



## Capsular Dissection: A Preferred Technique in Total Thyroidectomy

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### Abstract

#### Aims and Objectives:

- (a) To stress on the importance of total thyroidectomy.
- (b) To emphasize on the advantage of capsular dissection technique.

**Settings and Design:** This is a prospective clinical study which was conducted in the Department of Otorhinolaryngology at AJIMS, Mangalore Karnataka from March 2009 – April 2010.

**Inclusion Criteria:** All benign thyroid diseases.

**Exclusion Criteria:** Solitary nodules, Diseases of the lobule, Previous head and neck surgeries.

**Keywords:** Capsular dissection; Total thyroidectomy; Recurrent laryngeal nerve; Hypoparathyroidism; Ligament of berry

### Introduction

Thyroid surgery is one of the most common surgeries performed in head and neck region. Total thyroidectomy involves the removal of the entire thyroid gland. Recurrent laryngeal nerve injury and hypoparathyroidism are two of the much-discussed major complications of thyroid surgery.

This case series study describes the technique of total thyroidectomy using capsular dissection. Total thyroidectomy is a safe procedure in which meticulous dissection can provide protection to the parathyroid glands and to the recurrent laryngeal nerve. This protection is achieved by using capsular dissection, dividing the tertiary branches of the vessels while dissecting the parathyroid glands with their vascular pedicles free from the thyroid surface, with minimal exposure of the recurrent laryngeal nerve and disturbance of its blood supply.

Total thyroidectomy removes all visible thyroid tissue although it is advised to leave a small remnant of tissue in the region of the ligament of Berry to protect the recurrent laryngeal nerve and the blood supply to the parathyroid glands. This technique ensures that the incidence of complications, including permanent hypoparathyroidism and recurrent laryngeal nerve palsy, is reduced to a minimum.

This method is indicated for non-malignant thyroid diseases like Diffuse involvement of the thyroid like in multinodular goiter, chronic thyroiditis and Grave's disease.

Capsular dissection method is not used in sub-total thyroidectomy as there is need for revision surgery as it has high chances of recurrence.

Main controversy surrounding surgical treatment of benign thyroid diseases relates to the appropriate extent of resection [1-5].

### Methods and Materials

Forty patients, who underwent thyroid surgeries, were included in the study, wherein 38 patients were females and 2 patients were male.

Patients who had preoperative RLNP were excluded from the study. In all the patients all relevant investigations were done and thoroughly evaluated. Hormonal profile was done. All patients underwent USG neck and FNAC. Preoperative indirect laryngoscopy was done and postoperatively

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movement of the vocal cords was inspected by direct laryngoscopy during extubation.

Under GA, collar incision was placed and midline dissection was done. Thyroid was dissected in the plane of capsule with careful ligation of blood vessels.

Middle thyroid vein as an important mark with minimum dissection posterior to the plane of the vein. Recurrent laryngeal nerves were identified on both sides and preserved. Wound closure was done after achieving hemostasis. Excised gland was sent for HPE. Sutures were removed after 1 week with regular follow up [6-10].

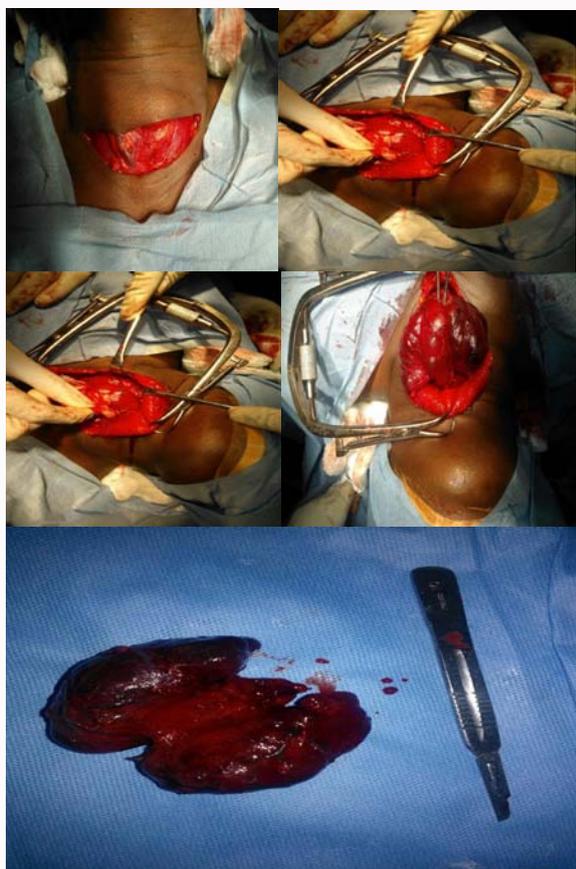
**Results**

The common complications of thyroidectomy are airway obstruction, bleeding, wound infection, hypocalcemia and recurrent laryngeal nerve injury.

