

Surgical treatment of differentiated microcarcinomas of the thyroid

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Abstract. – Thyroid microcarcinomas (TMC) are histologically malignant diseases, despite their limited dimensions and non-aggressive behaviour; frequent multifocality of the disease and local recurrence is really possible after conservative resection.

Modern therapeutic approaches to thyroid microcarcinoma include both radical surgical treatment, influenced by the frequent locoregional diffusion of TMC, consisting of a total thyroidectomy with an eventual central and/or functional unilateral lymphadenectomy, depending on the clinical evidence of lymph node metastases and conservative treatment based on more limited resections which take into account the slow clinical progression of this type of tumour.

The aim of our work is to examine the therapeutic guidelines for surgical treatment of TMC which, in our experience, are closely dependent on clinical presentation type.

From 1991 to 2000, more than 400 patients with thyroid disease were referred to the Department of Surgical Science and Applied Medical Technologies "F. Durante". Threehundred-seventythree patients received surgical treatment: in 311 patients a benign disease was diagnosed, while in 62 neoplasia was present. In total we observed 30 TMC, consisting of 28 papillary and 2 follicular microcarcinomas. On the basis of clinical presentation we divided patients in three groups:

- A – patients with a clinically suspicious neoplastic lesion before surgical treatment;
- B – patients in whom histological diagnosis of cancer was "incidental" after an operation performed for benign disease;
- C – patients in whom a neck lymph node metastases were clinically found before diagnosis of an "occult" papillary carcinoma in the thyroid gland.

27 total thyroidectomies and 3 conservative resections, that required successive total exeresis, were performed. In 5 cases a central neck lymph node dissection was carried out and in 5 + 1 cases functional modified lateral neck dissections was deemed necessary.

Our data suggest that an evaluation of tumor's malignancy cannot be carried out on the basis of its dimensions alone. Indeed, biological aggressivity, whether local or at a distance, is a prerogative of both large and small tumours. Therefore a microcarcinoma must be considered a full-blown form of thyroid cancer and as such must be treated.

Total thyroidectomy may be followed by identification of possible local metastases. "Whole body" scintigraphy allows to identify and treat with radioiodine therapy, possible recurrent lesions. Therefore in conclusion, total resection is not only a useful, but also a necessary treatment for the correct diagnostic and therapeutic follow-up of these patients.

Key Words:

Thyroid microcarcinoma, Thyroid cancer, Differentiated microcarcinoma of the thyroid.

Introduction

Thyroid microcarcinoma (TMC) is defined by the World Health Organization as a carcinoma 1.0 cm or less in its maximum diameter (1987)¹.

In the last few years there has been a considerable increase in the incidence of these tumours, especially in patients with thyroid apparently non-neoplastic surgical diseases, and indeed the prevalence rate of TMC reaches values of 45% in differentiated thyroid neoplasms^{2,3,6}.

TMC is histologically malignant, with recurrent lymph nodes and frequent multifocality with local recurrence after partial resection, despite its limited dimensions and a low degree of aggressive behaviour; distant metastasis is rare. Papillary microcarcinoma

is the most frequent histological type. Patients with TMC have favourable long-term prospects of survival^{3,7-9}.

Today the prevalent therapeutic approaches include:

- 1) radical surgical treatment, for frequent multifocality of TMC, consisting in total thyroidectomy and facultative lymphadenectomy,
- 2) conservative surgical treatment with more limited resections for the relatively slow clinical progression of these tumours.

The aim of our work is to examine the therapeutic guidelines for the surgical treatment of TMC which is strictly dependent on the type of clinical presentation.

Materials and Methods

Between 1991 and 2000 more than 400 patients with thyroid disease were studied in the Department of Surgical Sciences and Applied Medical Technologies "Francesco Durante", University "La Sapienza" of Rome. Threehundred-seventythree patients received surgical treatment. In 311 cases a benign thyroid pathology was present, while in 62 cases neoplasia was identified (Table I).

Age range of the 62 patients with neoplastic disease was 21-82 years and mean age 48 years. Prevalance rate was higher in females (49) than in males (13) with male:female ratio 3,7:1.

