ORIGINAL RESEARCH

A Study on Post Operative Complications of Thyroid Surgery

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ABSTRACT

Background:The postoperative consequences of thyroid surgery have long been recognisedbygoitre surgeons. These problems may be serious enough to endanger the patient's life or cause physical or physiological limitations. Given the severity of the consequences, they must be kept to a minimum in this age of contemporary surgery. Moreover, for surgery to remain a dominating treatment option for thyroid illness, its complications must be less than other effective treatments. Aim: objectives of this study is to investigate preoperative factors that influence complication rates, complication rates linked with thyroid surgery type, problem types, complication onset time, complication duration, complication management.

Materials and Methods: The current study lasted 18 months from January 2019 to July 2020. Princes Esra Hospital, Deccan College of Medical Sciences, Hyderabad. The study included a prospective analysis of 80 goitre surgeries. These cases were clinically investigated and recorded using the attached proforma.

Results: A study of 80 goitres having surgery(cases that underwent goiter surgery) revealed Thyroid problems affect women more than men. The hospital saw the most patients in their third decade. Multinodular Goitre in Euthyroid Status was the most common clinical diagnosis. The most prevalent histology diagnosis was Nodular Colloid Goitre. Subtotal thyroidectomy was the most common procedure for goitre. Complications after surgery included wound infection. This trial had no fatality and little morbidity. It is possible to do thyroid surgery with little morbidity and mortality for a wide range of thyroid illnesses if done gently with thorough attention to hemostasis and structural features.

Keywords:
Thyroidectomy,Hypoparathyroidism,Hypothyroidism,Hemorrhage,Recurrent Laryngeal Nerve Palsy

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INTRODUCTION

Thyroid surgery is one of the most often performed surgical procedures in the world for the treatment of both benign and malignant disorders of the thyroid gland.

The thyroid gland is intimately associated with numerous essential structures, and as a result, it presents a particular challenge to the surgeon.

But until the latter half of the nineteenth century, thyroid surgery remained a dangerous procedure with prohibitive mortality rates (>40 percent). Then, advances in general

anaesthesia, antisepsis, and hemostasis enabled surgeons to perform thyroid surgery with significantly reduced mortality and morbidity rates.[1-4]
It is being attempted to research the numerous complications of thyroid surgery because some of the consequences are life-threatening.

Objectives

1. Preoperative factors which influence complication rates
2. Complication rates associated with the type of thyroid surgery
3. Type of complications
4. Period of onset of complications(time interval between surgery and complications)
5. Hospital stay of patient with different complications of thyroid surgery.
6. Mode of management of each complication

MATERIALS & METHODS

The present study of "Postoperative complications of Thyroid Surgery"has been made over a period of 18 months from January 2019 to July 2020.The study was made in Princes Esra Hospital attached to Deccan College of Medical Sciences, Hyderabad.
Prospective analysis of 80goitres undergoing surgery were taken for the study. These cases were studied in detail clinically and recorded as per the proforma attached.

Methods of collecting data:
Sample size: Minimum of 40 casesand 40 control.
Sampling method: Simple random sampling
Inclusion criteria: All patients who are posted for thyroid surgery in Princes Esra Hospital.
Exclusion criteria: Patients with previous thyroid surgery and anaesthetic complications.

Methods:
The details of the patient were recorded according to the proforma. The chief complaints were recorded in a chronological order and the history asked in detail along with past history familial history personal history.
The mode of onset of Goitre, its progression, whether associated with pain, sudden enlargement of the swelling were asked in detail. The cosmetic effects of the swelling and its impact on the routine life were recorded.
In the history special preference was given to the symptoms suggestive of hyper/hypo thyroidism, symptoms suggestive of pressure effects like dysphagia,stridor,dysphonia.The medication history was also taken and history of previous irradiation was also taken.
The patients were then examined in detail.
The General Physical Examination was done with attention to anaemia, icterus, clubbing, lymphadenopathy, edema, height, weight,BMI, facies etc.
The Local Examination was divided into four parts; inspection, palpation, percussion and auscultation.
On inspection the site,size, shape, surface, extent, borders, skin over and around the goitre were noted. Movement upwards on deglution was given special importance.
On palpation,the tenderness and local rise of temperature(if any) were noted. The inspector findings were confirmed. The consistency of the goitre along with nodules (if any) were noted. Thyroid fixity was checked.The tracheal position was confirmed. The carotid pulsations were checked for their position.Cervical lymph node areas were palpated.
On percussing the manubrium sternum retrosternal extension or mediastinal lymphadenopathy was noted.

