ORIGINAL ARTICLE

Comparison of Frequency of Clinical Tetany between Truncal Ligation and Peripheral Ligation of Inferior Thyroid Arteries in Subtotal Thyroidectomy

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ABSTRACT

Aim: To compare the frequency of clinical tetany in patients undergoing subtotal thyroidectomy with truncal ligation and peripheral ligation of inferior thyroid arteries.

Methods: This was a randomized controlled trial study done in Department of Surgery, Mayo Hospital, Lahore, from 01-01-2011 to 30-06-2011 (six months duration). Patients having simple multinodular goiter, colloid multinodular, goiter, toxic controlled multinodular goiter of both gender between 20-60 years of age were included in the study and patients having cancer of thyroid, recurrent goiter, single lobe enlargement, and who did have preoperative laboratory and clinical hypocalcaemia or any skeletal pathology and who had received preoperative and postoperative blood transfusions were excluded from study. One hundred patients fulfilling the inclusion criteria were selected from ward by lottery method and their informed consent was taken. Their demographic data was collected. A total of 100 patients were eligible for the study. There was no ethical issue in the procedure as both truncal ligation and peripheral ligation of inferior thyroid arteries are accepted internationally. Patients in group A (n=50) underwent ligation of the peripheral branches of the inferior thyroid arteries. In group B (n=50) these arteries were ligated on main trunk. In all patients the operation was performed under gereral anesthesia. Patients were prepared for general anesthesia and subtotal thyroidectomy was performed.

Results: In the comparison of clinical tetany between both groups, only 2 (4%) patients in group A and 14 (28%) patients in group B developed clinical tetany which is statistically significant (p 0.003).

Conclusion: It is concluded that the peripheral ligation of inferior thyroid arteries decreases the chances of postoperative clinical tetany as compared to truncal ligation in subtotal thyroidectomy. Peripheral ligation of inferior thyroid artery is a safe and effective technique for subtotal thyroidectomy.

Keywords: Hypocalcaemia, Subtotal thyroidectomy, parathyroid hormone, Hypoparathyroidism, Calcium, Peripheral ligation, Truncal ligation

INTRODUCTION

Thyroid diseases are common worldwide and the surgery of thyroid gland is one of the frequent operations. First recorded thyroidectomy was performed by Albucasis in AD500 in Baghdad that was associated with catastrophic haemorrhage. Halsted are just few of names intimately associated with development and refinement of thyroid surgery. Thyroidectomy is a commonly performed operation for the treatment of the thyroid diseases. Multinodular goiter is one of the commonest thyroid disease encountered in the practice of surgery. The most common surgery being performed for multinodular goiter is subtotal thyroidectomy for the reasons that it is comparatively easier to perform, less time consuming and has a lesser complication rate especially of damage to recurrent laryngeal nerve and parathyroids.

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Hypocalcaemia of hypoparathyroidism is among the well-recognized complications of thyroid surgery and its incidence is a sensitive measure of the quality of thyroid surgery. The risk of complications depends on the extent of surgery, the nature of underlying disease and experience of surgeon. Postoperative hypocalcaemia commonly occurs after extensive thyroid surgery and may require calcium and/or vitamin D supplements to alleviate of prevent the symptoms. It results from direct injury to, devascularization of or accidental removal of parathyroid glands. Hypocalcaemia typically occurs at around 24-28hrs postoperatively. It is very unpleasant situation for the patient, when intensive it can be life threatening. It is known that all the blood supply to the four parathyroid glands comes from inferior thyroid artery, so it is logical inference that this procedure would increase postoperative hypocalcaemia. Some researches advance that none of the inferior thyroid arteries should be ligated in thyroidectomies of that, if they need to be ligated, that this be performed at the nearest point of entrance to the thyroid gland, in order to protect the parathyroid

branch of inferior thyroid arteries. In some studies, it was reported that truncal ligation of inferior thyroid arteries did not lead to damage to parathyroid functions. The incidence of clinical tetany is 14.42 percent in patients underwent truncal ligation and 2.38 percent in patients underwent peripheral ligation in thyroidectomies, so to avoid clinical tetany, inferior thyroid arteries must be ligated peripherally.

This study was conducted to compare clinical tetany between truncal ligation and peripheral ligation of inferior thyroid arteries in subtotal thyroidectomy, thus to decrease the postoperative clinical tetany, hospital stay, cost effectiveness by decreasing calcium and vitamin-D supplementation, decrease use of medications and decrease patients discomfort from symptoms to facilitate earlier return to work.

MATERIALS AND METHODS

This was a randomized controlled trial was conducted in the Department of Surgery, Mayo Hospital, Lahore during six months from 01-01-2011 to 30-06-2011. One hundred patients divided into two groups 'A' & 'B' comprising of fifty patients each group. Sample technique used was random sample technique by lottery method. Patients having simple multinodular goiter, colloid multinodular goiter, toxic controlled multinodular goiter of both gender between 20- 60 years of age were included in the study. Patients having cancer of thyroid, recurrent goiter, single lobe enlargement, and who did have preoperative laboratory and clinical hypocalcaemia or any skeletal pathology and who had received preoperative and postoperative blood transfusions were excluded from the study.

