traits of neoplastic nodules in an ultrasound scan, but they refer to papillary thyroid cancer. Biopsy by fine needle aspiration (FNA), even guided by ultrasound, is not a 100% accurate diagnostic method. In operations initially qualified as nodular goitre, 5.3% were histopathologically diagnosed as thyroid cancer. In this regard, would it not be advisable to recognise strumectomy as a preventive method in the case of nodular goitre, making it possible to detect and treat early stages of thyroid cancer? Based on material presented in this paper, the broadening of indications for strumectomy to include this important aspect should be considered.

**Aim.** To demonstrate the appropriateness of early thyroid resection in every case of multinodular thyroid goitre.

**Material and methods.** 873 patients operated in Municipal Hospital In Toruń on between 2002 and 2008 were included in the research. Patients have been operated and excised biological material subjected to histopathological.

**Results.** Thyroid cancers in the final histopathological analysis represented 7.03% of all those operated on. In the analysis of patients referred with a diagnosis of thyroid cancer (5.5% of all those operated on), the histopathological diagnosis was not confirmed in 1.71% of all those operated on (which represents 31.25% of patients referred with a diagnosis of thyroid cancer). Amongst patients referred with a diagnosis of goitre (94.27% of all those operated on), thyroid cancer was diagnosed in 4.98% (4.69% of the whole group of those operated on). The number of thyroid cancers found incidentally in the whole group of patients operated on was 4.69%, which represents 56.16% of all diagnosed thyroid cancers (32.88% of diagnoses were of microcarcinoma).

**Conclusions.** The analysis of the above results, particularly the over 56% of the cancers found incidentally and confirmed histopathologically from among all the diagnoses of thyroid cancer, would seem to allow us to claim that every multinodular goitre should be operated on early.

#### Streszczenie

**Wstęp.** Operacja tarczycy jest jedną z najczęściej wykonywanych w chirurgii endokrynologicznej. W Oddziale Chirurgicznym Specjalistycznego Szpitala Miejskiego w Toruniu, w okresie od kwietnia 2002 do maja 2008 wykonano 873 operacje tarczycy. Najczęstszym wskazaniem do leczenia operacyjnego było wole guzowate obojętne. Wśród innych wskazań część pacjentów była operowana również z powodu raka tarczycy. Rak tarczycy był także rozpoznawany u chorych pierwotnie niekwalifikowanych z tego powodu do operacji. Rak tarczycy jest piątym co do częstości występowania nowotworem w Polsce. Mnogość postaci histopatologicznych tego nowotworu sprawia, że jednoznaczne rozpoznanie

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przedoperacyjne bywa trudne. Istnieją, co prawda, pewne charakterystyczne cechy guzków nowotworowych w obrazie USG, dotyczą one jednak raka brodawkowatego tarczycy. Biopsja aspiracyjna cienkoigłowa (BAC), nawet celowana pod kontrolą USG, też nie jest metodą diagnostyczną o 100% czułości. W operacjach pierwotnie zakwalifikowanych jako wole guzowate w 5,3% rozpoznano histopatologicznie raka tarczycy. Czy w aspekcie tego nie należałoby uznać strumektomii w przypadku wola guzowatego za metodę prewencyjną, pozwalającą wykryć i wyleczyć wczesne stadia rozwoju raka tarczycy? W oparciu o materiał prezentowany w tej pracy można rozważyć poszerzenie wskazań do strumektomii o ten, jakże istotny aspekt.

**Cel pracy.** Wykazanie zasadności wczesnej resekcji tarczycy w każdym przypadku wola wieloguzkowego tarczycy.

**Materiał i metody.** Do badania włączono 873 chorych operowanych w Szpitalu Miejskim w Toruniu w latach 2002-2008. Pacjenci byli poddani resekcji tarczycy a usunięty materiał biologiczny poddano badaniu i analizie histopatologicznej.

**Wyniki.** Raki tarczycy w końcowej analizie histopatologicznej stanowiły 7,03% wszystkich operowanych. Analizując pacjentów skierowanych z rozpoznaniem raka tarczycy (5,5% wszystkich operowanych) rozpoznanie histopatologiczne nie potwierdziło się u 1,71% wszystkich operowanych (co stanowi 31,25% pacjentów kierowanych z rozpoznaniem raka tarczycy). Wśród pacjentów kierowanych z rozpoznaniem wola (94,27% wszystkich operowanych), u 4,98% rozpoznano raka tarczycy (4,69% całej operowanej grupy). Ilość raków tarczycy przypadkowo wykrytych w całej grupie operowanych pacjentów wynosiła 4,69%, co stanowi 56,16% wszystkich rozpoznanych raków tarczycy (32,88% rozpoznań stanowiła *microcarcinoma*).