Auscultation of the thyroid gland especially at the superior poles for bruit was done. The various eye signs of thyrotoxicitywas checked in selected patients.

The Systemic Examination was done where the cardiovascular,nervous(including the spine),respiratory and the abdomen systems were examined in detail with special attention to any signs of metastasis.

After examination the patient was subjected to relevant investigations.Routine investigations like Hb%,bleedingtime,clottingtime,RBS,Urea,Creatinine,Urine Routine, Chest X-ray,Electrocardiogram were done.

Plain X-ray of the neck in antero-posterior views and lateral views were taken to look for tracheal deviation or compression.Chest X-ray for retro-sternal extension was done.Thyroid Profile(T3,T4,TSH) were done to know about the hormonal status.FNAC was done in all cases to establish the histological diagnosis.Ultrasound neck was done in selected cases only. Indirect Laryngoscopy was done routinely in all cases to look for vocal cord status.

The preoperative treatment consisted of correction of co-morbid conditions(if any) and maintenance of euthyroid status. In this study all patients were non-diabetic. Depending on the diagnosis appropriate surgery was done.

During surgery utmost precaution was taken to preserve the nerves and the parathyroid glands.Attention was paid to meticulous hemostasis and whether the trachea was softened(in long standing goitres). Drains were kept in all cases.

Movements of the vocal cords were noted at the end of operation. The operated specimen was sent for histopathological examination for confirmation of the clinical diagnosis in every case.Postoperatively patients were observed in the recovery room,for reactionary hemorrhage and respiratory distress.Patients were examined for signs of hypocalcemia and relevant investigations like serum calcium were ordered in cases of suspected hypocalcemia.

All patients were treated with antibiotics postoperatively. Suction drains were placed in all cases and usually removed after 48 hours.

Routinely sutures were removed in all cases by 6th or 7th postoperative day.Patients were discharged on the same day.Regular follow up was done in all cases.

All patients were followed up regularly to look for signs of hyper/hypo thyroidism.In those patients who had evidence of voice change or hoarseness,Indirect Laryngoscopy was done.

Appropriate investigations like thyroid profile, serum calcium were done during the follow up period as required.

RESULTS

The present study was done in 80 patients who were admitted and operated in Princes Esra Hospital attached to Deccan College of Medical Sciences, Hyderabad during the study period from January 2019 to July 2020.

Table 1: Age Distribution

Age (in years)	Female	Male	Total	Percentage
10-19	2	1	3	3.75
20-29	14	2	16	20
30-39	12	2	14	17.5
40-49	25	2	27	33.75
50-59	4	0	4	5
60-69	7	3	10	12.5
70-79	5	1	6	7.5
Total	69	11	80	100

Among the 80 patients who underwent thyroid surgery,the youngest patient was 18 years of age and the oldest was74 years of age. The peak age group of individuals undergoing surgery was in the 3rd decade.

Sex Distribution

Table 2: ?

Sex	Number of cases	Percentage
Female	69	86.25
Male	11	13.75

Out of the 80 cases studied, 69 were females and 11 were males with a sex ratio of F:M=6.27:1

Table 3: Clinical Diagnosis

Clinical diagnosis	Number of Patients	Percentage
Solitary nodular goitre	27	33.75
Multinodular goitre	48	60
Toxic multinodular goitre	5	6.25
Total	80	100

In the present series, most of the goiters were clinically diagnosed as multinodular goiters (60 %). Next most common diagnosis was Solitary nodule goiters(33.75 %).

Table 4: Histopathological Diagnosis

Diagnosis	Number of Patients	Percentage(%)
Colloid Goitre	6	7.5
Multinodular Goitre	26	32
Nodular Colloid Goitre	25	31.25
Benign neoplasia	12	15
Malignant neoplasia	4	5
Hashimoto’s Thyroiditis	8	7.5
Nodular Hyperplasia	1	1.25
Total	80	100

Out of the 80 cases operated,the histopathological report was as follows:25 cases were Nodular colloid goitre, 26 cases were Multinodular goitre,6 cases were Colloid goitre,12 cases were Benign neoplasia(Follicular adenoma),4 cases were malignant(Papillary carcinoma),8 cases were Hashimoto’s thyroiditis,1 case was Nodular hyperplasia.

Table 5: Radiological Findings

X-ray neck	Number of Patients	Percentage
Normal Pretracheal soft tissue	75	93.75
Antero-posterior compression	2	2.5
Tracheal Deviation	3	3.75
Retrosternal Extension	0	0
Calcification	0	0
Total	80	100

Out of 80 cases, the trachea was normal in 75 patients, anteroposterior compression was found in 2 cases and tracheal deviation in 3 patients. The patients who had abnormal findings had longstanding goitres or large goitres.

