



Comparison of Hypocalcemia between Conventional Suture Thyroidectomy and Harmonic Sutureless Thyroidectomy

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Abstract

Background- *Thyroidectomy is one of most common surgeries performed by the general surgeon. Total thyroidectomy is the surgical treatment for thyroid cancer, toxic MNG and many benign thyroid diseases. Recurrent laryngeal nerve injury and hypocalcemia are the common complications observed in post thyroidectomy patients. Of these hypocalcemia is most common complication. Hypocalcemia may result from removal of parathyroid gland or glandular ischemia resulting thereof.*

Methods: *This study compared the post operative outcomes following conventional suture thyroidectomy with sutureless thyroidectomy with harmonic scalpel. In particular the occurrence of post-op hypocalcemia(temporary and permanent) were studied*

Results: *108 patients underwent thyroidectomy for varied indications. The incidence of temporary hypocalcemia was found to be more frequent in sutureless thyroidectomy. But the incidence of permanent hypocalcemia not found to be significantly different among the two groups.*

Conclusion: *With equal incidence of permanent hypocalcemia in both the groups, harmonic sutureless thyroidectomy can be a good substitute for conventional suture thyroidectomy in modern era.*

Keywords: *thyroidectomy, hypocalcemia, harmonic scalpel, complications, sutureless.*

Introduction

Thyroid is an endocrine gland located in the lower neck. Thyroid surgery is one of the most commonly performed surgical procedures in our hospital. It includes hemi-thyroidectomy (lobectomy) and total thyroidectomy. Total thyroidectomy is the surgical treatment for thyroid cancer, toxic MNG and many benign thyroid diseases^(1,7).

Thyroid surgery is safe now unlike in the past years, because of the availability of bipolar cautery and harmonic scalpel⁽²⁾. In our hospital, there was a 20-25% increase in thyroid surgeries from 2013 to 2015. In spite of these developments, the potential complications following thyroidectomy are Recurrent Laryngeal Nerve Injury and hypocalcemia⁽¹⁰⁾, which may result in voice change and metabolic changes in the bone.

Between these two complications, hypocalcemia is the most common, with an incidence of 0.5 to 50%⁽⁵⁾. Hypocalcemia can be either temporary or permanent. Permanent hypocalcemia is the persistence of hypocalcemia even after a period of 6 months even with Calcium and Vitamin D supplementation⁽³⁾. It is around 0.5 to 1% following total thyroidectomy. It occurs either due to parathyroid removal or ischemia to the parathyroid during thyroidectomy. Temporary hypocalcemia is more common which is around 15-45% of patients who underwent total thyroidectomy which settles within 6 months after surgery with Calcium and Vitamin D supplementation⁽⁴⁾. It is usually due to parathyroid manipulation during the thyroid surgery. The symptoms of hypocalcemia develops once the serum calcium level goes below 8 mg/dl. The common symptoms are tetany, carpopedal spasm, laryngospasm etc. Hence, detecting this hypocalcemia and timely treatment is important. This hypocalcemia usually develops two days after thyroidectomy. Here, we are comparing the development of hypocalcemia both temporary and permanent in conventional suture Total thyroidectomy and harmonic suture less Total thyroidectomy. The reliable biochemical test that identifies patients developing hypocalcemia is with serum calcium estimation. We measured serum calcium in the postoperative period and also after 6 months. Hence, the aim of the study is to compare the development of hypocalcemia (both temporary and permanent) following conventional suture thyroidectomy with harmonic sutureless thyroidectomy.

Material and Methods

The present study was conducted in Govt TD Medical College Hospital, Alappuzha, Kerala between January 2013 and December 2015. 108 patients who got admitted in the Department of General Surgery with thyroid swelling were included in this study.

Inclusion Criteria

1. Patients aged between 25 and 55 years.
2. Patients undergoing Total thyroidectomy.

Exclusion Criteria

1. Patients undergoing lobectomy.
2. Patients undergoing revision thyroidectomy.
3. Patients on calcium and Vitamin D supplementation for some other reason.

All the surgeries were performed by the senior surgeons, Assistant Professors and above, of the same unit. The complications of hypocalcemia following Total thyroidectomy was diagnosed with symptoms and serum calcium level less than 7.6 mg/ml. Severe hypocalcemia was treated immediately with calcium infusion whereas mild hypocalcemia was treated with oral calcium. The patients admitted in the first and third weeks were subjected to conventional suture thyroidectomy and the patients admitted on the second and fourth weeks were subjected to harmonic sutureless thyroidectomy.

The indications for thyroid surgeries were MNG, malignant tumors, toxic goiter, and colloid goiter. All the patients were operated under general anesthesia. Standard statistical methods were applied in analyzing the data using mean, standard deviation, chi-square test, t-test were applied. A p value less than 0.05 was taken as having statistical significance.

Observation and Results

108 patients included in the present study from the Department of General Surgery of Govt TD Medical College, Alleppey, Kerala, presented with thyroid swelling with different etiology. The minimum age for the entire study group was 25 years, maximum age was 55 years, and the mean age was 34.26 years. Of the two study groups, one group which had 51 members had a mean age of 32.21 years while the other group which had 57 members had a mean age of 36.1

years. The females were 87 in number while the males were 21 in number for the entire group. The t-value was calculated to be 1.92 while p-value was found to be 0.032, indicating that the data was very much statistically significant.

