POST THYROIDECTOMY COMPLICATIONS: THE HYDERABAD EXPERIENCE

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Objective: Thyroidectomy is a very common surgical procedure worldwide and is performed by surgeons with varied training. The outcome and complication rates are largely dependent on surgeon's skill and experience, the extent of surgery, indication of surgery and number of thyroid surgeries performed at that particular centre. The objective of this study was to determine the frequency of postoperative complications after thyroid surgery in Hyderabad, Pakistan. **Study Design**: It was a descriptive study and was carried out at 2 private hospitals including a teaching University Hospital over a period of 3 years from April 2005 to March 2008. **Patients and Methods**: All patients with goitre, who underwent any sort of thyroid surgery, were included in this study. Patients' bio-data including name, age sex, clinical status of thyroid, thyroid function tests, ultrasound, fine needle aspiration cytology and operative procedure, findings, post operative complications and histopathology reports were recorded. Data were analysed using SPSS 16.0. **Results**: The overall postoperative complication rate was 10.7%. Postoperative hypocalcaemia was the most frequent complication observed in 3.5% of all patients followed by recurrent laryngeal nerve (RLN) injury noted in 2.8% patients. The less common complications were bleeding, seroma formation and wound infection. Majority of these complications were associated with total thyroidectomy, male gender, and in patients with age more than 30 years. **Conclusion**: The commonest post thyroidectomy complication was hypocalcaemia. Male gender, old age, and extensive thyroid surgery were associated with increased complication rate.

Keywords: thyroidectomy, hypocalcaemia, recurrent laryngeal nerve injury

INTRODUCTION

Thyroidectomy is a very common surgical procedure worldwide and is performed by surgeons with varied training and backgrounds such as general surgery, thoracic surgery, endocrine surgery, otorhinolaryngology, oncological surgery, and head and neck surgery. Thyroid surgery has followed all the steps of evolution to reach the time of endoscopic surgery.[1] Thyroid surgery have been performed since ancient times. It is one of the most frequently performed surgical procedures worldwide, even if the risks of lethal postoperative complications prevented its evolution and diffusion until the beginning of the 20th century.[2] In early 20th century thyroidectomy became a safe and acceptable operation with the advent of general anaesthesia, antisepsis and haemostatic techniques. Genius attitude and surgical talent of Theodor Kocher of Berne, Switzerland raised thyroid surgery to scientific level, brought surgical skills on the top of surgical art pyramid, and brought him personally to Nobel Prize in 1909. His excellent work in this regard led to a reduction in mortality from 50% to less than 4.5%.[3,4] The outcome and complication rates are largely dependent on surgeon's skill and experience, the extent of surgery, indication of surgery and number of thyroid surgeries performed at that particular centre. The objective of this study was to determine the frequency of postoperative complications after thyroid surgery in Hyderabad.

PATIENTS AND METHODS

This descriptive study was carried out at Isra University Hospital, Hyderabad and another private hospital over a period of 3 years from April 2005 to March 2008.

All patients with goitre, who underwent any sort of thyroid surgery (e.g., lobectomy, isthmusectomy, subtotal thyroidectomy, near total thyroidectomy, or total thyroidectomy) were included in this study. Anaesthesia and cardiovascular complications were excluded from the study. All patients were electively admitted via out-patient department. Investigations like thyroid function tests, serum calcium, thyroid scan, ultrasonography and fine needle aspiration cytology (where indicated) were performed. Indirect laryngoscopy was done a day before surgery by ENT surgeon to see preoperative vocal cord abnormality. The study was approved by Ethics Review Committee.

Thyroid surgery was performed by collar incision two finger breadths above the sternal notch. Superior and inferior subplatysmal flaps were raised from sternal notch to thyroid cartilage. The strap muscles were not routinely divided except for large goitres. The middle thyroid veins were ligated and divided first whenever found. The superior thyroid pedicle was individually ligated and divided after retracting it downward and laterally after identifying the external branch of superior laryngeal nerve. The recurrent laryngeal nerve (RLN) was identified above the level of the inferior thyroid artery. Inferior thyroid artery was usually ligated in continuity. Procedure was

completed according to the extent of surgery. The neck was routinely drained with suction drains as long as required. Patients were usually discharged by 48–72 hours postoperatively. All patients had their vocal cords checked at the time of extubation. All patients had serum calcium analysis on the day of surgery and on two subsequent days.

