

## Original Research Article

# A seven year experience in patients undergoing total thyroidectomy for benign diseases in a single unit of tertiary care centre: a retrospective case study

Dheer S. Kalwaniya, Jaspreet S. Bajwa\*, Gowtham K. Gowda, Akshay Narayan, Rohit Choudhary

Department of General Surgery, Safdarjung Hospital, New Delhi, India

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**\*Correspondence:**

Dr. Jaspreet S. Bajwa,

E-mail: [jpsbajwa25@gmail.com](mailto:jpsbajwa25@gmail.com)

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### ABSTRACT

**Background:** Thyroidectomy is a common surgical procedure performed worldwide by surgeons with varied training. It is the experience and the skills by which a surgeon performs, the indication of surgery and the extent of surgery which determines the outcome and the complication rates.

**Method:** This study is a retrospective study performed from January 2012 to December 2018 when a total of 170 patients underwent total thyroidectomy via Kocher's incision for benign diseases with clinically in hypothyroid state at Safdarjung Hospital, New Delhi in a single unit of a tertiary care hospital.

**Results:** The male: female ratio was 1:7.09 with average age of patients being 40 years. The overall complication rate was 18.82% (32 patients). Postoperative transient hypocalcaemia being the most common complication. There was no case of permanent hypocalcaemia. There was no injury to any nerve (recurrent or superior laryngeal). Transient recurrent laryngeal paresis was noted in 4 (2.35%) which resolved with conservative management. Complications like wound infection, sympathetic chain injury were not noted. The characteristic feature of this study was five cases of giant secondary retrosternal goitre which had average weight of greater than 500 grams which were operated using Kocher's incision. The average weight of other 165 patients was 70 grams  $\pm$  12 grams. There were no major post-operative complications except for post-operative recurrent laryngeal nerve paresis and seroma formation which was evacuated after 3 weeks of surgery.

**Conclusion:** Hence, from this it is concluded that it is the surgical experience and skills of the surgeon which make total thyroidectomy a safe procedure providing permanent cure with a low post-operative morbidity risk even with large sized retrosternal thyroid glands which can be operated via neck incision.

**Keywords:** Goitre, Hypocalcaemia and retrosternal goitre, Recurrent laryngeal nerve injury, Total thyroidectomy

### INTRODUCTION

The incidence of thyroid disease in general population is enormous. Thyroid disorders are the most frequently encountered endocrine disorders in India.<sup>1</sup> Thyroid is a small gland which produces hormones like thyroxine and

calcitonin which regulate the metabolism and calcium concentration in tandem with other hormones.<sup>1</sup> Abnormalities of thyroid gland can be divided into benign and malignant. In benign diseases, most commonly encountered are goitre, adenomas, grave's disease, hashimoto thyroiditis, etc.<sup>1</sup> Malignant diseases

constitute papillary, follicular, medullary and anaplastic thyroid carcinomas. Lymphomas present in old age. Extent of removal of thyroid gland is determined by the type of disease which is being encountered and is being followed since many centuries. But the main advancement in this procedure came in the Billroth and Kocher's era. Between 1877 to 1881, Billroth performed operations on 48 patients out of which four patients (8.3%) expired. Kocher performed the first thyroidectomy in 1872 and later performed 2000 operations out of which 4.5% mortality was observed.<sup>2</sup> He initially used vertical incision but later changed to transverse collar incision which is known now by his name (Kocher's incision). He was the first to notice post thyroid removal myxoedema which he called 'cachexia strumipriva'.<sup>2</sup> He was awarded Nobel prize for the monumental work in field of thyroid surgery in 1909. Pre Billroth- Kocher era witnessed grave complications with increased mortality and morbidity. With advancement, works of Kocher, Lahey, Crile and Riddell reduced operative mortality and morbidity from thyroidectomy.<sup>2</sup>