Table 6: Type of Surgical Procedure

Operative Procedure	Number of Patients	Percentage
Sub-total thyroidectomy	39	48.75
Hemi-thyroidectomy	26	32.5
Total thyroidectomy	12	15.0
Near total thyroidectomy	3	3.75
Total	80	100

Out of the 80 cases, Subtotal Thyroidectomy was the most common procedure(48.75 %),followed by Hemi-thyroidectomy (32.5%),and Total Thyroidectomy.

Table 7: Complications of Thyroid Surgery

Type of Complication	Number of Patients	Percentage of total cases
Wound infection	8	10
Seroma	5	6.25
Hypoparathyroidism	2	2.5
Hemorrhage	1	1.25
Transient RLN palsy	1	1.25
Hypothyroidism	3	3.75
Stitch Granuloma	1	1.25
Total number complications	21	26.25

Wound infection

In this study wound infection was the most common complication.8 patients had wound infections.The incidence rate of infection was 10%.Infection was managed by antibiotics and dressings.

Seroma

In the present series seroma was found in 5 patients.The incidence rate was 6.25 %.It was aspirated in all the cases and appropriate antibiotics were initiated.

Transient Hypoparathyroidism

In this study Transient Hypoparathyroidism was seen in 2patients.The incidence rate was 2.5%.Calcium supplements and vitamin-D was administered and the patients recovered.

Hemorrhage

In the present series,hemorrhage was seen in only 1(1.25%)patient.It was observed in the operating room itself when the patient was about to be shifted to the recovery room.The wound was reexplored and hemostasis was achieved.

Transient Recurrent Laryngeal Nerve palsy

In this study there was only 1 case of Transient Recurrent Laryngeal Nerve palsy.It was treated with corticosteroids.

Hypothyroidism

In the present series there were 3 patients who developed hypothyroidism. The incidence rate was 3.75%.They were diagnosed during routine follow up.L-Thyroxine was started in all those patients.

Stitch Granuloma

In this study,there was only 1 case of stitch granuloma.The patient complained of serous discharge from the wound. Regular dressings and antibiotics did not improve the condition. The wound was re explored and the offending material was removed.

DISCUSSION

The Thyroid gland is situated in the portion of the neck where it is closely related to numerous important structures. The accidental injury to any one of these vital structures can result in mortality or morbidity. Hence the operating surgeon should take utmost precaution while dissecting these structures.

The complications arising after thyroid surgery can be classified as intra-operative complications and immediate post-operative complications and late post-operative complications.

The successful thyroid surgery requires skill and patience from the surgeon,theanaestheticteam,and all others involved in giving holistic healthcare to the patient.

In the present study spanning 18 months (January 2019-July2020),there were 80 thyroid surgeries performed and 28 complications were documented.The mortality in this series was zero. All the complications were appropriately managed with satisfactory patient outcome.

Wound infection

The incidence of wound infection in the present series was 6.25 %.It is considerably high compared to the other studies.

The wound infection was noted mainly on the 6th or 7th postoperative day.Earliest seen on the 5thpostoperative day(2 patients).There was erythema and induration around the suture line,associated with tenderness.[5]

The most fluctuant part of the swelling was drained by removing the overlying sutures.Pus was sent for culture sensitivity and broad-spectrum antibiotics were initiated and subsequently changed as per the culture reports.All the infections were superficial,and wound healing was achieved by secondary intention.[6,7]

The average duration of hospital stay was 16.8days and the maximum duration was 18 days (in 2 patients).

Most of the infections were seen after subtotal thyroidectomy(8 patients),1 infection in near total thyroidectomy and 1 infection in hemithyroidectomy. Most patients had gotitre for more than 2 years(5 out of 10 patients).Most patients had goitre whose with one of the dimensions was more than 5cm(7 out of 10 patients).Most patients were more than 30 years of age(8 out of 10 patients).

Seroma

The incidence of seroma formation in the present series was 5.7%.This is comparable to the Kowalski series. Seromas was detected around the 8thpostoperative day(3 out of 6 cases). 8 The earliest seroma was detected on the 7th postoperative day. The average duration of hospital stay was 16.1 days. 61The maximum duration of hospital stay was 18 days.9 Most of the seromas were seen after subtotal thyroidectomy(4 out of 6 patients),1 in total thyroidectomy,1 in hemithyroidectomy. All the cases which developed seromas had goitres

whose with one of the dimensions was greater than 6 cm. All the seromas were aspirated and appropriate antibiotics were started.Healing was seen in all cases.

