ORIGINAL RESEARCH PAPER

Surgery

TO STUDY AND ANALYZE VARIOUS POSTOPERATIVE COMPLICATIONS OF THYROID SURGERY - ORIGINAL ARTICLE

KEY WORDS: QR Code, Bharat QR Code, Digital Payment, Cashless Payment

DR.BONI. TATARAO M.S (ENT) ASSOCIATE PROFESSOR DEPARTMENT OF OTOLARYNGEOLOGY NRI MEDICAL COLLEGE,VISAKHAPATNAM , ANDHRAPRADESH INDIA

DR.AKKIDAS. SUVARCHALA M.S (GENERAL SURGEON) ASSISTANT PROFESSOR DEPARTMENT OF SURGERY ANDHRA MEDICAL COLLEGE ,VISAKHAPATNAM, ANDHRAPRADESH, INDIA

ABSTRACT

INTRODUCTION: Thyroid surgery is considered major surgery and is usually performed by endocrine or senior surgeons. Though mortality is rare, morbidity continues to exist and is the major concern. Complications when they occur have serve implications for the patient. AIMS AND OBJECTIONS: To study and analyze various postoperative complications of thyroid surgery.To study complication rates associated with the type of thyroid surgery.**METHODS:**The details of clinical history were recorded according to the proforma as soon as the patient with thyroid disease was admitted. The preoperative treatment consist of correction of anaemia and control of toxicity and maintenance of euthyroid state in patients with thyrotoxicosis. **OBSERVATIONS AND RESULTS:** In this study analyzed in detail observation of various postoperative complications following different thyroidectomy procedure in 50 patients **Clinical diagnosis:** 22 cases were multinodular goiter (44%), 2 cases were toxic MNG (4%), 1 was Graves disease (2%), 17 cases were solitary nodules of thyroid (34%^), 5 cases were malignant goiter (10%), 2 cases were Hahimoto's thyroiditis and 1 was colloid goiter. Commonest indication for surgery was mutlinodular goiter followed by solitary nodule of thyroid.**Types of surgical procedure:** Hemithyroidectomy was being carried out for benign solitary nodule of thyroid.Subtotal thyroidectomy was carried out in patients with Multinodular Goiter, Colloid goiters, Hashimoto's thyroiditis and it is the most common surgical procedure. Near-total thyroidectomy was done in graves disease and toxic multinodular goiter. Total thyroidectomy was done in Malignant goiters. In this series there was no mortality and morbidity rate was 20%.Hypocalcemia was the most commonly observed post-operative complication in this study and was seen in 6 out of 50 cases. Hematoma, recurrent laryngeal nerve palsy, seroma, wound infection was seen in one case each.Total thyroidectomy was associated with 3 cases of hypocalcemia. Subtotal thyroidectomy was associated with 2 cases of hypocalcemia, 1 case of hematoma, 1 case of RLN palsy, 1 case of seroma. Near total thryroidectomy was associated with 1 case of hypocalcemia and 1 case of wound infection. Hemithyroidectomy was not associated with any of complications. **CONCLUSION :** Thyroid surgery is safe and can be performed with minimal morbidity and mortality for a wide range of diseases of the gland. Thyroidectomy often offers the best means of permanent cure with properly selected cases.

INTRODUCTION

Thyroid surgery is considered major surgery and is usually performed by endocrine or senior surgeons. Though mortality is rare morbidity continues to exist and is the major concern. Therefore a thorough knowledge of potential surgical complications is mandatory for every thyroid surgeon[1,2,3,4] An accurate performance of operation in thyroid requires experience and technical ability and tests the dexterity and finesse of the surgeon.

In spite of all the advances in surgery and anesthesia a modification of surgical techniques, thyroid surgery is still fraught with dangers some of them are life threatening and some though not life threatening continue to prevail troublesome particularly in permanent form. By virtue of anatomical variations in course of recurrent laryngeal nerve and position of parathyroid complications are prone to occur in best of surgical hands. Some of the complications endangers life and demand immediate intervention. Hence an attempt is made to study the various complications of thyroid surgery.

AIMS AND OBJECTIONS

- To study and analyze various postoperative complications of thyroid surgery.
- To study complication rates associated with the type of thyroid surgery.

