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A Comparision of Suturless Thyroidectomy versus Convetional Thyroidectomy in Benin Thyroid Tumour

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Abstract

Background: Thyroid gland is known to be a highly-vascularized organ so rapid and effective hemostasis is a critical step of the surgical procedure. The thyroid's job is to make thyroid hormones, which are secreted into the blood and then carried to every tissue in the body. The aim of this study was to compare the outcome of the use of the suture-less technique and conventional thyroidectomy in benign thyroid tumour.

Material and Methods: A comparative prospective hospital based study on 60 patients were complaining of thyroidal disease with need to surgical treatments attending in Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner during 12 months period.

Results: Our results showed that pre-operative and post-operative serum calcium level were not significant in between groups. The comparison of mean value of operative time, intraoperative bleeding & post-operative drainage volume were statistically significant ($P<0.0001$*** respectively) in between groups.

Conclusion: The present study concluded that the use of Sutureless thyroidectomy as the procedure of choice for treatment of thyroid diseases as it had shorter operative time, overall complications rate and good function results.

Keywords: Thyroid nodule, Suture-less technique, Thyroidectomy

Introduction

In 1920, W. F. Becker given the principles of safe and efficient thyroid surgery.[1] They consist of three basic phases: identification and ligation of vessels, identification and preservation of laryngeal nerves, and parathyroid glands. Basic surgical instruments are not significantly changed; the main innovations are new methods of coagulation and vascular section.

In India the prevalence of benign thyroid tumors in the community is about 12.2%, according to a recent study.[2] However, thyroid cancer is quite rare, and the incidence is 8.7 per 100000 people per year, though this seems to be increasing over the years.[3]

The thyroid gland is a butterfly-shaped endocrine gland that is normally located in the lower front of the neck. The thyroid's job is to make thyroid hormones, which are secreted into the blood and then carried to every tissue in the body.The term thyroid nodule refers to an abnormal growth of thyroid cells that forms a lump within the thyroid gland. Although the vast majority of thyroid nodules are benign (noncancerous), a small proportion of thyroid nodules do contain thyroid cancer.One modality of treatment for thyroid disorders is surgery which is offered in the form of lobectomy, subtotal thyroidectomy, and total thyroidectomy. Surgery is often needed for toxic adenoma, endemic multinodular goiter with pressure

symptoms, toxic diffuse or multinodular goiter not responding to medical therapy and for suspicious or confirmed malignancy[4]. Subtotal and total thyroidectomy are time consuming tasks that require careful dissection and meticulous hemostasis to avoid per operative blood loss, recurrent laryngeal nerve injury, life threatening post-operative hematoma formation leading to air way obstruction and hypocalcemia[5].A careful hemostasis prohibits bleeding in the site of surgery enabling the surgeon to have a clear and dry operative field. Hence, it decreases the potential trauma to parathyroid glands and laryngeal nerves, also it reduces potential risky postoperative bleeding[6]. Hemostasis achieved with classic methods such as tie and clamp, electrocautery, clips or glue of fibrin is time consumption and loaded with hazard of knot slipping, unsettlement and thermal trauma[7].

Vascular Sealing Devices (VSD), used during last decade seal vascular structures by coagulating them. The coagulated vessels will be ready to be safely transected without need for additional ligation. Although, VSDs are not appropriate for big and main vessels, they still able to coagulate all vessels faced intraoperatively for surgery of thyroid gland. Nowadays with the major advent of energy devices such as ultrasonic coagulation (Harmonic Scalpel, Ethicon) and bipolar energy (LigaSure, Valleylab) for cutting and hemostasis introducing new methods of vessel ligation and division without increasing the risk of postoperative complications.[8] The aim of this study was to compare the outcome of the use of the suture-less technique and conventional thyroidectomy in benign thyroid tumour.

Material and Methods:

A comparative prospective hospital based study on 60 patients were complaining of thyroidal disease with need to surgical treatments attending in Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner during 12 months period.

Inclusion Criteria:

The patients were complaining of thyroid swelling which needs to surgical treatments

Exclusion Criteria:

1. Malignant thyroid tumor.
2. Patients with previous neck irradiation.
3. Patients with recurrent goiter

Methodology:

All patients who underwent total thyroidectomy signed and gave informed consent to be enrolled in the study divided in 2 groups.

1. Group I treated by sutureless technique (Bipolar technique)
2. Group II treated by conventional method.

Preoperatively, the patients were clinically and biochemically evaluated, in addition to vocal cord mobility checking. All surgical procedures were performed under general anesthesia with endotracheal intubation. After division of platysma muscle, cervical lineaalba has opened. Very large goiters necessitated division of strap muscles. The lobe of thyroid gland was progressively dissected away from strap muscles, its vascular pedicles was ligated with Vicryl 2/0 suture or coagulated. The thyroid lobe progressively dissected off trachea after the recurrent laryngeal nerves and parathyroid glands has been identified and dissected off the thyroid capsule. After securing hemostasis, a suction drain had routinely put in the thyroid bed as a part of the study protocol to measure amount of blood loss during the first 48 hrs. The cervical lineaalba and platysma muscle has closed with Vicryl 3/0 and the skin closed by an intracutaneous running suture.