**Wnioski.** Analiza powyższych wyników, szczególnie ponad 56% przypadkowo wykrytych, histopatologicznie potwierdzonych raków wśród wszystkich rozpoznań z rakiem tarczycy wydaje się pozwalać na twierdzenie, że należy wcześniej operować każde wole wieloguzkowe.

## INTRODUCTION

Multinodular goitre of the thyroid is an enlargement of the thyroid caused by a growth of the follicular epithelium, secreting autonomous hormones. Treatment of multinodular goitre is based on the elimination of nodular tissue by strumectomy.

Thyroid operation is one of the most commonly performed in the Surgical Ward of the Specialist Municipal Hospital in Toruń. Between April 2002 and May 2008, 873 thyroid operations were performed. The most frequent indication for surgery was non-toxic goitre. Among other indications, some of the patients were operated on due to thyroid cancer. Thyroid cancer was also diagnosed in patients who were not initially qualified for that reason for an operation. Thyroid cancer is the fifth most frequently occurring neoplasm in Poland. The multitude of histopathological forms of this neoplasm means that unequivocal pre-operative diagnosis can be difficult. There are, it is true, certain characteristics of neoplastic nodules in an ultrasound scan, but they refer to papillary cancer of the thyroid. Biopsy by fine needle aspiration (BAC), even guided by ultrasound, is not a 100% accurate diagnostic method. In operations initially qualified as nodular goitre, 5.3% were histopathologically diagnosed as thyroid cancer.

In this regard, would it not be advisable to recognise strumectomy as a preventive method in the case of nodular goitre – making it possible to detect and treat early stages of thyroid cancer? Based on material presented in this paper, the broadening of indications for strumectomy to include this important aspect should be considered.

## AIM

To demonstrate the appropriateness of early thyroid resection in every case of multinodular thyroid goitre.

## MATERIAL AND METHODS

During this research, retrospective analysis was used, encompassing 873 patients operated on in the years 2002 (from 1.04) to 2008 (30.05), on whom resection of the thyroid was performed. Pre- and post-operative diagnoses were analysed and evaluated for conformability and the number of thyroid cancers detected post-operatively, including micro-Ca.

The patients were referred to the Surgical Ward from the Endocrinological Clinic with an initial diagnosis on the basis of clinical tests, laboratory tests, ultrasound of the thyroid and biopsy by fine needle aspiration. All patients underwent a lung x-ray. All patients had a consultation with a laryngologist, in accordance with the recommendations of the Polish Group for Endocrinal Neoplasms concerning diagnosis and treatment of thyroid neoplasms established on the basis of The American Thyroid Association Guidelines Taskforce: Management guidelines for patients with thyroid nodules and differentiated thyroid cancer (1).

In the group of 873 patients referred to the Ward were 766 women and 107 men. The average age of the women was 49.5, and of the men 47.7 (tab. 1).

## RESULTS

Among 873 patients referred to the Ward, 823 people had an initial diagnosis of thyroid goitre, 48 patients were referred with a diagnosis of thyroid cancer (tab. 2).

Thyroid cancers in the final histopathological analysis constituted 7.03% (73 people) of all patients operated on.

Among patients referred with a diagnosis of thyroid cancer, a positive result was confirmed histopatholog-

ically ultimately in only 68.75%, which represents 31.25% false positive results in this group (in 15 patients, the initial diagnosis was not confirmed after the histopathological examination).

In contrast, among patients referred with a diagnosis of thyroid goitre, as many as 4.98% were also diagnosed with thyroid cancer.

The number of thyroid cancers **found incidentally** in the whole group of patients operated on was 4.69%, while in relation to the total number of diagnosed cancers the **percentage of thyroid cancers found incidentally was 56.16%**. Among all of the diagnosed thyroid cancers as many as **32.89% were microcarcinoma (nodules with a diameter below 1 cm)** (tab.3).