METHODS

The details of clinical history were recorded according to the profarma as soon as the patient with thyroid disease was admitted. The presenting symptoms were recorded in chronological order, a relevant past history, drug history, family history, etc, were enquired into every case. A detailed history for compressive (pressure) symptoms such as dysphagia, dysphonia, dyspnea were recorded. History suggestive of altered hormonal status for e.g. hypothyroidism and hyperthyroidism were enquired into and recorded. FNAC was done routinely USG neck was done in selected causes. The preoperative treatment consisted of correction of anaemia and control of toxicity and maintenance of euthyroid state in patients with thyrotoxicosis.

During surgery utmost care was taken to preserve parathyroid glands. Nerves were routinely exposed and handled to bare minimum. Attention was paid to meticulous hemostasis and intraoperative assessment for softening of trachea in case of long standing goiters was done.

The operated specimens were sent for histopathologic examination for confirmation of clinical diagnosis in every case.

OBSERVATIONS AND RESULTS

In this study prospectively analyzed in detail observations of various postoperative complications following different thyroidectomy procedures in 50 patients during the period from november 2014 to october 2016

Age distribution:
The youngest age in the present series was 18 years and the oldest was 62 years. The peak age group of individuals undergoing thyroid surgery was in third to fourth decade 60% of patients were distributed in 30 ± 10 years range. The mean age was 37 years.

Sex distribution:
Out of 50 cases studied, 45 cases were females and 5 cases were males, with sex ratio with 9:1

Mode of presentation:
44 cases out of 50 cases (88%) presented with swelling as the only symptom.

3 cases had pressure symptoms like dyspnea and dysphagia along with swelling.

3 cases had palpitations associated with swelling.
The most commonly found sign was movement of the swelling with deglutition.

Clinical diagnosis:
One of 50 cases who underwent surgery, 22 cases were multinodular goiter (44%), 2 cases were toxic MNG (4%), 1 was Graves disease (2%), 17 cases were solitary nodules of thyroid (34%^), 5 cases were malignant goiter (10%), 2 cases were Hahimoto's thyroiditis and 1 was colloid goiter. Commonest indication for surgery was mutlinodular goiter followed by solitary nodule of thyroid.

Types of surgical procedure
Hemithyroidectomy was being carried out for benign solitary nodule of thyroid. Subtotal thyroidectomy was carried out in patients with disease of Multinodular. Goiter, Colloid goiters, Hashimoto's thyroiditis and it is the most common surgical procedure. Near-total thyroidectomy was done in graves disease and toxic mutlinodular goiter. Total thyroidectomy was done in Malignant goiters.

Incidence of post operative complications :
Table-1: Showing Incidence of post operative complications

S.No.	Post operative complication	No. of cases	Percentage(%)
1	Hypocalcemia	6	12
2	Hematoma	1	2
3	Recurrent laryngeal nerve palsy	1	2
4	Seroma	1	2
5	Wound infection	1	2
6	Tracheomalacia	0	0
7	Thyroid storm	0	0
8	Chyle leak	0	0
9	Hypothyroidism	0	0
10	Recurrent goiter	0	0
11	Others	0	0

In this series, there was no mortality and morbidity rate was 20%. Hypocalcemia was the most commonly observed post-operative complication in this study and was seen in 6 out of 50 cases. Hematoma, recurrent laryngeal nerve palsy, seroma, wound infection was seen in one case each.

Intervention procedures performed:
No intervention procedure was required in 41 out of 50 cases (82%). Oral calcium and Vitamin D therapy combined with intravenous calcium gluconate were instituted in 6 cases who showed evidence of both clinical and biochemical hypocalcemia. All patients were advised to continue oral calcium supplements at discharge.

One patient had hematoma at surgical site which was evacuated by opening the skin suture. One patient had seroma which was aspirated with wide bore needle.

One patient showed evidence of RLN palsy which was temporary, and at 2 weeks patient underwent ENT examination and was normal.