Preoperative data concerning age, gender, thyroid pathology and preoperative serum calcium were

prospectively recorded. The surgical time were estimated in minutes from incision of skin to skin closure. The postoperative evaluation comprised analysis of both, the characteristics of preoperative and postoperative parameters (operative time, drainage volume, postoperative serum calcium levels, surgical complications (laryngeal nerve palsy, hypoparathyroidism, bleeding and wound infection), length of hospital stay.

Results:

Table 1: Demographic profile of both groups

Demographic profile	Suture-less technique (group I)	Conventional methods (group II)
Age		
Minimum	46.10±3.294	43.10±5.762
Residence		
Rural	15	12
Urban	15	18

Table 2: Diagnosis of patients in both groups

Diagnosis	Suture-less technique (group I)	Conventional methods (group II)
Colloidal Goiture	9	6
Follicular adenoma	9	9
Multinodular Goiture	3	12
Solitary thyroid nodules	9	3
Total	30	30

Table 3: Serum calcium level in patients in both groups

Serum calcium	Suture-less technique (group I)	Conventional methods (group II)	P value
Pre-operative	9.880±0.459	9.810±0.392	0.528 NS
Post-operative	9.690±0.456	9.660±0.378	0.782 NS

Table 4: Operative outcomes in patients in both groups

Operative outcomes	Suture-less technique (group I)	Conventional methods (group II)	P value
Operative time	44.5 minutes	68.5 minutes	<0.0001**
Intra-operative blood loss	55.50 ml	112 ml	<0.0001**
Post operative drainage volume	6.7 ml	24.50 ml	<0.0001**

The present study showed that mean age of patients in group I and group II was 46.10±3.294 & 43.10±5.762 respectively and mostly patients were urban as compare to rural but non-significant (table 1). Mostly patients diagnosed was follicular adenoma 18 (30%), followed by colloidal goiture & multinodular goiture was 15 (25%) each and solitary thyroidal nodular was 12 (20%) (table 2).

Our results showed that pre-operative and post-operative serum calcium level were not significant in between groups (table 3).

The comparison of mean value of operative time, intraoperative bleeding & post-operative drainage volume

were statistically significant (P<0.0001*** respectively) in between groups (table 4).

Discussion:

Total thyroidectomy is considered one of the most commonly performed surgical procedures. Thyroid gland is known to be a highly-vascularized organ so rapid and effective hemostasis is a critical step of the procedure.[9] with the appearance and major developments in energy device such as ultrasonic coagulation systems (e.g., Harmonic Scalpel (Ethicon, Washington) SonoSurg (Olympus Medical, Tokyo, Japan) and LigaSure (Valleylab Inc, Boulder, Colorado) this lead to improvement of the result of surgery and reduce complications rate.[10] The result of this study showed that Sutureless thyroidectomy using harmonic focus significantly reduced operative time, intraoperative blood loss & Post-operative drainage volume.

The present study, mean age of patients in group I and group II was 46.10±3.294 & 43.10±5.762 respectively. Waqas Aziz et al (2016)[11] analyzed the mean age in HS group of 42 years (SD=9) and CS group of 43 years (SD =9.8).

Wael Barakaat et al (2017)[12] observed that the mean age for sutureless thyroidectomy was39.85±8.47 years and for conventional group was 43.17±9.69 years.

Mostly patients in our study was diagnosed is follicular adenoma 18 (30%), followed by colloidal goiture & multinodular goiture was 15 (25%) each and solitary thyroidal nodular was 12 (20%). Waqas Aziz et al (2016)[11] found that mostly patients have multinodular goiter.

Our study showed that 24 minutes reduction in HS group when compare to CS group.Melck AL & Wiseman SM (2010)[13] found that HS reduced operative time by 23.1 minutes.

Ecker T et al (2010)[14] found that the mean operating time reduction for the harmonic scalpel was equivalent to 22.67 minutes (P < 0.00001) or nearly 25 percent of the total operating room time.

Emanuele Ferri et al (2011)[15] found that average operative time was significantly shorter in the HS group (44.9 ± 8.3 minutes) compared with the CH group (69.5 ± 10.7 minutes).

Our study observed that intra-operative blood loss in HS group was 55.50 ml and 112ml in CS group. Ecker T et al (2010)[14] found that when harmonic scalpel was used, blood loss was reduced significantly by 20.03 mL (P < 0.00001).

Waqas Aziz et al (2016)[11] found that mean post-operative bleeding in HS thyroidectomy was significantly lower as compared to the conventional thyroidectomy group (18.2 ml vs.76.0 ml, P< 0.001). Hence, mean operative time and mean post-operative bleeding in thyroidectomy with HS was less as compared to conventional thyroidectomy.

The post-operative drainage in our study was 6.7 ml in HS group & 24.50 ml in CS group. Emanuele Ferri et al (2011)[15] observed that total drainage fluid volume were lower in HS than in CH (37.4 ± 2.4 versus 56.1 ± 4.2).

Conclusion: The present study concluded that the use of Sutureless thyroidectomy as the procedure of choice for treatment of thyroid diseases as it had shorter operative time, overall complications rate and good function results.

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