## DISCUSSION

In the present paper, we have demonstrated the surprisingly high percentage of thyroid cancers found incidentally in relation to the total number of cancers diagnosed in the group of patients operated on. Equally high is the percentage of microcarcinoma, i.e. nodules with a diameter below 1 cm, found incidentally. These results correlate with the number of falsely positive ini-

tial diagnoses with which the patients were referred for a thyroidectomy (6).

The aim of surgery in thyroid diseases should be to eliminate the disease with the fewest possible complications and to avoid re-operation (2, 11). Re-operation is performed when cancer is detected in the post-operative histopathological examination or in the case of recurring goitre, detected during remote post-operative observation. Re-operation is unfortunately linked with a far higher percentage of complications.

Multinodular goitre is the most frequent indication for thyroidectomy and this is the best way to treat this disease, which was proved by Teodor Kocher (Nobel Prize in 1909). However, in the light of the results obtained in this paper, it seems necessary to bring forward the thyroidectomy and to cut the amount of time between the discovery of the goitre and its removal, with the aim of minimising the risk of thyroid cancer developing.

We believe that it is vital to perform mid-operation histopathological examination much more frequently, particularly in patients referred with a diagnosis of thyroid cancer, in order to avoid re-operation and exposure of the patient to any post-operative complications which are much harder to avoid during re-operation (7).

**Table 1.** Compilation of patients' age groups.

Patients referred for surgical treatment of goiter	2002	2003	2004	2005	2006	2007	2008	Total
Patients referred with a diagnosis of thyroid goitre	109	127	154	120	131	133	49	823
In histopathological examination cancer diagnosed instead of goitre	2/1 microCa	6/4 microCa	10/6 microCa	8/5 microCa	6/4 microCa	7/3 microCa	2/1 microCa	41/24 microCa
Patients referred with diagnosis of thyroid cancer	13	11	4	8	7	4	1	48
In histopathological examination cancer not confirmed	1	2	2	4	2	3	1	15
All diagnosed thyroid cancers	14	15	12	12	10	8	2	73
All those operated on	122	138	158	129	139	137	50	873

**Table 2.** Compilation of diagnoses.

All groups of patients	No. of people	Youngest patient (years)	Oldest patient (years)	Average age (years)
All patients	873 people	16	89	46.02
Women	766 people	16	89	49.51
Men	107 people	16	75	47.77
Women with post-operatively diagnosed Ca	60 people	21	81	51.85
Men with post-operatively diagnosed Ca	13 people	31	65	54.94

**Table 3.** Compilation of diagnosed cancers.

Patients with different types of cancers and MGB	2002	2003	2004	2005	2006	2007	2008	Total
Patients referred with M G-B	10	3	6	3	4	1	0	27
Cancer in histopathological examination in patient with MGB	0	0	1	0	0	0	0	1
<i>Ca papillare</i> in histopathological examination	12	12	10	10	10	6	2	62
<i>Ca folliculare</i> in histopathological examination	0	0	2	1	0	1	0	4
<i>Ca medullare</i> in histopathological examination	2	1	0	0	0	0	0	3
<i>Ca insulare</i> in histopathological examination	0	1	0	1	0	0	0	2
<i>Ca Hurlta (oxyphillicum)</i> in histopathological examination	0	1	0	0	0	0	0	1
<i>Ca metastaticum</i> in histopathological examination	0	0	0	0	0	1	0	1

It also seems obvious why a large percentage of diagnoses of postoperative histopathology preparations does not coincide with preoperative biopsy. The explanation may be inability to perform the biopsy just to place the development of cancerous cells in the thyroid gland in a small part of all the changes detected in the multinodular goiter (12).

In this report, the percentage of cancers found incidentally correlates with our previous research (3) and with the results obtained by Giles et al. (2). However, all of the results obtained by us are so surprising and serious in their consequences that they should be treated as preliminary results requiring further research in order to confirm the results on a considerably larger group of patients by other authors.

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#### CONCLUSIONS

1. 31.25% of false positive results confirms the necessity of performing mid-operation histopathological examination, particularly in patients referred with a diagnosis of thyroid cancer.
2. 56.16% of thyroid cancers found incidentally after the operation, in relation to the total number of diagnosed cancers (including 32.9% micro-Ca) would seem to allow us to claim that every multinodular goitre should be operated on considerably earlier.
3. The results obtained in this paper are surprising and serious in their consequences, in which regard they require further research in order to confirm the results on a considerably larger group of patients (results are statistically significant).

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