Total thyroidectomy has been main stay of treatment of nearly all primary malignant and certain benign diseases. If thyroid is to be removed, the superior and inferior thyroid arteries must be ligated carefully after skeletonization to avoid injury to superior and recurrent laryngeal nerves respectively.<sup>1,3</sup> Total thyroidectomy provides advantage of eliminating the risk of recurrence. The complications like recurrent laryngeal nerve palsy, superior laryngeal nerve palsy, etc have markedly reduced with time due to gaining experience in the surgery.<sup>1-3</sup>

**METHODS**

This is a retrospective descriptive study performed in Safdarjung hospital, New Delhi on patients who underwent Total Thyroidectomy for benign diseases over a period of seven years i.e. January 2012 to December 2018. There was a total of 170 patients which were operated. The data of these patients were collected from clinical records of in-patient department and outpatient department till the period of one month as in post-operative follow up.

**The findings**

preoperative Fine Needle Aspiration cytology (FNAC) report, weight and dimensions of thyroid gland, histopathological findings of excised tissue. Complications were recorded in the form of Recurrent Laryngeal nerve injury, post-operative hypocalcaemia, seroma, haemorrhage, etc. There was a total of five retrosternal goitres (secondary) which were prepared and operated via Kocher's incision. The record was collected and evaluated and the post-operative mortality, morbidity was assessed. The data was evaluated using SPSS version 17.0 and results are calculated.

**Inclusion criteria**

All patients who were preoperatively proven benign using Fine needle aspiration cytology.

**Exclusion criteria**

Malignant diseases and previously operated

**Objectives**

- Evaluate complications of total thyroidectomy
- Retrosternal goitre and its approach.

**RESULTS**

There were 170 total patients with 21 males and 149 females making the M:F ratio of 1:7.09.

**Table 1: Male to female ratio.**

Male	Female
21	149

The mean age of patients was 40 years with oldest being 80 years and youngest being 23 years.

**Table 2: Indications of surgery.**

Indication of surgery	Frequency
Diffuse colloid goitre	102
Multinodular goitre	63
Giant retrosternal goitre with obstructive symptoms	5

The average weight of 165 patients with total thyroidectomy was 70 grams +/- 12 grams ranging minimum from 50 grams to 200 grams. Here we have considered a giant retrosternal goitre which has a weight of more than 500 grams and on radiological findings it is extending into the superior mediastinum and on clinical examination has features of pemberton sign +ve.

All were operated via neck incision. All these cases were observed in females who had an age above sixty years and who neglected to get treatment.

The post-operative complications were noted in a total of 32 patients (18.82%) out of which transient hypocalcaemia (serum calcium levels <8 gm/ dl) was most common (25 patients) which presented as tingling sensation in fingers and face muscles.

This resolved by intravenous calcium injection for 2-5 days. Patients were discharged on oral calcium and the serum calcium levels were re checked after 1 week at time of outpatient department (OPD) visit.

Three out of five retrosternal goitres presented with transient hypocalcaemia (60% as compared to 15.15%). There was no case of permanent hypocalcaemia or

permanent hypothyroidism (which is defined as post procedure hypocalcaemia which requires treatment for more than one year).

**Table 3: Giant retrosternal goiters.**

Age /sex	Radiological findings	Dimensions	Weight	Incision given
65years/ Female	Right lobe extending into mediastinum upto sternal angle. Left lobe and isthmus enlarged	15cm×10 cm	550gm	Kocher's incision
60 years/ female	Diffuse swollen thyroid gland with multiple nodules with left lobe extending into mediastinum upto carina.	15.5cm×11.5 cm	580gm	Kocher's incision
73 years / female	Giant multinodular goitre with cystic lesions with retrosternal extension	17cm×11 cm	800gram	Kocher's incision
69 years/ female	Enlarged bilateral thyroid lobes with internal nodules largest up to 2cm. Extension of right lobe up to carina. (Figure 1)	16cm×8 cm	750grams	Kocher's incision
62 years/ female	Retrosternal goitre of approx 14× 9 cm size with extension upto sternal angle of louis	15cm×10 cm	700gm	Kocher's incision



