# Total thyroidectomy for benign thyroid diseases

## *Tireoidectomia total nas doenças benignas da tireóide*

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## ABSTRACT

**Objective**: To review the indications for total thyroidectomy as the preferred option in certain benign diseases of the thyroid in order to prevent recurrence or future reoperations. **Methods**: This retrospective study analyzed 66 patients, all from a private clinic, who underwent total thyroidectomy (TT), from January 1997 to December 2009. There were 58 (87.8%) females and eight (12.2%) men with the predominance of the white race (89.3%). **Results**: The mean age was 51.8 years (21/77), with the highest incidence in the fifth and sixth decades of life, with 34 (51.5%) patients. The most common preoperative diagnosis was nontoxic multinodular goiter, of which seven were also intrathoracic, followed by autoimmune thyroiditis; recurrent goiter occurred in 11 cases. Multinodular goiter was found in 37 (56.1%) patients, autoimmune thyroiditis in 22 (33.3%), follicular adenoma isolated in five (7.6%), Hurthle cell adenoma in two (3.0%). Sixteen patients (24.2%) had more than one histopathological diagnosis. Permanent injury of the recurrent nerve was observed in one patient (1.5%). There was no case of permanent hypoparathyroidism. There was no operative mortality. **Conclusion**: Total thyroidectomy is an operation that can be safely performed, with low incidence of permanent complications, which allows one to broaden its indications in various benign thyroid diseases, thus avoiding future recurrences and reoperations.

**Key words**: Thyroid gland. Thyroid diseases. Goiter, nodular. Surgery. Thyroidectomy.

## INTRODUCTION

The thyroid is a gland of internal secretion and unique site of several common diseases susceptible to medical or surgical treatments, or a combination of both. The association of high prevalence of thyroid diseases with publications from diverse regions and different schools of surgery often results in heterogeneous information that helps feed the controversy. The choice of surgery to treat some of thyroid affections is one among many. In this context lies the indication of total thyroidectomy (TT) for certain benign diseases, a trend that is gaining adherents in the last two decades[1-5]. The purposes are to avoid surprises due to a mistaken diagnosis of benignity in intra-operative frozen section examination, eliminating the possibility of a future or even incidental carcinoma, prevent recurrence and reoperation, admittedly more difficult and more prone to complications[6-9], though minimize by some, relying on experience and good surgical technique[10,11].

The indication of TT should be considered in cases of suspected malignant nodules, multinodular nontoxic goiter with bilateral involvement of thyroid follicular tumors, autoimmune thyroiditis and reoperations. It should also be considered in cases of nodules with a history of prior irradiation to the head and neck and diffuse toxic goiter[3,12,13], where resection can be an excellent treatment, especially in large goiters, in patients with severe ophthalmopathy, in children, in pregnant women and in those with a mental disability that impairs long-term follow-up[14].

This paper aims to discuss the indications for total thyroidectomy as the preferred option in certain benign diseases of the thyroid in order to prevent recurrence and future operations.

## METHODS

We carried out a retrospective study of patients with benign thyroid diseases operated from January 1997 to December 2009, analyzing the data relating to age, surgical treatment and postoperative evolution. Patients were from the private clinic and were operated by the same surgeon, even if treated by different endocrinologists, but who participated in the surgical indication. They were assisted by the same anesthesiologist and by the same pathologists.

Preoperative laryngoscopy was performed in patients with recurrent goiter and complaints related to phonation.

All patients received antibiotic therapy for 24 h. The drainage aspiration of the thyroid space was always used for 24 pm.

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## RESULTS

We operated 58 (87.8%) women and eight (12.2%) men, predominantly Caucasian (89.3%). The average age was 51.8 years (21/77), with the highest incidence in the fifth and sixth decades of life (34 – 51.5%).

Preoperative laryngoscopy was performed in 18 (27.2%) patients, 11 of them had recurrent goiter and seven had complaints related to phonation.

The most frequent diagnosis was multinodular goiter in 37 (56.1%) cases, followed by autoimmune thyroiditis in 22 (33.3%), follicular adenoma in 10 (15.1%), Hurthle cell adenoma in two (3.0%), 12 (18.2%) patients had autoimmune thyroiditis associated with goiter and four patients (6.1%) had autoimmune thyroiditis associated with follicular adenoma. Two (3.0%) patients developed severe hoarseness and in one (1.5%) a unilateral vocal fold paralysis was confirmed; in the remaining dysphonia disappeared within a maximum period of 30 days. There were no patients with permanent hypoparathyroidism, but in one (1.5%) calcium and vitamin D repletion was extended to 90 days. Oral feeding was started 12 hours after surgery. The average hospital stay was 36 hours; there was no case of bleeding and operative mortality was zero.

