Surgical Management of Multinodular Goiter With Compression Symptoms

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Hypothesis: Multinodular goiter (MG) with compression symptoms has a clinical profile different from that of goiter without these symptoms. The surgical treatment of MG with compression symptoms has a high rate of sternotomy and morbidity.

Design: Retrospective study conducted between 1970 and 1999.

Setting: Tertiary referral center.

Patients: One hundred fifty-seven patients with MG with compression symptoms were reviewed from 672 patients with MG undergoing surgery in our department. We used 515 patients with MG without compression symptoms as a control group.

Intervention: All 157 patients underwent programmed surgery for thyroidectomy.

Main Outcome Measures: General patient data, history and symptoms, exploration (both physical and with complementary techniques), data on the surgery and surgeon, and postsurgery morbidity and evolution. The χ² test, the t test, and a logistic regression test were applied.

Results: Multinodular goiter with compression symptoms is characterized by its appearance in persons older than 55 years, a preoperative evolution of more than 10 years, and an intrathoracic component in more than 75% (P < .001). All the patients underwent surgery, with 6 (4%) requiring a sternotomy. Twenty-four percent had complications (n = 37), 3% of which corresponded to 4 cases of permanent recurrent laryngeal nerve injury. Eleven patients (7%) had an associated thyroid carcinoma, 9 of them corresponding to microcarcinomas. However, 5 were multifocal, and there was 1 anaplastic carcinoma, from which the patient died. All the papillary carcinomas are currently asymptomatic. The symptoms were remitted after surgery in all the cases except 1 dysphonia. Of the 32 patients receiving partial surgery, 9 (28%) had recurrence, of whom 6 underwent reoperation to complete the thyroidectomy.

Conclusions: Multinodular goiter with compression symptoms occurs in long-evolving goiters with an intrathoracic component. Surgery is the definitive treatment, as it excludes malignancy, involves low rates of permanent morbidity and mortality, and, if the technique is total thyroidectomy, avoids recurrences.

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The subgroup of patients with MG and compression symptoms accounts for 23% of the series (n=157). The mean age was 56±14 years, and the majority (90%) were female. Twelve patients (7.6%) had a family history of thyroid pathologic features, 32 (20%) came from areas of endemic goiter, and the mean time of goiter evolution was more than 10 years (128 months). Seventy-five percent of the cases had 1 compression symptom, whereas the rest had 2 or more. The most common was tracheal compression (n=87; 59%), where the presence of dyspnea was observed; 7 of these patients had intercostal pulling, abdominal respiration, and tachypnea, due to acute respiratory insufficiency. In 23 cases, the dyspnea was positional, triggered in the decubitus position and with the Pemberton maneuver. The second most common symptom was esophageal compression (n=76; 48%), and the third most common was recurrent compression (n=33; 21%) (Figure). Superior vena cava syndrome was noted in 7 cases (4.5%), with edema of the face, neck, and both upper limbs, dilatation of the veins in the neck and arms, and cyanosis in these same areas in 4 of the patients. The Pemberton maneuver was positive in all 7. One patient had Claude Bernard-Horner syndrome. Furthermore, 22 cases (14%) had associated hyperthyroidism.

The goiter had mostly an elastic consistency (78%), and 76% of the cases revealed an intrathoracic component. Simple cervicothoracic radiography showed tracheal compression displacement in 78% of the patients (n=122), and 41 of them received a thoracic computed tomographic scan to delimit its relationship with neighboring structures. Ultrasonography was performed in 108 (69%) of the patients and showed MG in all of them. Scintigraphy was performed in 99 cases (63%), including all those with hyperthyroidism, and showed the multinodular component of the goiter and, in the 22 cases of hyperthyroidism, the presence of 1 or more hot nodules. Ten patients with respiratory compression symptoms underwent respiratory function tests, and a laryngoscopy was performed in all the patients with dysphonia.

The variables analyzed were age, sex, family history of thyroid pathologic features, residence in endemic goiter areas, time of MG evolution prior to surgery, hyperthyroidism, goiter consistency on physical exploration, intrathoracic component according to Eschapase’s definition (goiter located totally or partially in the mediastinum, the lower edge of which in the operating position is at least 3 cm below the sternal manubrium), alteration in simple cervicothoracic radiography, difficulty in anesthetic intubation, surgical technique performed, surgeon’s experience (surgeon who has previously performed more than 100 thyroid operations), duration of surgery, goiter weight (weight of specimen referred for histologic examination), need for sternotomy, associated carcinoma, surgery-related morbidity, remission of symptoms, and recurrence of goiter or symptoms in the partial surgery techniques.

The following postoperative complications were noted: (1) hypoparathyroidism: it was considered during the postoperative period for calcium levels below 7.5 mg/dL (1.85 mmol/L) or when the patient had symptoms of hypocalcemia with levels below 8.5 mg/dL (2.1 mmol/L); if the calcemia remained below 8.5 mg/dL (2.1 mmol/L) at 1 year after surgery, it was labeled as permanent; (2) recurrent laryngeal nerve injury: it was considered for alteration in the tone and timbre, with normal laryngoscopy; (3) surgical wound complications; and (4) systemic complications. Postoperative mortality was also evaluated.

A descriptive statistical study was done, with application of the χ² test complemented with analysis of residues and the t test; a logistic regression test was used for the multivariate analysis using the variables that in the bivariate analysis showed a statistically significant association. Differences were considered significant for P<.05.

