

Assessment of morbidity and mortality of thyroid surgery

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ABSTRACT

Background: To find out the incidence and types of complications after thyroidectomy. To analyze the factors related to the complications of thyroid surgery.

Material and method: The study was carried out at Shahid Suhrawardy medical college and Hospital, Dhaka from July 2007 to June 2008. Fifty patients were selected for the study who were treated by thyroidectomy. The mean patient's age at the time of surgery was 41.9 ± 8.1 years ranged from 10 to 60 years. Data were collected in a prescribed data collection sheet. Then all data were compiled and analyzed.

Result: 12% of the patients had transient hypoparathyroidism, 4% had haemorrhage, 2% had permanent hypoparathyroidism, 4% had temporary recurrent laryngeal nerve (RLN) palsy and 2% had permanent recurrent laryngeal nerve palsy. Other rare complications were superior laryngeal nerve palsy, hematoma, and wound infection.

Conclusion: Improved surgical techniques and proper management of complications reduce the postoperative morbidity and mortality of thyroid surgery. In spite of all measures, keen observation in postoperative period is very important to find out the complications for early intervention.

Key word: Thyroidectomy, recurrent laryngeal nerve palsy, hypocalcemia.

Introduction

Thyroid surgeries are the most common endocrine surgeries performed now a day. This procedure has tremendous evolution to make it a safe surgery. In spite of improved techniques, every thyroid surgeon has come across complications associated with this surgery. This study aims to understand various complications after thyroid surgeries and the factors responsible for complications and discuss management techniques for those complications in brief.

Neoplastic, inflammatory and endocrine abnormalities of the thyroid gland are extremely common affecting approximately 11% of the general population¹. Surgery for thyroid gland abnormalities is quite common². Thyroidectomy is one of the commonest operations for the Otolaryngology and Head-Neck Surgeons. Following thyroidectomy complications may develop, these are immediate and

late complications, such as haemorrhage, dyspnoea, seroma, haematoma, recurrent laryngeal nerve paralysis, thyroid crisis, wound infection and hypoparathyroidism. The complication which is most feared is trauma to the recurrent laryngeal nerve estimated to occur in between 1 and 10% of operations³⁻⁴. The nerve may be out, stretched or burnt, usually as a result of failure to recognize or dissect it properly. In unilateral paralysis of the RLN results in immobile vocal cord in the paramedian position which causes weak, cracked and breathy voice. Bilateral paralysis leads to severe airway obstruction necessitating an urgent tracheostomy in the majority of patients.

The external laryngeal nerve is traumatized more often than one supposes. Its close relationship to the

superior vascular pedicle and an occasionally aberrant course predispose it to damage⁶. Diathermy of the small vein which passed from the superior thyroid vein to the lateral part of cricothyroid muscle is a further cause of damage to this nerve. Hypocalcaemia which is uncommon after subtotal thyroidectomy for multinodular goiter may be the result of rough handling of the posterior aspect of the thyroid lobes or interruption of the terminal branches of the main divisions of the inferior thyroid artery. Hypocalcaemia is very common in total thyroidectomy. Intravenous calcium gluconate (10%) administered slowly provides an immediate solution to the symptoms. Hypothyroidism developing gradually over a period of months or year after operations is a common though acceptable complication of subtotal thyroidectomy and total thyroidectomy and is readily treated with thyroxine⁷.

Material and method

This prospective study was carried out at Shahid Suhrawardy medical college and Hospital, Dhaka from July 2007 to June 2008. Fifty patients were selected for the study who were treated by thyroidectomy. The mean patient age at the time of surgery was 41.9 ± 8.1 years ranged from 10 to 60 years. Data were collected in a prescribed data collection sheet. The data of each patients included age, sex, symptoms, signs, provisional diagnosis, preoperative investigations such as T3, T4, TSH, FNAC, ultrasonogram of thyroid gland, operative notes, histopathological examination and follow up. CT scan was done where indicated. Then diagnosis was confirmed by post-surgical histopathology. Other investigations like total blood count, RBS, FBS, S. creatinine, Urine R/M/E, ECG, chest X-ray were done as routine pre-requisite for operation. Then all data were compiled and analyzed. Statistical analysis was done by using appropriate statistical test.

Observation and results

In this study, we observed haemorrhage in two patients (5%), right sided vocal cord paresis in two patients, temporary hypothyroidism in one patient and wound infection in one patient. One patient (2%) showed transient tetany on 2nd post operative day which was improved later on. The results are shown in tabulated form below:

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Table-I: Shows age pattern of the patient.