Different operative procedures and their complications:
Table – 2 : Different operative procedures and their complications

Type of Surgery	Type of Complication										
	Hypocalcemia	Hematoma	RLN palsy	Seroma	Wound infection	Tracheomalacia	Thyroid storm	Chyle leak	Hypothyroidism	Recurrent goiter	others
Hemithyroidectomy	0	0	0	0	0	0	0	0	0	0	0
Sub-total thyroidectomy	2	1	1	1	0	0	0	0	0	0	0
Near-total thyroidectomy	1	0	0	0	1	0	0	0	0	0	0
Total thyroidectomy	3	0	0	0	0	0	0	0	0	0	0

Total thyroidectomy was associated with 3 cases of hypocalcemia. Subtotal thyroidectomy was associated with 2 cases of hypocalcemia, 1 case of hematoma, 1 case of RLN palsy, 1 case of seroma. Near total thyroidectomy was associated with 1 case of hypocalcemia and 1 case of wound infection. Hemi thyroidectomy was not associated with any of complications.

Table – 3 : Relationship of diagnosis with the occurrence of complications

Type of Surgery	Type of Complication										
	Hypocalcemia	Hematoma	RLN palsy	Seroma	Wound infection	Tracheomalacia	Thyroid storm	Chyle leak	Hypothyroidism	Recurrent goiter	others
Multinodular goiter	2	1	1	1	0	0	0	0	0	0	0
Toxic multinodular goiter	0	0	0	0	1	0	0	0	0	0	0
Grave disease	1	0	0	0	0	0	0	0	0	0	0
Benign solitary nodule of thyroid	0	0	0	0	0	0	0	0	0	0	0
Malignant goiters	3	0	0	0	0	0	0	0	0	0	0
Hashimotos thyroiditis	0	0	0	0	0	0	0	0	0	0	0
Colloid goiter	0	0	0	0	0	0	0	0	0	0	0

Malignancy was associated with increased proportion of complications being 3 cases of hypocalcemia. Multinodular goiter is responsible for most number of complications including 2 cases of hypocalcemia. 1 case each of hematoma, seroma and RLN palsy.

Hypocalcemia is seen in one case of graves disease and wound infection is seen in a case of toxic multinodular goiter.

Days of stay:
In this study 38 cases had 5-7 days of stay,2 cases had 1-4 days stay, 10 ccases had 8-10 days stay

DISCUSSION

Fifty patients who underwent various thyroidectomy procedures were studied to analyse the occurrence of different post operative complications following surgery .1,2,3,4,5

Statistical analysis of these cases has been made which is mentioned in the observation tables with reference to several parameters and conclusions are drawn from them. A comparison with the series of others has also been done.

In this study minimum patient age was 18 years and maximum was 62 years. The average age was 37 years.

Taking sex incidence, the male female ratio was 1:9, in stojadinovic series, the ratio is 2:8 and in shandilya series, the ratio is 2.3:7.7.

In this study 44 out of 50 patients presented with a neck. Swelling as the sole complaint i.e., 88%, 3 patients had both swelling and pressure symptoms and 3 patients had swelling and palpitations.

The most common diagnosis in this study was multinodular goiter seen in 22 patients (44%), followed by solitary nodule of thyroid (n=17) and malignant goiter (n=5).

Table – 4: comparison of histological diagnosis with other studies

Authors	Malignant	Benign
Rix	10%	90%
+Sakorafas	27%	73%
Sasson	52%	48%
Present study	10%	90%

Surgery :

Of the 50 cases who underwent surgery hemithyroidectomy was carried out in 17 case and 25 cases underwent subtotal thyroidectomy. Near total thyroidectomy was done in 3 cases, total thyroidectomy was done in cases.

Hematoma
Table – 5 : Hematoma

S. No.	Author	Year	Number of operation	Percentage
1	Wade J.S.H	1954	139	1.3
2.	Nerg,ascjo R	1998	1192	1.6
3	Bhattacharya N.	1999	517	1.0
4	Cormelin J.H.	1997	405	1.2
5	Gould et al.	1965	1000	1.2
6	Foster et al.	1978	24108	0.66
7	Mandl et al.	1965	2200	0.45
8	Catell et al.	1949	1000	2.7
9	Bearh's eet al.	1956	1021	0.19
10	Catell and morgan.	1939	5956	0.5
11	Present series	2013	50	2

The incidence of post-operative hematoma varies from 0.1-2.7% in table reported various series.6,7 In the present series hematoma occurred in 2% cases and accounted for 10% morbidity. This comparable to Catell (1949)49 series. Hematoma occurred in one patient, operated for multinodular goiter presented with no signs of respiratory distress as hematoma was superficial to strap muscle. Patient had fullness in neck with 300 ml of blood collected in the suction drin. On exploration there was hematoma formed due to slippage of ligature from the anterior jugular vein, which was secured.