The 157 patients with MG and compression symptoms had a series of features distinguishing them from the rest of the patients undergoing goiter surgery: they were older (mean age, 56 vs 46 years; P<.001), they had a longer goiter evolution time (mean, 128 vs 78 months; P<.001) and higher frequency of goiter intrathoracic component (76% vs 25%; P<.001), and they often showed alterations in their chest radiography with regard to tracheal compression displacement and intrathoracic component (78% vs 30%; P<.001). In other words, they were patients older than 55 years with a preoperative evolution of more than 10 years, 75% with an intrathoracic component (Table 1). In the multivariate analysis, the variables differentiating MG with compression symptoms from the rest are older age (P=.002) and presence of a goiter with an intrathoracic component (P<.001; relative risk, 2.35) (Table 2).

All the patients underwent surgery, the indication for surgery being the presence of a compression symptom, except in 6 cases with suspected malignancy. Seventeen cases (11%) had intubation difficulty, and 4 patients required the use of a fibrobronchoscope for intubation. Eighty-seven percent (n=136) were operated on by surgeons with experience in endocrine surgery. In the remaining 21 cases (13%), surgery was carried out by surgeons without experience of endocrine surgery, although 20 of these were assisted by surgeons with experience. A total thyroidectomy was performed in 120 (76%), a bilateral subtotal thyroidectomy in 13 (8%), a hemithyroidectomy in another 13, completion of the thyroidectomy in the 5 patients undergoing reoperation in 3%, a Dunhill in another 5, and a unilateral resection (unilateral subtotal hemithyroidectomy) in the remaining case. Six patients (4%) required a sternotomy for removal of the goiter. Parathyroid autotransplantation was performed on 2 patients in whom it was determined that 1 of the parathyroid glands had been extirpated. The mean±SD operating time was 115±39 minutes.

Twenty-four percent (n=37) had complications during the postoperative period, these being definitive in 3% (n=4), corresponding to 4 cases of permanent recurrent

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Figure. Distribution of the different compression symptoms in our series.
Nine (28%) of the 32 patients receiving partial surgery had recurrence. Six of these goiters underwent re-operation to complete the thyroidectomy (Table 5).

Among the compression symptoms due to thyroid pathologic features, the most common is that of the airway, which is potentially serious as it can trigger acute respiratory insufficiency and even lead to death.13,14 It was also the most common compression symptom in our series (55%); 7 cases developed a serious acute respiratory insufficiency, all with a previous compression symptom, which account for 4.4% of the compression symptom cases which is potentially serious as it can trigger acute respiratory insufficiency and even death.13,14 It was also among the compression symptoms due to thyroid pathologic features, the most common is that of the airway, which is potentially serious as it can trigger acute respiratory insufficiency and even lead to death.13,14

COMMENT

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Esophageal compression symptoms were the second most common, with an incidence of over 45%. It is more often reported when the extension of the goiter is posterior.13,14 However, we have a high incidence of goiters with an anterior mediastinal component, something also observed in 1988 by Michel and Bradpiece,15 who reported it in up to 75% of their series. This is because our goiters had a large anterior mediastinal component, which
The incidence of recurrent compression symptoms was high (21%), surpassing the incidence in most series in the bibliography. In most cases, it was associated with another compression symptom due to the large goiter size. Also worth noting is the presence of 8 uncommon compression symptoms, such as superior vena cava syndrome in 7 cases (4.5%) and Claude Bernard-Horner syndrome in 1, which occurred in the context of a large intrathoracic goiter, with other associated compression symptoms and a progressive establishment.

All the compression symptoms in our series might have been caused, if subclinical, or might have been aggravated, if present, by changes in posture and maneuvers such as the Pemberton maneuver. In 23 cases, the dyspnea was totally positional; in the standing position, the patients were asymptomatic. Characteristic of goiters with

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*Size of largest tumor focus.
†Reoperated at 2 months to complete thyroidectomy (initial technique: hemithyroidectomy).
compression symptoms is the fact that there is often more than 1 symptom, something occurring in one quarter of our cases. This is because they are large intrathoracic goiters compressing more than 1 structure.

These goiters with compression symptoms are characterized by appearing in patients older than 55 years with a goiter of more than 10 years’ evolution and with an intrathoracic component (Tables 1 and 2). It must be remembered that the intrathoracic component is the fundamental factor for the development of compression symptoms, more than 75% of our patients had intrathoracic prolongation, the rest with large cervical goiters that had a mean weight of over 120 g and were found at the entrance to the thorax.

The rate of associated malignancy was 7% when usually it is 2% to 3%, although rates of up to 30% have been reported. It must be noted that although they are mostly well-differentiated microcarcinomas, a high percentage are multifocal, and aggressive variants such as anaplastic carcinoma have appeared. Evolution was satisfactory in all cases except the patient with an anaplastic carcinoma, who died. One patient with a multifocal carcinoma underwent reoperation 2 months after surgery to complete the thyroidectomy, as initially a hemithyroidectomy was done.

The rate of postoperative complications was high (24%), although the majority were transitory. Permanent lesions account for 3% and are due to lesions of the recurrent laryngeal nerve. This is due mainly to the fact that they are large, generally intrathoracic goiters, which are difficult to manage in the operating field, where with luxation of the thyroid the recurrent nerve may often be elongated and lesioned.

The results with regard to postsurgical remission of symptoms are excellent, with remission of all clinical features except 1 case of dysphonia. We do not know if this recurrent nerve had an irreversible lesion due to elongation prior to surgery or whether it was an intraoperative recurrent lesion. The remission of symptoms occurred immediately, except in the case of the dysphonia, which progressed in less than a month. These data confirm those obtained in 1994 by McHenry and Piotrowski, who achieved a 100% disappearance of compression symptoms in a series of large goiters, with no mortality and an incidence of complications that can be compared with that of thyroidectomy patients with a smaller thyroid size. The problem arose of operability, which is currently exceptional.

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REFERENCES