Age in years	No. of Patients	Percentage (%)
10-20	03	06
21-30	15	30
31-40	17	34
41-50	08	16
51-60	07	14

Table-II: Shows sex of the patient among the study group.

Sex	No. of Patients	Percentage (%)
Female	44	88
Male	06	12

Table-III: Distribution of age-sex correlation

Age in year	No. of Patients	Female	Male	Female: Male
10-20	03	02	01	2:1
21-30	15	15	0	15:0
31 - 40	17	15	02	7.5:1
41-50	08	07	01	07:1
51-60	07	05	02	2.5:1
Total	50	44	06	

Table-IV: Shows distribution of occupation.

Occupation	No. of Patient	Percentage (%)
House wife	38	56
Student	06	12
Farmer	02	04
Service holder	01	02
Retired person	01	02

Table-V: Types of thyroid disease for which surgery was carried out.

Types of Thyroid disease	No. of Patient	Percentage (%)
Solitary nodular goitre	27	54
Multi nodular goitre	10	20
Adenomatous goitre	02	04
Papillary carcinoma without metastasis	08	08
Papillary carcinoma without metastasis	01	02
Follicular carcinoma	02	04

Table-VI: Type of surgery among the study group

Diagnosis	Hemi thyroidec tomy	Subtotal thyroidect omy	Subtotal thyroidect omy	Total thyroidect omy with neck dissection	Neatotal thyroidect omy	Excision of isthmus	Completion thyroidect omy	Total
Soltary nodular goitre	26					01	-	27
Milti nodular goitre	-	09	-	-	01	-	-	10
Adenomat ous goitre	02	-	-	-	-	-	-	02
Papillary carcinoma	03	-	05	01	-	-	-	09
Follicular carcinoma	-	-	01	-	-	-	01	01
Total	31	09	06	01	01	01	01	50

Table-VII: Distribution of post operative complications of thyroid surgery

Post operative complications	No. of patients	Percentage (%)
1. Haemorrhage/Haematoma	2	4
2. Air way Obstruction	0	0
3. Recurrent laryngeal nerve paralysis	Temporary Persistent	1 1
4. Hypoparathyroidism (Temporary)	1	2
5. Wound infection	1	2
6. Thyrotoxic crisis	0	0
Total	6	12

Table-VIII: Mortality after thyroid surgery among the study group

Total number of patients	Number of patients expired	Percentage (%)
50	0	0

Discussion:

Thyroid surgery is one of the most common endocrine surgeries. The age of the patient at the time of surgery ranged from 10 to 60 years. We observed in our study the maximum incidence is in third and fourth decade. Kasemsewan L et al⁵, mentioned in their study that the peak incidence is in fourth and fifth decade.

In this series, out of 50 cases, 44 patients (88%) were female and 12 patients (24%) were male, with a

female to male ratio was 7.33: 1. There was a female preponderance in this series but it was higher than that of the study of Kasemsewan L et al⁵. The incidence of thyroid diseases were quite higher in female patient in all age group. Regarding occupation of patients, majority of patients 38 (76%) were house wife. Out of 50 patients-6 patients (12%) were student, 2 patients (4%) were cultivator, 2 patients (4%) were service holder, 1 patient (2%) was businessman and 1 patient (2%) was retired person. Twenty seven patients in this study presented with solitary nodular goitre (54%), ten patients with multinodular goitre (20%), two patients with adenomatous goitre (4%) and eleven patients with thyroid carcinoma with or without metastasis. Out of eleven patients of thyroid cancer 9 had papillary carcinoma (81.81%) and 2 (18.19%) had follicular carcinoma. Out of 9 cases of papillary carcinoma one patient presented with neck node metastasis.

Papillary carcinoma is the commonest thyroid malignancy, constituting 50 percent of all thyroid cancer with a male to female ratio is 1:36 and in this series it was much higher (81.81%) than that found in standard textbook (60%) In this series, commonest thyroid disorder was solitary nodular goitre with an overall incidence of 54%.

Hemithyroidectomy was performed in 31 patients, 26 with solitary nodular goitre affecting one lobe and two patients with adenomatous goitre and three patients with papillary carcinoma. Subtotal thyroidectomy was carried out in 9 patients of multinodular goitre. Total thyroidectomy was done in 6 cases of thyroid cancer and near total thyroidectomy was done in 01 case of multinodular goitre. Isthmusectomy was done in one case of solitary nodular goitre and completion thyroidectomy was done in one case of follicular carcinoma. Total thyroidectomy with modified radical neck dissection was done in one patient of papillary carcinoma with neck node metastasis.

