CONTROVERSIES IN THE SURGERY OF BENIGN THYROID DISORDERS

A.N. Sinha, Dalbir Singh Sandhu

Department of Surgery, Rockland Hospital, Qutab Institutional Area, New Delhi 110016, India

Abstract: *Use of total thyroidectomy (TT) for differentiated thyroid carcinoma is controversial, but even more controversial is the use of TT for benign thyroid disease. The utility of TT for benign thyroid diseases aims at avoiding the risk of leaving behind abnormal thyroid tissue, a potential source of disease recurrence. Suppressive hormonal treatment with L-thyroxin after partial thyroid resection often does not prevent re-growth in the thyroid remnant. It is also well known that re-operation greatly increases the risk of injury to the parathyroid glands and recurrent laryngeal nerves. TT is considered extremely effective in patients with Grave's disease with progressive exophthalmos. However, for most surgeons, benign thyroid disease does not represent an indication for TT. Most surgeons prefer to perform subtotal thyroidectomy for such benign condition as multinodular goiter and hyperthyroidism even when they have to leave grossly abnormal tissue in the neck owing to the complication rate associated with this procedure. With the emergence of surgical endocrinology as superspeciality, total thyroidectomy has been particularly relevant in endemic regions where patients present with a long standing large nodular goiter with virtually no normal thyroid tissue. Total thyroidectomy has therefore, been considered a valuable option for treating benign thyroid disorders.*

INTRODUCTION

Disorders of thyroid gland affect 3% to 5% of population; these occur as the 2nd most common endocrine disease next to diabetes mellitus. Benign goiter is endemic in the northern belt of India, Germany accounts for 90,000 to 1, 00, 000 operations per year. Goiter surgery is one of the most common surgical procedures.

In recent years surgeons are performing an increasing proportion of total thyroidectomy in comparison to other types of thyroid operations. In Australia, the proportion of total thyroidectomy in relation to all thyroid operations ranges from 10.5% in a survey of general surgeons upto 55% elsewhere by surgical endocrinologists.[2]

With the advent of anesthesia, antisepsis and appropriate surgical instruments, and due to the pioneering work of Kocher, Billroth, Halsted, Lahey and De Quervain and others — thyroid surgery has become a safe treatment modality with an acceptable low risk profile, offering many patients good prospects of cure. Now a days, death from thyroid surgery is rare. The incidence of the most common long — term complications, recurrent laryngeal nerve palsy and hypoparathyroidism, is genuinely low. The reported complication rates in the literature vary ranging from 0% for primary surgery to 20% for reoperative surgery for permanent RLN injury and from 0.5% to 11.0% for permanent hypoparathyroidism.'

ANATOMICAL CONSIDERATIONS

The clarification of the anatomy and blood supply of the parathyroid gland by Haisted and Evans, the development of appropriate instruments by Kocher, Spencer Wells, Halsted, Dunhill and others and the technique of ultraligation of vs. of the thyroid by Halsted laid the foundations of successful thyroid surgery (Figure 1). Although these developments occurred about a century ago, some of the advances were not well applied by all surgeons operating on the thyroid during the middle 50 yrs of the century. The improvement in results attributed to best modern practice has accompanied the recognition of endocrine surgery as a superspeciality and the leadership of the members of the International Association of Endocrine Surgeon.[2]

CONTROVERSIES IN SURGICAL MANAGEMENT

Controversy exists about the type of thyroid surgery with extent of resection, the operative frequency of recurrent goiter and Grave's disease, the experience of the surgeon, the hospital operative volume on post operative complication rates. Controversy also exists regarding: (i) Can total and subtotal thyroidectomies be performed safely without loss of parathyroid function or injury to recurrent laryngeal nerves? (ii) What is the minimum surgery to be performed Thyrotoxicosis?



Fig.1: Twigs of inferior thyroid artery specific for thyroid gland should should be ligated and not those for parathyriods. This will maintainblood supply of parathyroid glands.