Hypoparathyroidism

In the present study,the incidence rate of hypoparathyroidism was 3.75% with 2 patients developing temporary hypoparathyroidism. The clinical features developed after the 3rd postoperative day in all patients.The patients mainly complained of circum-oral numbness and tingling sensation.On examination carpo- pedal spasm was seen in 1 patient.Serum calcium was decreased in all the patients.[5-7]

All the patients were administered calcium, and vitamin-D supplements.All the patients recovered. All the cases of hypoparathyroidism was seen in those who underwent total thyroidectomy.All the cases were temporary hypoparathyroidism because subsequent follow up showed normal serum calcium levels.This was attributed to temporary spasm of the vessels supplying the parathyroid glands and hence the resulting tetany.

Hemorrhage

In the present series hemorrhage was seen in 1 patient.The incidence rate was 1.25 %.This is comparable to the Bhattacharya series. The patient had underwent total thyroidectomy for multi-nodular goitre. 5The patient was in the operating room itself and was about to be shifted to the recovery room when it was noted that the drain was high.It was decided to re-explore the wound and bleeding was from the superior pedicle on the left side.The bleeding was controlled and the wound closed once again with adrain. The post-operative stay in the hospital was 11days.

The incidence of recurrent laryngeal nerve palsy in the present series was 1.25 %,with only 1 patient developing that complication.This is comparable to the Bhattacharya series.[5,6]

The patient had underwent Total Thyroidectomy for Multinodular goitre.It was a young male patient.

The patient developed hoarseness of voice on the 2ndpost-operative day.An indirect laryngoscopy was done and on the left side the vocal cord mobility was restricted.The patient was put on corticosteroids and vitamins.The patient recovered in 4 days.[10]

The patient stayed in the hospital for 14 days.Before discharge a repeat indirect laryngoscopy was done and vocal cord mobility was found to be normal bilaterally.The cause of palsy was attributed to neuropraxia.

The incidence of post-operative hypothyroidism in this study was 3.75 %(3 patients).This is not concordant with the other studies.This is because of the short period of follow up(the maximum period of follow up in this series was 12 months).The average period of follow up being 6.75 months.[11]

The patients were routinely followed up and examined for signs of hypothyroidism both clinically and biochemically.All patients had thyroid profile suggestive of hypothyroidism.All the patients were put on Thyroxine tablets.[12]

Out of the 3patients,2 had undergone Total Thyroidectomy and 1 patient had undergone near total thyroidectomy.Of the3 patients 1 patients had toxic symptoms pre-operatively.The average duration for the detection of hypothyroidism in this series was 6.8 months.The earliest being 3 months.

Stitch Granuloma

There was 1 case of stitch granuloma out of the 80 cases operated.The incidence rate being 1.25%.The patient had undergone sub-total thyroidectomy for Hashimoto thyroiditis.

The patient complained of serous discharge from the wound site 6 wk after the surgery.The patient was put on antibiotics and anti-inflammatory agents along with regular dressings.But

there was no improvement.It was decided to explore the wound.On surgery the offending silk suture was removed.The patient recovered afterwards.

Suture granuloma is a rare complication of thyroid surgery and is known to occur after the use of non-absorbable suture materials deep within the skin. The pathogenesis of suture granulomas involves two steps. The first step is the initial reaction of the tissue, which reflects the amount of injury inflicted by the passage of the needle. After the initial reaction subsides, the second step occurs. In this step, the suture material causes specific inflammatory reactions. Suture granuloma is clinically important in cancer patients because it can mimic tumorrecurrence.

Duration of Hospital stay (post-operative)

	Number of patients	**Percentage (%)**
5-9 days	60	75
10-14 days	8	10
>15 days	12	15

Most of the patients were discharged within 5-9 days after surgery. Patients who had complications had their hospital stay extended for upto 18 days (Maximum in 1 patient).

Follow up

All 80 cases were followed up. The average follow up period was 6.5 months with the maximum being 12 months.

CONCLUSION

The following results were reached as a result of the research conducted at the Deccan Medical Collaborative in Hyderabad. The research was conducted between January 2019 and July 2020.

1. The incidence of thyroid diseases is more common in females than in males.
2. The third decade was the decade in which the greatest number of patients presented to the hospital.
3. Multinodular Goitre in Euthyroid Status was the most often seen clinical diagnostic in patients with goitre.
4. Nodular Colloid Goitre was the most often encountered histological diagnosis in the tissues submitted for Histopathological investigation.
5. Subtotal thyroidectomy was the most often performed procedure in the treatment of goitre.
6. The most prevalent postoperative consequence was a wound infection, which was the most severe.

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