Recurrent laryngeal nerve paralysis
Table – 6 : Recurrent laryngeal nerve paralysis

S. No.	Authors	Year	No. of cases	RLN palsy-transient	RLN palsy – Permanent
1	Bergmaschi	1998	1192	2.9	0.5
2	Ridell	1970	1700	0.88	1.7
3	Martrenso's	1985	514	6.4	6.6
4	Beahrs and salusky	1991	513	2.1	2.3
5	Gonzales	1968	377	0	0.26
6	Mclntosh	1976	221	6.3	0.45
7	Wade J.S.H	1954	119	2.8	-
8	Present study	2013	50	2	0

In the present series none of our patients had permanent recurrent laryngeal nerve palsy or bilateral recurrent laryngeal nerve palsy.[8,9,10,11,12]

One case of temporary recurrent laryngeal nerve injury occurred in this study. Recurrent laryngeal nerve paralysis occurred on the right side. In this case, there was transient impaired abduction of the right vcal cord on extubation. This patient did not have any postoperative stridor, but had mild dysphonia. This patient received neurotrophic vitamins and patient had vocal cord movements recovered at 2 weeks follow up. This case may be attributed to neuropraxia which could have occurred during mobilization of the gland.

The rate of temporary RNL paralysis is comparable to Beahrs and Salusky2 study and Ridell 36 series. In this series we have not encountered bilateral recurrent laryngeal nerve paralysis or permanent laryngeal nerve paralysis probably due to small (50) number of cases studied and it is comparable to Wade series.

Prevelance of post-thyroidectomy hypocalcemia
Table – 7 : Prevelance of post-thyroidectomy hypocalcemia

S. No.	Authors	Years	No. of case	Transient Hypocalcemia	Permanent Hypocalcemia
1	Bergmaschi	1989	1192	20	4
2	Gonzales	1991	335	10	8
3	Cormelin J.H	1997	405	6.2	3.6
4	Sugrue et al.	1981	306	2.96	1.96
5	Michie et al.	1971	266	0.75	1.76
6	Present series	50	12	0	

In this series this was the most common presentation occurring in 6 cases accounted for 60% morbidity. Three cases (50%) occurred in malignant goiters subjected to total thyroidectomy and two cases occurred in subtotal thyroidectomy for multinodular goiters, one case seen after near total thyroidectomy done for graves disease.

Most of them manifested as clinical tetany and had serum calcicum below the normal range. All of them were transient and responded promptly to calcium supplementation and recovered with normal calcium levels prior to discharge from hospital.

The rates of permanent hypocalcemia is lower in this group probably due to small number of patients undergoing procedures like total thyroidectomy.[13,14]

Wound infection
Table – 8 : Wound infection

S. No.	Authors	Year	No. of cases	Percentage
1	Gonsalez	1991	335	0.2

2	Bhyattacharya	1995	517	0.2
3	Gould et al.	1958	1000	1
4	Wade J.S.H	1954	119	7.5
5	Bergmaschi	1989	1192	0.5
6	Present series	2013	50	2

The incidence of wound infection was 2% in this series. It was a superficial infection which was managed with antibiotics. Seroma occurred in one case which was aspirated under aseptic conditions. The mean postoperative stay in this study was 7.18 days. All the cases were operated under general anaesthesia.

Follow-up

All 50 cases were followed-up on out patient basis at one week after surgery and subsequently at 3 month intervals. The duration of follow-up varied from – three months to two years. Follow-up consisted of clinical examination and investigations found necessary.

CONCLUSION : Thyroid surgery is safe and can be perfomed with minimal morbidity and mortality for a wide range of diseases of the gland. Thyroidectomy often offers the best means of permanent cure with properly selected cases. Though mortality has decreased morbidity continues to exist by virtue of anatomical variations of structures, complications are prone to occur in best of Surgical hands which can be minimized by meticulous attention, identification and preservation of structural details.