Out of 40 patients who underwent total thyroidectomy by capsular dissection technique, the incidence of permanent nerve damage was zero and the incidence of hypocalcemia was found to be around 2.5% (Figure 1 and Table 1).

**Discussion**

Total thyroidectomy has been indicated by most surgeons in view of the multi-centricity of thyroid cancer, incidence of 5% to 15% local recurrence in the opposite thyroid lobe and higher incidence of complications in re-operative thyroid surgery. Besides total thyroidectomy also facilitates follow-up with thyroglobulin, which would not be possible in the presence of normal thyroid tissue.



**Figure 1:** Thyroidectomy are airway obstruction, bleeding, wound infection, hypocalcemia and recurrent laryngeal nerve injury.

**Table 1:** Incidence of hypocalcemia.

Symptoms	No of Patients	Percentage
Airway obstruction	0	0
Bleeding	0	0
Hypocalcemia	1	2.5%
Wound infection	0	0
Recurrent laryngeal nerve injury	0	0

Though capsular dissection technique is the preferred method, many surgeons still prefer not to perform total thyroidectomy for benign thyroid swellings due to fear of associated complications.

The most common cause for iatrogenic recurrent laryngeal nerve injury is total thyroidectomy. It leads to either temporary or permanent damage. The various mechanisms of nerve injury include complete or partial transection, traction, contusion, crush injury, thermal damage while using electrocautery, misplaced ligature or compromised blood supply. Delayed onset recurrent laryngeal palsy developing within few days after surgery is considered to be caused either by pressure effect of surrounding tissue oedema or hematoma. There is increased chance of recurrent laryngeal nerve palsy when there is increased local scar formation as seen in thyroiditis, previous radiation and prior neck surgeries.

In the previous studies, temporary recurrent laryngeal nerve palsy was in the range of 4% to 5.8% while permanent palsy was in the range of 0% to 5%.

Temporary or permanent hypocalcemia is a common complication following total thyroidectomy arising due to parathyroid insufficiency. The incidence of temporary hypocalcemia can be up to 50% while permanent hypocalcemia can be up to 4%.

The highly variable location of parathyroid glands along with variations in its blood supply creates significant difference in the incidence and degree of the parathyroid insufficiency. There is increased chance of hypocalcemia following auto-transplantation, extensive thyroid resection and ischemia of the parathyroid gland. The risk factors pre-disposing to post-thyroidectomy hypocalcemia includes large volume goiter, recurrent goiter, retrosternal extension, advanced cancer and hyperthyroidism [11-15].

**Conclusion**

Goal of surgery – To eliminate the disease with low complications & – To minimize the necessity for re-operative procedures.

Lehwald et al. compared the risk of recurrent nodules after partial resection (18.6%) than total (2.5%).

Bliss et al. compared the recurrent laryngeal nerve palsy by capsular technique (0.3%-1.7%) and transient hypocalcemia (0.7%-1.3%).

Barczynski et al. compared recurrence of MNG in subtotal thyroidectomy (11.58%) and total thyroidectomy (0.52%).

Taking into account of the very low incidence of nerve and parathyroid injury in this series, meticulous capsular dissection is superior to dissection of the entire nerve in avoiding transient nerve damage as well as to avoid temporary hypocalcemia.

(a) total thyroidectomy based on anatomical, etiological and pathological concepts is a useful treatment in benign diseases

involving the entire thyroid gland

- (b) this technique prevents recurrence.
- (c) decreased likelihood of further disease
- (d) prevents revision surgeries
- (e) decreased associated risks of high chances of morbidity
- (f) low rate of complications

Total thyroidectomy by capsular dissection technique has very low incidence of recurrent laryngeal nerve and parathyroid injury, as per our data. Hence, we recommend this technique over the dissection of the recurrent laryngeal nerve along its entire course. Besides total thyroidectomy offers immediate and permanent cure with no recurrences.

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