**Figure 1: giant multinodular goitre which has a right lobe extension into retro sternum upto the carina (bifurcation of trachea).**



**Figure 2: post thyroidectomy on table view showing bilateral cut strap muscles to get a wide area to approach and remove thyroid gland. Trachea, right**

**inferior parathyroid (forceps tip), right carotid bundle and right recurrent laryngeal nerve visible.**

Other complications noted were seroma (6 patients) and transient recurrent laryngeal nerve paresis in 4 patients out of which three were having giant retrosternal goitre.

There was no permanent palsy of recurrent laryngeal or superior laryngeal nerve. There was no wound site infections, sympathetic chain or major vessel injury (Table 4). It is to mention here that there were multiple complications in single patient and the total aggregate was accounting to 32 (Figure 2).

**Table 4: complications and their frequency.**

Complication	Frequency	Frequency in retrosternal goitre
Transient hypocalcemia	25	4
Permanent hypocalcemia	0	0
Transient recurrent laryngeal nerve (RLN) palsy	4	3
Permanent RLN palsy	0	0
Seroma	6	4
Sympathetic chain/ major vascular injury	0	0

There were no post-operative mortalities.

**DISCUSSION**

Thyroid surgeries with passage of time have got refined since post Billroth- Kocher era (1880 onwards). But still

the risks and complications associated with total thyroidectomy deter the surgeons from performing the same for benign thyroid diseases.

Total thyroidectomy is currently indicated in carcinoma thyroid (all cases), toxic and nontoxic multinodular goitre and Grave's disease. Like many studies,<sup>3-5</sup> authors are of the view that total thyroidectomy is ideal for benign disorders to prevent recurrence.

In multinodular goitre, if both lobes are involved, it is advantageous to perform total thyroidectomy as it produces immediate relief of symptoms, provision of a definite histopathological diagnosis.<sup>6,7</sup> Authors followed this principle and performed surgeries.

A total of 32 (18.82%) patients had post-operative complications in the form of hypocalcemia, RLN paresis and seroma. This is similar to the result of Murthy et al<sup>2</sup> which showed complications in 36 out of 179 patients taking it upto 20.11%.

In our study, post-operative hypocalcaemia (hypothyroidism) was the most common complication seen in 25 (14.7%) patients.

Out of 5 giant retrosternal goitres, 4 presented with transient hypoparathyroidism (80%). All these cases were transient and were relieved by medication. There was no case of permanent hypoparathyroidism which was similar to the study performed but contrary to seen in studies performed by (2.23%), (2.2%) and (0.85%).<sup>2,8-10</sup>

Large goitres were associated with more cases of post-operative hypocalcaemia.<sup>11</sup> This was due to the capsular dissection technique which we followed where visualization and preservation parathyroid gland and its blood supply was done.

In our study, there was no permanent RLN palsy. There was only transient RLN paresis in 4(2.35%) patients out of which 3(out of 5) were giant retrosternal thyroids. This was similar to study performed in Germany.<sup>3,12</sup> Most studies showed RLN injuries from 4-13%. Observed permanent RLN palsy in 1% and 0% cases respectively.<sup>3,13</sup>

## CONCLUSION

The myth that the total thyroidectomy is a complicated procedure is wrong. Despite it exposes more parathyroid gland and RLN to surgical risk, it is inherently safe procedure, especially in experienced hands or when we follow surgical technique effectively. As mentioned by William Halstead, the extirpation of the thyroid gland for goitre typifies better than any operation the supreme triumph of surgeon's art, our study proves it and shows that rate of complications is very minimal. Hence, total thyroidectomy is a safe and optimal procedure for benign

thyroid disorders and gives immediate relief with no risk of recurrence.

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