Among the different diseases encountered in the present study, the surgeries were done in multinodular goiter (41%), toxic goiter (11%), CA Thyroid (21%), Thyroiditis (9%), and other benign tumors (12%). The female-male ratio was calculated to be 4.14:1.

Pre-operative preparations were done with Thyroid Function Test, ultrasound scan, FNAC and Serum Calcium(6). The other investigations were done according to its indications like CT Scan, MRI.

Procedures undertaken were conventional suture thyroidectomy and harmonic sutureless thyroidectomy.

Table 1- Frequency distribution of age

N	Minimum Age	Maximum Age	Mean Age	Std Deviation
108	25	55	34.26	5.4

Table 2 – Frequency Distribution of Sex

Frequency Distribution of Sex		
Sex	Frequency	Percentage
Female	87	80.556%
Male	21	19.444%
Total	108	100.000%

Chart 1

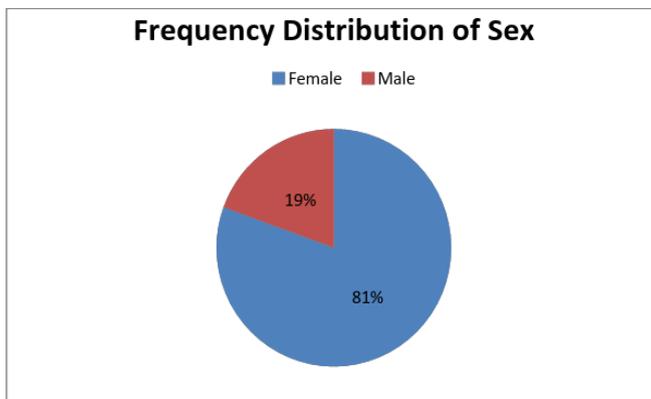
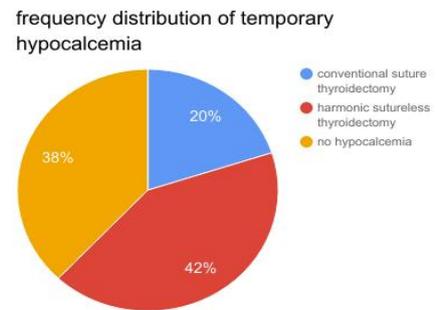


Table 3- Frequency Distribution of Temporary Hypocalcemia

Hypocalcemia	Frequency	Percentage
Conventional suture thyroidectomy	10	20
Harmonic sutureless thyroidectomy	24	42

Chart 2



In both the above cases, other than the percentage mentioned, the rest are not having hypocalcemia.

Table 4 Distribution of Permanent Hypocalcemia:

Permanent Hypocalcemia	Percentage	Frequency
Conventional suture thyroidectomy	1.10%	1.188
Harmonic sutureless thyroidectomy	1.20%	1.296

Harmonic Sutureless Thyroidectomy



Conventional Suture Thyroidectomy



Discussion

In this study we tried to compare postoperative hypoparathyroidism between conventional suture thyroidectomy and harmonic sutureless thyroidectomy. Theodor Kocher did the first thyroidectomy in 1889⁽⁹⁾. The major two complications in thyroidectomy are recurrent laryngeal nerve palsy and hypoparathyroidism. To avoid this complication the surgeon should prepare the patient properly for surgery and the Thyroid function test must be normal. we should also improve our anatomical knowledge about various positions of parathyroid glands and surgical skill with modern energy devices like bipolar and harmonic scalpel. Hypocalcemia can be reduced by specifically identifying and preserving parathyroid glands with intact blood supply⁽⁸⁾. In the present study the incidence of hypocalcemia is compared with conventional suture thyroidectomy and harmonic sutureless thyroidectomy. A transient or permanent hypoparathyroidism develops following the devascularization or by the accidental removal of parathyroid glands. Sutureless thyroidectomy can be performed either with bipolar or using harmonic device. Here we are comparing between the conventional suture thyroidectomy with harmonic sutureless thyroidectomy

Conclusion

The main aim of this study is to compare the

incidence of hypoparathyroidism between conventional suture thyroidectomy and harmonic sutureless thyroidectomy. Different anatomical positions of parathyroid gland is the challenge for the thyroid surgeon to avoid postoperative hypocalcemia. Hypocalcemia was observed in : Of total patients 20% developed temporary hypocalcemia following conventional suture thyroidectomy and 42% patients following harmonic sutureless thyroidectomy and 1.1% developed permanent hypocalcemia following conventional suture thyroidectomy and 1.2% developed permanent hypocalcemia following harmonic sutureless thyroidectomy. Therefore, the incidence of temporary hypocalcemia is more with harmonic sutureless thyroidectomy compared with conventional suture thyroidectomy. But the incidence of permanent hypocalcemia following both harmonic sutureless thyroidectomy and conventional suture thyroidectomy are the same. Hence, harmonic sutureless thyroidectomy can be a good substitute for conventional suture thyroidectomy in modern era.

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