TOTAL V/S SUBTOTAL THYROIDECTOMY

Total Thyroidectomy has been accepted for primary management of ***thyroid cancer***. Because of the reportedly high incidence of complication associated with this procedure, it was never accepted as a viable treatment option for management of benign thyroid disorders. With the advent of a safe surgical technique and recognition of pitfalls of subtotal thyroidectomy, total thyroidectomy is being performed increasingly for benign thyroid disorders. The recent literature shows comparable complication rates with total and subtotal thyroidectomy. The indications for total thyroidectomy for benign thyroid disorders are being evolved. Total thyroidectomy is a preferred option, as reoperation for recurrent goiter is associated with increased morbidity. The operation is indicated in all patients with toxic/ non toxic multinodular goiter and Grave's disease with ophthalmopathy. It is particularly relevant in endemic regions where patients present with a long standing, large nodular goiter with virtually no normal thyroid tissue. reoperation for recurrent goiter in such a setting often deed to with distressing complications.[3]

Total thyroidectomy can be done safely with a low rate of complications. The incidence of permanent recurrent laryngeal nerve (RLN) injury was 0.7% in our experience and should be less than 1%. The rate of permanent hyperparathyroidism was 2.2%, although other studies have shown that an incidence of less than 1% is achievable.2 Studies have been reported

Correspondence: **Dr. A.N. Sinha,** *C-3,3173, Vasant Kunj, New Delhi-70, (M) 9818266270, e-mail: aloknathsinha@yahoo.com*

with considerable higher complication rates and the complication rate appears to be higher when surgery is done by surgeons other than those with special endocrine surgical interest, expertise and experience.2 Several other studies have established that there is no significant difference in complication rates for total and subtotal thyroidectomy.

In pateints with ***benign multinodular goiter***, there is increasing recognition that total thyroidectomy is appropriate when there is significant nodular disease involving both lobes. When one lobe is relatively normal the case for total thyroidectomy is not as strong although in the longer term approx 12% of such patients develop recurrence and half of them require surgery. Subtotal thyroidectomy in a full-fledged MNG is a less satisfactory procedure with a long-term recurrence rate as high as 45% that is not influenced by thyroxine therapy.[2] Moreover there are increased risks of reoperative surgery when both sides have been previously operated. In another study the recurrence is 42% after 30 yrs follow up in a group of MNG patients.[5]

Three different *modalities* are commonly needed for treatment of ***hyperthyroidism*** i.e. *antithyroid drugs, radioiodine and surgery*. The treatment policy varies within and between different countries but surgery is worldwide less common and considered as second line of treatment. The first line is often antithyroid drugs or 131, both treatments carrying low complication risks. Surgical treatment is often performed in patients with large goiter or severe hyperthyroidism, for example with infiltrative ophthalmopathy. The relapse rate is high with antithyroid drugs — 40% to 60%. Patients with high initial total serum triodothyronine (T3) levels may have an increased risk for developing or worsening of ophthalmopathy when treated with 131 as compared to those treated by surgery. Treatment with prednisolone at the time of I treatment can decrease the risk for deterioration of the ophthalmopathy.[4]

Grave's disease is a controversial pathology with regard to the extent of appropriate surgery. Subtotal thyroidectomy has been the traditional operation for a century and has been performed for Grave's disease by surgeons who otherwise advocate total thyroidectomy for cancer and benign MNG. It has been well demonstrated in the literature that there is no reliable method of assessing the amount of thyroid to be preserved in individual cases treated by subtotal thyroidectomy. The thyroid remnants may hypertrophy in the future, causing pressure effects or suspicion of neoplasia if the remnant recurrence is nodular. There is an unavoidable risk of recurrent thyrotoxicosis which may require radioactive iodine treatment the patient may have wished to avoid when opting for surgical treatment initially and of hypothyroidism. Hypothyroidism may develop insidiously and remain unrecognized and untreated. It increases in frequency with time after surgery and is as high as 70% after 15 years. If it is accepted that the risks to RLN and parathyroid function are equivalent for subtotal and total thyroidectomy why not cure the disease with total thyroidectomy? It achieves predictable hypothyroidism which is controlled by immediate thyroxine replacement and monitoring.2