Data collection: One hundred patients fulfilling the inclusion criteria were selected from ward by lottery method and their informed consent was taken. Their demographic data was collected. A total of 100 patients were eligible for the study. There was ethical issue in the procedure as both truncal ligation and peripheral ligation of inferior thyroid arteries are accepted internationally. Patients in group A (n=50) underwent ligation of the peripheral branches of the inferior thyroid arteries. In group B (n=50), these arteries were ligated on main trunk.

In all patients the operation was performed under general anesthesia. Patients were prepared for general anesthesia and subtotal thyroidectomy was performed by consultant. The patients were evaluated for symptoms and signs of clinical tetany and serum calcium level on the 1, 2, 3rd postoperative days. This information was recorded on pre-designed proforma (Annexure) attached.

Data analysis: The data was entered in SPSS version 15 and analyzed. Age, sex, clinical tetany and postoperative hospital stay were the variables of study. Descriptive statistics were calculated. Mean and standard deviation was also calculated for age. Frequency and percentage were calculated for sex al id clinical tetany. Chi square test was used to compare outcome between group A and group B for clinical tetany. The results were considered statistically significant if the p value was less than 0.05.

RESULTS

In our study, the age range was 20 to 60 years in both groups. In group A, 12 (24%) patients were between 20-30 years of age and in group B, 10 (20%) patients were in this age group. In group A, 14 (28%) patients were between 31-40 years of age and in group B 16 (32%) patients in this age range. 18(36%) patients were in group A and 17 (34%) patients were in group B between 41-50 years of age. Only 6 (12%) patients were in group A and 7 (14%) patients in group B were in age range 51- 60 years. Most of the patients were in both groups between 41-50 years of age The Mean±SD age was 41.43:t9.63 in group A and 40.33:t1 0.48 was in group B. P value 0.004.

In this study, 11(22%) patients were male in group A and 9(18%) patients were male in group Band 39(78%) patients were female in group A and 41(82%) patients were female in group B. Male to female ratio was 1:3.54 in group A and 1:4.55 in group B .P value 0.005

This study shows the comparison of clinical tetany between group A and B as in group A, only 2(4%) patients were found having clinically tetany and in group B 14(28%) patients were clinical symptoms of tetany which is statistically significant (p 0.003).

Our study also shows the comparison of complications according to their sex. No male patient in group A and 1(2%) male patients in group B showed complications. In group A, 2(4%) patients of female and in group B 13(26%) patients were female who had complications which are statistically significant (p 0.005).

DISCUSSION

Subtotal thyroidectomy is a very good therapeutic option for patients with simple multinodular goiter, toxic control goiter, euthyroid goiter and diffuse goiter. It is a safe and fast method with very low mortality and excellent results[5].

Our study showed the age range was 20-60 years between both groups. The mean±standard deviation was 41.43±9.63 in group A while the

mean±standard deviation was 40.33±10.48 in group B which is comparable with the other studies done by different authors in Pakistan and other countries as under.

A study carried out by Tekin among the 34 patients who underwent total thyroidectomy 9(26.5%). The mean age of subjects was 49.3±12.3 years and 25(73.5%) were females[8].

The present study shows the most of the patients were female in both groups. 11 (22%) patients were male in group A and 39 (78%) patients were female in group A while in group B there was 9 (18%) patients were male and 41 (82%) were female. Male to female ratio was 1:3.54 in group A and 1:4.55 in group B which is comparable with other studies.

In a study reported by Chaudhary total of 310 patients were operated, majority of them being female. Most of the patients were presented as female[5]. In another study done by Tekin there were 9(26.5%) were men and 25(73.5%) were females. In this study most of the patients were female as compare to male[9]. Another study conducted by Khan there was 46(92%) were females in group A while in group B 48(96%) were females[3].

In a study reported by Lin there was no statistical difference in the age and sex of the patients who had temporary hypocalcaemia, permanent hypocalcaemia or no hypocalcaemia. [19] This supports the findings of Glinoer but contrasts with the study by Prim[10] who found hypocalcaemia was statistically more common in females.

In our study we compared the frequency of clinical tetany between two groups. There were only 2(4%) had clinical tetany in group A and there were 14(28%) patient had clinical tetany in group B. In comparison between group A and B, the group A showed better results and less complications rate as compare to group B which is statistically significant difference between group A and group B (p=0.003). Similarly in our study the postoperative hospital stay was shorter in group A as compare to group B.

In different studies done by various authors although the development of postoperative hypocalcaemia is likely to be multifactorial in nature, thyroid lobectomy alone is hardly ever associated with this complication.[12-14]. To avoid postoperative clinical hypocalcaemia in subtotal thyroidectomy, ITAies must be ligated peripherally. The peripherally ligated group will have a lower prevalence of clinical hypocalcaemia and a reduced period of hypocalcaemia.

CONCLUSION

The peripheral ligation of inferior thyroid arteries decreases the chances of postoperative clinical tetany as compared to truncal ligation in subtotal thyroidectomy.

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