Preoperative studies included: haematological routine examination and the study of thyroid function (TSH, FT3, FT4, TG, antibodies anti TG, calcitonin), chest and tracheal x-rays, study of vocal chord mobility, ECG and cardiological consultation, ultrasounds, echocolor Doppler, thyroid scintigraphy with Tc 99, I 131, FNAB when indicated, anaesthesiological consultation.

We observed 30 TMC, 28 papillary and 2 follicular microcarcinomas; the patient population consisted of 26 women and 4 men. Twentythree patients presented a state of normal thyroid function while in 7 cases hyperthyroidism was present.

On the basis of clinical presentation we divided the patients in three groups: (Table II)

- A – patients with a clinically suspicious neoplastic lesion diagnosed before surgical treatment;
- B – patients in whom the histological diagnosis of cancer was "incidental" after an operation performed for benign disease;
- C – patients in whom a neck lymph node metastases were clinically found before diagnosis of an "occult" papillary carcinoma in thyroid gland.

Results

Group A consisted of 11 patients; in 10 of these a preoperative fine needle biopsy was performed and confirmed cancer diagnosis. In 3 cases lymph nodes were enlarged. Histological diagnosis was "papillary TMC" in all cases; 2 patients had multicentric tumours and 2 patients had locoregional lymph node metastases. Surgical treatment consisted of total thyroidectomy in 10 patients and a conservative resection with isthmectomy in 1 patient. A central neck dissection with homolateral functional modified lymph node dissection was performed in 3 patients who revealed preoperative evidence of lymph node diffusion. In one patient a lateral lymph node dissection was performed on a subsequent period.

Of the 17 patients in group B surgically treated for benign disease (multinodular goiter, FAN, Graves disease), in 15 cases a diag-

Table I. Patients with thyroid disease subjected to surgical treatment 373 (aa. 1991-2000).

| Benign disease (p.311) | | Malignant disease (p.62) | |
|------------------------|-----|--------------------------|----|
| Goiter | 208 | Papillary Ca. | 47 |
| MTG | 76 | Follicular Ca. | 4 |
| FAN | 17 | Medullary Ca. | 7 |
| Graves | 10 | Undifferentiated Ca. | 4 |

Table II. Differentiated microcarcinomas of thyroid (30 p).

| Clinical presentation | | |
|---|-------------------------|-----------------------|
| A | B | C |
| Clinically Suspicious Neoplastic Nodularity 11 | Incidental cancer 17 | Occult carcinoma 2 |

nosis of papillary TMC and in 2 cases a diagnosis of follicular TMC, with multifocality in one case were made. In 15 cases a total thyroidectomy was performed and in 2 cases a partial resection, subsequently completed with resection of residual thyroid tissue in one patient; however in no patient was a lymphadenectomy performed.

In group C consisting of 2 patients, total exeresis revealed a papillary "occult" carcinoma responsible for lymph node metastases (Table II); in one case lymph node metastasis occurred on opposite side of the primitive tumour. We performed a total thyroidectomy with central lymph node dissection and homolateral modified functional lymph node dissection.

Altogether 27 total thyroidectomies were performed and 3 conservative resections which were subsequently completed, with 5 central neck lymph node dissections and 5 + 1 lateral neck dissections (Table III).

Thyroidectomy was followed in all cases with drainage of the glandular area by aspiration tubes, that were removed after 48 hours. The patients were discharged on the third or fourth day with a calcium and vitamin D therapy.

We didn't observe respiratory complications such as laryngeal oedema, tracheal malacia, permanent vocal cord paresis or definitive hypoparathyroidism.

The mean overall follow-up lasted 60 months. One patient had a homolateral lymph node recurrence at the site of primitive tumour 2 years after operation (Table IV).

All patients are living and are kept on TSH suppressive therapy.

Discussion

In clinically suspicious lesions there is no unanimous agreement on total thyroidectomy as first line treatment. In some cases in which the tumor is localized inside the gland away from the capsule and there isn't evidence of cervical lymph node metastases, some Authors consider extracapsular lobohistmectomy or subtotal thyroidectomy to be sufficient¹⁰⁻¹³. Moreover, some others have stressed the risk, albeit moderate, of hypoparathyroidism and recurrent nerve lesions after total thyroidectomy.