## DISCUSSION

The complication rates of TT are similar to partial thyroidectomy when operated in high surgical volume services[5,15]. In this context we have progressively extended the indications of TT in these patients.

It is known that non-toxic multinodular goiter is the most frequent indication for total thyroidectomy in benign diseases of the gland. In our series it was no different, TT being indicated in 37 (56.1%) patients; if we include another 12 that in addition to goiter had another associated diagnosis, they will add 49 (74.2%) of all operated. Noteworthy are our 11 cases of reoperations for goiter recurrence, eight having undergone previous unilateral lobectomy.

Unlike the endemic goiter where the role of iodine in prevention is recognized, the sporadic type has a more complex pathogenesis and possibly multifactorial, because besides the regulation caused by TSH, it seems that other mechanisms such as the epidermal growth factor and stimulation of immunoglobulins are involved[16]. The use of thyroid hormone in the postoperative period, applyed by some in an attempt to avoid a relapse, is no proven method and its main indication remains the correction of hypothyroidism[17]. Piraneo[18] clearly associated with the recurrence with the size of the remnant gland, reporting 20% of recurrence after lobectomy alone, while only 4% in bilateral subtotal thyroidectomy. In cases of involvement of both lobes, regardless of the size of the nodules, as well as in large goiters with compression symptoms and the recognition that the most frequent indication for reoperation is recurrent goiter[6,7], TT is gaining more and more defenders.

The follicular tumor is certainly the most uncomfortable preoperative diagnosis for the surgeon. Not even the most experienced pathologist is able to define, by cytologic or perioperative frozen section exams, the real nature of these tumors, since the criteria for commitment of the capsule and angioinvasion, which characterize the carcinoma, are pathological.

The postoperative diagnosis of follicular carcinoma almost always results in a new operation to total thyroidectomy, regardless of prognostic factors. Thus, without definitive diagnosis, and knowing that about a third of follicular neoplasms may be malignant, TT is a valid, yet riskier, option for those with bilateral nodules and those who do not accept the possibility of a reoperation.

The autoimmune thyroiditis, also known as Hashimoto's thyroiditis, is an always-evolving clinical disease and the main cause of primary hypothyroidism. Besides the blood tests that bring the suspicion of the disease, ultrasound usually shows an enlarged gland, with heterogeneous texture and pseudonodules, in several cases displaying well-defined nodules, which characterize the nodular thyroiditis. Usually, treatment is clinical, but it deserves special attention for possible association with thyroid carcinoma. It is another controversial issue and studies show incidence ranging from zero to more than 30%[19-22]. Some researchers have observed a higher incidence of cancer in this type of thyroiditis, suggesting that this association is not just casual. Di Pasquale[23], on an extensive review of 23 cases of thyroiditis spanning 16 years, found 30 papillary carcinomas and three follicular associated.

In the period that includes the present study, we performed thyroidectomies in 37 patients with autoimmune thyroiditis, of which 12 (32.4%) had concomitant carcinoma, all papillary. Once defined the surgical approach, we consider TT as the best option, as in 22 (33.3%) of our cases.

The risk of complications after thyroidectomy is potentially large, but they have low incidence. As general complications such as wound infection, seroma and bleeding that occur sporadically are easier to prevent and treat, the goal is to perform such an operation preserving the integrity of the laryngeal nerves and parathyroid glands, avoiding permanent complications.

Vocal fold paralysis can be temporary or permanent and has an incidence ranging from 0 to 5.0%[24] and greater potential risk in reoperations. Such an occurrence, although low, can be disastrous, although some cases of unilateral paralysis can evolve without interfering with voice or breathing due to contralateral compensation. We always have a preoperative laryngoscopy performed before a reoperation, but only in some cases after surgery.

Vocal cord paralysis almost always results from direct surgeon action over the recurrent laryngeal nerve and may occur after section, thermal injury by cautery or

by nerve entrapment by the suture; it may also be secondary to neuropraxia or the formation of perineural fibrous tissue arising from the exposure. Interesting to note is the curious evolution of the patient who had vocal cord paralysis, but usually spoke in the early days, the hoarseness becoming manifest only in the ninth day after surgery.