Permanent RLN palsy was labelled when persisting for more than 6 months after surgery. Hypocalcaemia was divided in two categories. Temporary symptomatic hypocalcaemia was considered when serum calcium level was less than 7 mg/dl, requiring calcium and/or vitamin D supplements and this hypocalcaemia was resolved within 6 months. Permanent hypoparathyroidism was considered when hypocalcaemia persists for more than 6 months despite regular calcium and vitamin D supplements. The patients were followed up monthly for the first 3 months and then every 3 months for at least 6 months to 1 year.

The data was analysed using SPSS 16.0 to determine the impact of age group, gender and operation category over the complication rate.

RESULTS

Between April 2005 and March 2008, 140 patients underwent different thyroid operations ranging from unilateral lobectomy to total thyroidectomy. The commonest operation was subtotal thyroidectomy (57, 40.7%) followed by hemithyroidectomy (52, 37.1%). Table-1 shows the detailed account of different thyroid operations.

Table-1: Types of Thyroid Operations (n=140)

Operation	No of patients	%
Hemithyroidectomy	52	37.1
Sub-total thyroidectomy	57	40.7
Near total thyroidectomy	11	7.8
Total Thyroidectomy	19	13.5
Isthumusectomy	1	0.7

Of the 140 patients the female to male ratio was 9:1 with mean age of 32 years and range of 16–68±8.224 years. The overall postoperative complication rate was 10.7%. Hypocalcaemia was observed in 3.5% of patients and was considered as the most common postoperative complication. Temporary hypocalcaemia was seen in 4 (2.8%) patients while permanent hypocalcaemia occurred in 1 (0.7%) patient. Recurrent Laryngeal Nerve injury was observed in 2.8% of patients. It was temporary neuropraxia in 2 (1.4%) patients which recovered within 1 month after surgery. In other 2 patients there was permanent RLN injury and both of these patients had infiltrating papillary carcinoma of thyroid cancers in the posterior aspect of lobe. Other less common postoperative complications included postoperative bleeding (2, 1.4%), seroma formation (2, 1.4%), stitch sinus (1, 0.7%) and wound infection (1, 0.7%). Ages more than 30 years, male gender and near total thyroidectomy or more extensive surgery were associated with statistically significant increase in postoperative complication rate. The detailed account of impact of age group, gender and operation category over the postoperative complication rate is mentioned in Table-2.

Table-2: Impact of age, gender and operation category on postoperative complication rate

Parameter		Complication rate	*p*
Age group	≤30 years	3/73 (4.1%)	0.008
	>30 years	12/67 (70.9%)	
Gender	Male	4/14 (28.5%)	0.023
	Female	11/126 (8.7%)	
Operation category	Hemithyroidectomy	1/52 (1.9%)	<0.001
	Subtotal thyroidectomy	0/57 (0%)	
	Near total thyroidectomy	3/11 (27.2%)	
	Total thyroidectomy	11/19 (57.8%)	
	Isthmusectomy	0/1 (0%)	

There was no postoperative mortality in this study.

DISCUSSION

No surgical operation can be done without the risk of complication under any kind of anaesthesia. There has been a significant reduction in the incidence of complication and mortality in thyroid surgery since the beginning of the 20th century, currently making thyroidectomy a surgical procedure with low acceptable morbidity and mortality rates. This is probably due to safer general anaesthesia, better antisepsis and the development of fine haemostatic instruments.[5] Nonetheless; major complications of thyroid surgery (e.g., compressive haematoma, recurrent laryngeal nerve injury and hypoparathyroidism) are still fearful complications. The complications relating to damaged individual structures can be kept to a minimum by operating in a bloodless field and performing a meticulous anatomical dissection.[6]