Our observations indicate that total thyroidectomy has definite advantages, mainly the elimination of any chance of a neoplastic multicentric focus. It is however necessary to remember that not all Authors consider plurifocality and the possible appearance of local recurrence to have a real prognostic significance¹⁰.

A central lymph node dissection should always be performed when cancer is suspected, while a lateral modified functional dissection must be performed in cases of clinical evidence of lateral lymph node involvement. We don't agree with some Authors who routinely perform a bilateral lymphadenectomy in case of papillary TMC. Indeed it is always possible, considering the slow growth of such tumours, to perform a surgical subsequently treatment, after a careful and correct follow-up.

Table III. Differentiated microcarcinomas of thyroid (30 p).

| Surgical treatment | | | |
|-----------------------|----|---|-------------------------------------|
| Total thyroidectomies | 27 | → | Central lymph node dissection |
| | | → | Functional monolateral dissection |
| Emithyroidectomies | 3 | → | Exeresis of residual thyroid tissue |
| | | | 5 5 + 1 1 |

Table IV. Differentiated microcarcinomas of thyroid (30 p.).

| Histological type | | Complications | | Follow-up | |
|-------------------|----|-------------------------|---|-------------------|---|
| Papillary ca. | 28 | Nerve recurrent lesions | 0 | 60 months | |
| Follicular ca. | 2 | Hypoparathyroidism | 0 | Disease recurrent | 1 |

In “incidental” discovery of a microcarcinoma during a conservative resection performed for benign pathology some Authors suggest a simple clinical-radiological follow-up¹⁴. In these patients, a total thyroidectomy is essential in order to complete the first conservative treatment. This approach is justified by certain considerations, such as the high incidence of multifocality and bilaterality of this kind of tumour. Our experience however only partially confirms literature data regarding plurifocality and bilaterality, since this percentage in our study has been small.

We believe in validity of total thyroidectomy for benign disease. The proof is that a neoplastic lesion was present in 5,57% of the total thyroidectomies performed for benign pathology. This incidence of cancer in multinodular goiter, in accordance with the data of the literature, is not unexpected. But we must also consider that in 58% of such patients (equal to 3% of total thyroidectomies for benign pathology) recurrent cervical lymph nodes which went originally undetected are already present and can be revealed only by postoperative scintigraphy. These data are sufficient to influence the opinions of even the most supporters of conservative surgery¹⁵.

As for lateral cervical lymph node metastases of a microcarcinoma which have been undetected by ultrasound, surgical treatment consists necessarily in total thyroidectomy and cervical lymph node dissection; in these cases, central lymphadenectomy with modified functional homolateral lymph node dissection is the treatment most often adopted; in some cases a modified functional bilateral lymph node dissection is possible^{16,17}.

As the data reveal, TMCs are considered by many Authors as a special category of neoplastic lesions, whose particular nature and associated problems distinguish them from those connected with clinically larger carcinomas.

The assessment of a tumour's malignancy cannot be based solely on its dimensions, given that biological aggressivity, whether local or distant, may be a characteristic of tumours both large and small. Therefore a microcarcinoma must be considered a single entity along with thyroid cancer and as such must be treated.

Supporters of conservative thyroidectomies justify their surgical choice by the possibility of postoperative hypoparathyroidism or lesions of the recurrent laryngeal nerve. Such risks, although always present in thyroid surgery, may be overcome, in our experience, by a precise surgical technique involving the preparation of recurrent nerves along their entire cervical passage and the binding of the lower thyroid artery at its origin. We consider certainly it more risky to re-operate on a residual gland with scar tissue, rather than to perform a total exeresis during the first operation.

Total thyroidectomy consents to reveal in the post-operative stage any possibility of distant metatasis by means of “whole body” scintigraphy. However, this is possible only in absence of residual glandular tissue, permitting in the meantime of radioiodine treatment with I-131.

In conclusion, therefore, total thyroidectomy may not only be a useful, but also a necessary surgical treatment leading to correct diagnostic therapeutic follow-up in these patients.

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