The care of preservation of the recurrent nerve should be observed by all surgeons, as a total thyroidectomy can hardly be held safely without identifying it to the fullest extent. In special situations where its dissection appears very difficult, a section of the isthmus of the thyroid and its release in the mediolateral direction can be helpful. Possibly, surgical trauma secondary to exposure of the nerves explain that seven (13.4%) of patients had mild dysphonia or transient hoarseness, although in two they could be considered serious. Except in situations that interfere with breathing, we only considered the indication for examination of the vocal cords after 30 days if the complaints remained.

The external branch of superior laryngeal nerve, whose injury may go unnoticed, except for those who use their voices as a tool, also deserves attention. It is difficult to identify and its inadvertent damage often occurs when during section of the superior thyroid artery. The best way to preserve them is to perform the individual ligation of its terminal branches near the thyroid on the occasion of the release of the upper poles.

Hypoparathyroidism is another complication of thyroidectomy, and in most cases it is transient and may be caused by injury, devascularization or removal of a gland, although other non-mechanical factors may be associated with the development of hypocalcemia[25]. Its incidence is less than 3%[26]. During a thyroidectomy, all parathyroid glands are rarely identified with certainty, especially in reoperations. Thus, capsular dissection and individual ligation of the terminal branches of the thyroid arteries are important maneuvers to preserve these small glands. It is also a good practice to immediately reimplant, in the sternocleidomastoid, any parathyroid that has been devascularized or inadvertently removed during dissection[27]. In none of our patients we dosed calcium in the first 20 days after surgery, as we consider the clinical evaluation enough. Therefore, 12 of them used oral calcium, most until the 10th day after surgery. Clinical signs of hypocalcemia were considered significant in only two of them, whose administration of calcium and vitamin D was extended to 30 and 90 days. None of our patients had permanent hypoparathyroidism.

In conclusion, total thyroidectomy is an operation that can be safely performed, with low incidence of permanent complications, which allows one to broaden its indications to various benign thyroid diseases, thus avoiding future recurrences and reoperations.

## R E S U M O

***Objetivo**: discutir as indicações da tireoidectomia total como opção preferencial em determinadas doenças benignas da tireóide, com a finalidade de evitar recidivas ou futuras reoperações. **Métodos:** estudo retrospectivo de pacientes portadores de doenças benignas da tireóide, realizado no período de janeiro de 1997 a dezembro de 2009, analisando os dados relativos à idade, tratamento cirúrgico, evolução pós operatória. **Resultados**: A idade média foi de 51,8 anos (21/77), sendo a maior incidência na quinta e sexta décadas de vida, com 34 (51,5%) pacientes. O diagnóstico mais comum no pré operatório foi de bócio multinodular atóxico, onde sete tinham características de mergulhantes, seguido da tireoidite autoimune; os bócios recidivados foram 11. O bócio multinodular foi encontrado em 37 (56,1%)pacientes, a tireoidite autoimune em 22 (33,3%), o adenoma folicular isolado em cinco (7,6%), o adenoma de células de Hürthle em dois (3,0%). Dezesseis pacientes (24,2%) tiveram mais de um diagnóstico histopatológico. A lesão permanente de nervo recorrente foi observada em um paciente (1,5%). Não foi registrado nenhum caso de hipoparatireoidismo definitivo. Não houve mortalidade operatória. **Conclusão**: a tireoidectomia total é uma operação que pode ser realizada com segurança e baixa incidência de complicações permanentes, o que permite ampliar suas indicações nas diversas doenças benignas da tireóide evitando, assim, futuras recidivas e reoperações.*

***Descritores**: Glândula tireoide. Doenças da glândula tireoide. Bócio nodular. Cirurgia. Tireoidectomia.*

## REFERENCES

1. Liu Q, Djuricin G, Prinz RA. Total thyroidectomy for benign thyroid disease. Surgery 1998; 123(1):2-7.
2. Gough IR, Wilkinson D. Total thyroidectomy for management of thyroid disease. World J Surg 2000; 24(8):962-5.
3. Stokes OJ 3rd. Total thyroidectomy (TT) for management of benign thyroid disease. World J Surg 2004; 28(2):218; author reply 218-9.
4. Tezelman S, Borucu I, Senyurek Giles Y, Tunca F, Terzioglu T. The change in surgical practice from subtotal to near-total or total thyroidectomy in the treatment of patients with benign multinodular goiter. World J Surg 2009; 33(3):400-5.
5. Efremidou EI, Papageorgiou MS, Liratzopoulos N, Manolas KJ. The efficacy and safety of total thyroidectomy in the management of benign thyroid disease: a review of 932 Cases. Can J Surg 2009; 52(1):39-44.
6. Wilson DB, Staren ED, Prinz RA. Thyroid reoperations: indications and risks. Am Surg 1998; 64(7):674-8; discussion 678-9.
7. Menegaux F, Turpin G, Dahman M, Leenhardt L, Chadarevian R, Aurengo A, et al. Secondary thyroidectomy in patients with prior thyroid surgery for benign disease: a study of 203 cases. Surgery 1999; 126(3):479-83.