The overall postoperative complication rate in this study was 10.7% and no mortality was reported. In comparison to this, a recent international study reported nearly 0% mortality rate and less than 3% complication rate.[2] Major complications of thyroidectomy are hypocalcaemia, RLN injury and postoperative bleeding. In recent days, thyroid crisis is rare as almost all toxic patients undergo surgery only when they are converted euthyroid adequately by anti-thyroid drugs/beta-blockers or by both. Other less frequent complications are surgical site infection, stitch sinus, granuloma, keloid, wound and chylous fistula.[4,7,8]

Postoperative hypocalcaemia can be a significant clinical problem, which may delay patients' discharge and require a considerable postoperative care in immediate postoperative period. In our study, hypocalcaemia was noted in 3.5% of patients, and 1 patient (0.7%) among them developed permanent

hypocalcaemia. This incidence is consistent with some international[7–9] and national studies.[10–13] The rates of this significant problem in some recent series were reported between 5.4% and 14.4%.[14,15] The incidence of postoperative hypocalcaemia is higher after total thyroidectomy as compared to subtotal or near total thyroidectomy. During near total thyroidectomy or total thyroidectomy, parathyroid glands preservation should be attempted. If it is not possible to preserve the parathyroid, then it is recommended to do the parathyroid auto transplantation in ipsilateral sternomastoid muscle.

The exact incidence of RLN injury is unknown. Different studies have reported varying prevalence ranging from 0–14%.[16–19] This difference in complication rates reflects variation in surgical expertise, nature of operation, number of surgeries performed at that particular centre. The RLN injury was observed in four (2.8%) patients in this study. Out of these, two (1.4%) patients had permanent RLN palsy. Both of these patients had infiltrating papillary thyroid carcinoma in the posterior aspect of the lobe. Permanent RLN palsy rate of 1.4% in the present study is comparable with the recent international literature reporting this rate to be between 0.3 to 1.7%.[14,15,20,21] The temporary RLN palsy rate of 1.4% in this study is also consistent with the findings observed in some national studies which have reported this rate to be up to 4.7%.[12,22,23] The temporary RLN palsy rate is reported to be 2.6% to 5% in international literature.[24–26] Identification of RLN at surgery is the fundamental step to avoiding damage. When this policy is employed, any nerve damage is likely to be a transient neuropraxia and recovery will be expected, usually after a period of few weeks or months. If the nerve has not been identified, then paralysis will be permanent in up to one third of patients whose nerves have been injured. The anatomical relationship of RLN and inferior thyroid artery is highly variable and the operating surgeon should have complete knowledge of the normal as well as abnormal variation of the anatomy of this structure. Ligation in continuity of inferior thyroid artery and careful usage of bipolar diathermy minimizes the risks of RLN injury. However this incidence increases in cases of malignant thyroid diseases as noted in a recent international study.[27] Rates of RLN injury are also much higher in re-operative surgery for recurrent goitres. Rates of RLN palsy range between 3%–18% in operations for recurrent goiters.[28]

Postoperative bleeding into the wound is a serious complication of thyroidectomy. When bleeding and haematoma occur deep to the strap muscles, the situation can rapidly develop into life threatening emergency because of associated airway obstruction. In this study, 2 (1.4%) patients had postoperative bleeding. Both of these patients were re-explored and oozing from raw area was found. The reported incidence of postoperative bleeding in the literature ranges from 0 to 5%.[9,11]

Seroma formation, though not a serious complication of thyroid surgery, increases the morbidity. In this study, two (1.4%) patients developed seroma formation. One of these patients had toxic goitre and other had a huge goitre. In both of these patients needle aspiration was done resulting in complete resolution.

Superficial surgical site infection was observed in 1 (0.7%) patient and this is fairly comparable with an international study reporting about 2% surgical site infection.[5]

CONCLUSION

The post thyroidectomy complications observed in this study were hypocalcaemia, RLN injury, postoperative bleeding, seroma, stitch sinus and wound infection. Older age group, male gender and extensive thyroid surgery were associated with statistically significant increase in complication rate.

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