The role of total thyroidectomy specifically for patients with ophthalmopathy is an area of great interest. There is some evidence that thyrotropin receptor antibody levels tend to normalize after total thyroidectomy (Table I). Grave's ophthamopathy is a manifestation of the autoimmune disease and is not related to the level of thyroid hormones, so surgical treatment may be of more benefit than radioactive iodine therapy. There are anecdotal reports and some preliminary data indicating that total thyroidectomy, and not subtotal Thyroidectomy may be preferred for Grave's disease, particularly when there is ophthalmopathy.[2] (Figure 2)

Table1: *Laboratory Data After Surgery*

Group	N.	Tg. Detected	Tg Ab. (+)	TpoAb. (+)	Tr Ab. (+)
Total Thyroidectomy	50	1	0	8	2
Subtotal Thyroidectomy	50	21	21	32	6

Tg - Thyroglobulin; Tg Ab - Thyroglobulin antibody; TpoAb- Thyroid Peroxidase antibody; Tr.Ab - Thyrotropin Receptor Antibody.

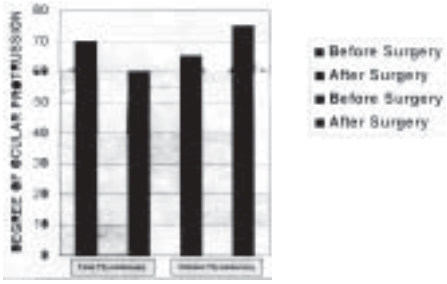


Fig. 2 changes of ocular protrusion after total and subtotal thyroidectomy in patients with thyroid associated ophthalmopathy

The technique of safe hemithyroidectomy or total thyroidectomy involves "apsuIar dissection". This was described in essence by Halsted and redefined more recently by Norman Thomson, Thomas Reeve. In the technique, the main inferior thyroid artery is not ligated, the parathyroid glands and their blood supply are preserved. The RLN is constantly sought during the dissection but is not always seen; in fact, it is ideally left undisturbed underneath a layer of fascia as it lies on the oesophagus or in the tracheooesophageal groove. It is not necessary to visualize and dissect the nerve in all cases but it would be advisable in situations where the nerve is at greater than usual risk of injury such as during reoperative surgery, large nodular goiters (especially, if they extend retrosternally) and cancers with local invasion or lymphnode metastases.2

Total thyroidectomy is a relatively safe operation with a low complication rate when performed by surgeons trained in "Capsular dissection" method. The lowest complication rate is appropriate for benign unilateral thyroid disease. There appears to be no significant difference in the rate of complications (haemorrhage, nerve injury, hypoparathroidism) for total and subtotal thyroidectomy.2

We have little enthusiasm fobtotal thyrodec because residual thyroid treatment may cause future recurrence, which is difficult to treat. It is preferred to thoroughly excise the pathology and eliminate the possibility of future recurrence and the need for reoperative surgery by performing total thyroidectomy for most patients (non toxic or toxic) involving both lobes or Grave's disease. Evidence suggests that the incidence of unsuspected malignancy with multinodular goiter is 63% and of these patients one — third presented with Grave' disease. Total thyroidectomy offers a complete initial treatment of these cases, taking care of multicentricity and future transformation into poorly differentiated carcinoma and avoiding the need for completion thyroidcectomy.3

Surgery thus has a definite role in the management of patients with hyperthyroidism, although other therapeutic modalities are available. As clinicians caring for patients, valid and reliable evidence may be obtained about the efficacy and safety of each of treatment options so that the information can be used during the decision-making process. Patients' value and preference must also be considered. Endocrine surgeons will continue to offer their expertise to both endocrinologists and patients to assist in optimizing care of thyrotoxic patients.

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