8. Lefevre JH, Tresallet C, Leenhardt L, Jublanc C, Chigot JP, Menegaux F. Reoperative surgery for thyroid disease. Langenbecks Arch Surg 2007; 392(6):685-91.
9. Terris DJ, Khichi S, Anderson SK, Seybt MW. Reoperative thyroidectomy for benign thyroid disease. Head Neck 2010; 32(3):285-9.
10. Levin KE, Clark AH, Duh QY, Demeure M, Siperstein AE, Clarck OH. Reoperative thyroid surgery. Surgery 1992; 111(6):604-9.
11. Chao TC, Jeng LB, Lin JD, Chen MF. Reoperative thyroid surgery. World J Surg 1997; 21(6):644-7.
12. Friguglietti CU, Lin CS, Kulcsar MA. Total thyroidectomy for benignin thyroid disease. Laryngoscope 2003; 113(10):1820-6.
13. Hussain M, Hisham AN. Total thyroidectomy: the procedure of choice for toxic goitre. Asian J Surg 2008; 31(2):59-62.
14. Boger MS, Perrier ND. Advantages and disavantages of surgical theraphy and optimal extent of thyroidectomy for the treatmernt of hyperthyroidism. Surg Clin North Am 2004; 84(3):849-74.
15. Ho TW, Shaheen AA, Dixon E, Harvey A. Utilization of thyroidectomy for benign disease in the United States: a 15-year population-based study. Am J Surg 2011; 201(5):569-73.
16. Serpell JW, Phan D. Safety of total thyroidectomy. ANZ J Surg 2007; 77(1-2):15-9.
17. Teuscher J, Peter HJ, Gerber H, Berchtold R, Studer H. Pathogenesis of nodular goiter and its implications for surgical management. Surgery 1988; 103(1):87-93.
18. Berglund J, Bondesson L, Christensen SB, Larsson AS, Tibbin S. Indications for thyroxine therapy after surgery for nontoxic benign goitre. Acta Chir Scand 1990; 156(6-7):433-8.
19. Piraneo S, Vitri P, Galimberti A, Guzzetti S, Salvaggio A, Bastagli A. Recurrence of goitre after operation in euthyroid patients. Eur J Surg 1994; 160(6-7):351-6.
20. Anil C, Goskel S, Gursoy A. Hashimoto's thyroiditis is not associated with increase risk of thyroid cancer in patients with thyroid nodules: a single-center prospective study. Thyroid 2010; 20(6):601-6.
21. Cipolla C, Sandonato L, Graceffa G, Fricano S, Torcivia A, Vieni S, et al. Hashimoto's thyroiditis coexistent with papillary thyroid carcinoma. Am Surg 2005; 71(10):874-8.
22. Larson SD, Jackson LN, Riall TS, Uchida T, Thomas RP, Qiu S, et al. Increased incidence of well-differentiated thyroid cancer associated with Hashimoto's thyroiditis and de role of the PI3k/Akt pathway. J Am Coll Surg 2007; 204(5):764-75.
23. Repplinger D, Bargren A, Zhang YW, Adler JT, Haymart M, Chen H. Is Hashimoto's thyroiditis a risk factor for papillary thyroid cancer ? J Surg Res 2008; 150(1):49-52.
24. Di Pasquale M, Rothstein JL, Palazzo JP. Pathologic features of Hashimoto's-associated papillary thyroid carcinomas. Hum Pathol 2001; 32(1):24-30.
25. Järhult J, Lindestad PA, Nordenström J, Perbeck L. Routine examination of the vocal cords before and after thyroid and parathyroid surgery. Br J Surg 1991; 78(9):1116-7.
26. McHenry CR, Speroff T, Wentworth D, Murphy T. Risk factors for postthyroidectomy hypocalcemia. Surgery 1994; 116(4):641-7; discussion 647-8.
27. Olson JA Jr, DeBenedetti MK, Baumann DS, Wells SA Jr. Parathyroid autotransplantation during thyroidectomy. Results of long-term follow-up. Ann Surg 1996; 223(5):472-8; discussion 478-80.

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