Out of 50 cases, 6 cases (12%) developed post operative complications. Of these, 2 patients developed post operative hemorrhage. It was due to oozing from remaining thyroid tissue and wound surface which was managed by cauterization with bipolar diathermy after exploration of wound.

During operation, haemorrhage can be avoided by positioning the patient with the neck hyper extended and the head of the operating table elevated at 30°.

This positioning provides excellent exposure and reducing cervical venous pressure. Substantial blood vessels in the operative field should be tied with fine silk ligature, whereas small vessels can be managed with the bipolar diathermy⁷. Most surgeons favours the use of a small caliber closed suction drain for the first 24 hours to remove blood and serum from the operative bed.

Khaky et al⁸. in his study showed that the overall complication rate for combined surgeries was 14.2% with recurrent laryngeal nerve injury more common than hypoparathyroidism.

In this series 2 patients had unilateral recurrent laryngeal nerve paralysis. Among 2 patients, 01 patient showed gradual improvement of voice in subsequent follow up and after 3 months his voice was almost normal by compensation of the opposite vocal cord. One other patient did not show significant improvement even after an average period of 3 months follow up. Transient paralysis may result from pressure on the nerve by oedema in which cases recovery can be anticipated. Iqbal et al⁹ found only one recurrent laryngeal nerve damage out of 111 cases of Thyroidectomy (0.9). Lalida et al⁵, found the incidence of recurrent laryngeal nerve paralysis among 361 patients was 6.09%.

Transient paralysis occurs in about 3 percent of nerve at risk and recovers in 3 weeks to 3 months². The intra-operative nerve monitoring with the purpose of identification of the recurrent laryngeal nerve is a safe and reliable method. Lalida found that, the failure in identifying the nerve did not show significant correlation with incidence of permanent recurrent laryngeal nerve paralysis⁵.

The incidence of hypoparathyroidism is as high as 20 percent when total thyroidectomy and neck dissection is performed and as low as 0.9 percent for subtotal thyroidectomy⁶. But in this series only one patient (2%) developed transient parathyroid insufficiency on 2nd post operative day which was improved later on.

It is rarely the result of inadvertent removal of all parathyroid gland but more commonly due to disruption of their blood supply. Devascularization can be minimized by careful ligation of branches of inferior thyroid artery on the thyroid capsule distal to their supply of parathyroid glands.

Parathyroid glands usually situated in the posterior border of the thyroid gland but Clark et al¹² reasoned

that parathyroid glands situated anterior to the thyroid gland are at highest risk of injury. Injury to the gland during dissection is usually accompanied by a change in colour of the gland from tan to black purple. If the gland is devascularized, it should be removed and minced into 1 mm slices. After histological verification of parathyroid tissue, the minced gland is auto transplanted into sterno-mastoid muscle or the forearm¹².

The incidence of hypoparathyroidism is also directly related to the surgeons experience with thyroidectomy. The incidence of permanent hypoparathyroidism following total thyroidectomy ranges from 0.6 to 17% in reports^{12, 13}. Bhattacharyy N et al¹⁴ observed in their study, postoperative hypocalcaemia is the most common immediate surgical complication of total thyroidectomy. Out of 50 patients, 01 patient developed wound infection which was managed by exploration and removal of absorbable catgut followed by secondary stitch. There was no death in this series.

Conclusion

The incidence of major post operative complications like haemorrhage, recurrent laryngeal nerve damage, hypoparathyroidism and also mortality depends on the extent of surgery. The overall incidence of post operative complications in this series was 12%. Out of 50 cases, 2(4%) patients developed haemorrhage and 2(4%) patients showed unilateral vocal cord paralysis. One patient showed gradual improvement of voice and recover after 3 months, other patient did not show significant improvement. One patient (2%) showed transient tetany on 2nd post operative day which was improved later on. One patient developed wound infection that healed up on removing the infected catgut followed by secondary stitch.

Surgery of thyroid gland can be performed safely in the majority of patients. A thorough knowledge of potential surgical complications is mandatory for the thyroid surgeon. Successful surgical management of thyroid disease is also based on a sound knowledge of normal and pathologic anatomy and an unhurried, gentle operative technique.

Conflict of interest: We have no conflict of interest.

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