LIST OF ABBREVATIONS USED

1	TSH	THYROID STIMULATING HORMONE
2	TBG	THYROID BIBNDING GLOBULIN
3	RAIU	RADIOACTIVE IODINE UPTAKE
4	CT	COMPUTER TOMOGRAM
5	BMR	BASAL METABOLIC RATE
6	MTC	MEDULLARY THYROID CARCINOMA
7	MEN	MULTIPLE ENDOCRINE NEOPLASIA
8	USG	ULTRASONOGRAM
9	PTU	PROPYLYTHIOURACIL
10	EMG	ELECTROMYOGRAPHY
11	IDL	INDIRECT LARYNGOSCOPY
12	FNAC	FINE NEEDLE ASPIRATION CYTOLOGY
13	T3	TRIODOTYRONINE
14	T4	TETRAIODOTYRONINE
15	EBSL	EXTERNAL BRANCH OF SUPERIOR LARYNGEAL NERVE
16	RLN	RECURRENT LARYNGEAL NERVE
17	S. No.	SERIAL NUMBER
18	M	MALE
19	F	FEMALE
20	TT	TOTAL THYROIDECTOMY
21	NTT	NEAR TOTAL THYROIDECTOMY
22	STT	SUBTOTAL THYROID3ECTOMY
23	HT	HEMITHYROIDECTOMY
24	R	RIGHT
25	L	LEFT
26	STN	SOLITARY THYROID NODULE
27	MNG	MULTINODULAR GOITER
28	TMNG	TOXIC MULTINODULAR GOITER
29	PT	PRIMARY THYROTOXICOSIS
30	PC	PAPILLARY CARCINOMA
31	CG	COLLOID GOITER
32	HT	HASHIMOTOS THYROIDITIS
33	NC	NO COMPLAINTS
34	OCA	ORAL CALCIUM
35	VD	VITAMIN D
36	CaG	CALCIUM GLUCONATE

REFERENCES

1. Barret, R.M. et al. 1997, "Complications of Throid Surgery". Int. Surggery. 82:63-66.
2. Bearhs et al. 1956, "Complication of Thyroid Surgery". J. Clin. Endocrinol Metab. 16:456-69.
3. Becourn, G and Bermaschi, R. July 1998, "Morbidity of Thyroid Surgery". American Journal of Surgery. 176(1):71-75.
4. Bergnashi. R. et al. July 1998, "Morbidity of Thyroid Surgery". Am J. Surg. 7176(1):71-75.
5. Bhattacharya, N., Fried, M.P. April 2002, "Assessment of Morbidity and Complications of total Thyroidectomy", Arch. Oto Laryngol. Head and Neck Surg. 128:389-392.
6. Caldarelli, D.D., Hollinger, L.D. 1980, "Complications and Sequelae of thoyroid surgery", Oto Rhinolaryngology Clinics of North America. 13:85-97.
7. De Roy et al. Jan. 1995, "Complication of thyroid surgery". Ann. Surg. Oncology. 2(1):50-60.
8. Caludio R. Cemea et al. Sept/Oct 1992. "Surgical Anatomy of external branch of the superior laryngeal nerve", Arch. Oto laryngol Head and Neck Surg. 380-381.
9. Cernea, C.R. et al. 1992, "identification of external branch of supralaryngeal nerve during thyroidectomy", American Journal of Surgery. 164:634-638.
10. Martenson, H., Jerins, J. 1985. "Recurrent Laryngeal Needle Palsy in. Thyroid Surgery Related to Operations and Nerves at Risk". Arch. Surg. 120:475-477.
11. Kirner, A.C., Aigner, M., Burian, M., March 1998. "The External Branch of the Superior Laryngeal Nerve". Arch Otolarvngol Head Neck Surg. 124:301-303.
12. Riddell, V. 1970. "Thyroidectomy: Prevention of Bilateral Recurrent Nerve Palsy". BJ.S. 57:1-10.
13. Bourrell, C. et al. July 1993. "Transient Hypocalcemia after Thyroidectomy", Annal of Otorchinolargyngology. 102(7):496-501.
14. Falk, A.S., Birken E.A., Baran, D.T. Feb. 1988, "Temporary post thyroidectomy Hypocalcemia". Arch. Otolaryngol. Head Neck Surg. 114:168-174.