Original Article

Thyroidectomy& Its complication

Comparison of Post-operative Drain Insertion versus No Drain after Total Thyroidectomy

Muhammad Akram Dogar, Adeel Riaz and Ammarah Afzal

ABSTRACT

Objective: To compare insertion of post-operative drain versus no drain in patients undergoing total thyroidectomy in terms of operative time, hospital stay and frequency of post-operative complications.

Study Design: Randomized controlled trial.

Place and Duration of Study: This study was conducted at the Department of General Surgery, Central Park Teaching Hospital, Lahore from 1st July 2016 to 30th June 2017.

Materials and Methods: Sixty two patients of benign multinodular goiterwere included in the study. Patients were randomly divided into two equal groups of 31 patients each by lottery method. In Group A, a redivac suction drain was inserted after total thyroidectomy while Group B post-operative drain was not placed. Mean operative time, hospital stay and postoperative complications between the two groups were compared.

Results: The mean operation time was 73.16±10.15 minutes in Group A while it was 61.23±8.61 minutes in Group B(p=0.000). The mean hospital stay was 2.42±0.50 days in Group A while it was 1.44±0.53 days in Group B(p=0.000).The mean pain score in Group A was 4.77±0.99 while in Group B it was 3.23±1.12(p=0.000). The difference in complications (hematoma, seroma and surgical site infection) was non-significant (p=0.641).

Conclusion: Total thyroidectomy for benign multinodular goiter without post-operative drains had a less operative time, lesser hospital stay and was associated with less post-operative pain as compared to patients with postoperative drain insertion. The complication rate between the two groups was comparable.

Key Words: Thyroidectomy, Operative time, Drain, Complications, Hematoma, Seroma.

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INTRODUCTION

The earliest description of thyroid surgery for goiter dates back to year 952 AD by Albucasis. Roger Frugardiiof Salerno school of surgery performed the first thyroidectomy and described the procedure in his book Practica Chirurgiae. Thyroid surgery was revolutionized by Theodore Kocher who standardized the procedure to reduce the mortality rate to 1% in the late 19th century for which he received a Nobel Prize in 1909.[1] Safety of performing thyroid surgery got a major boost with the introduction of hemostatic devices like Harmonic scalpel and LigaSure and it is the commonest endocrine surgical procedure performed in the world nowadays.[2] Due to its location in close proximity to the major blood vessels in the neck, surgery of thyroid gland requires strict control of hemostasis to avoid postoperative complications especially hematoma formation.[3]

The more conservative options of thyroid surgery like near-total and sub-total thyroidectomy are associated with increased incidence of recurrence. The redo surgery predisposes the patients to high rate of complications and most of the patients undergoing conservative procedures still require thyroxine supplementation.[4] Total thyroidectomy is therefore considered as the procedure of choice in patients presenting with both benign conditions like Graves' disease and multinodular goiter and also for most of the cases of thyroid carcinoma.[5,6] Post-operative drain insertion is a routine practice in most of the hospitals across the country. Drains are inserted to reduce the tissue dead space and are used as prophylaxis against the development of hematoma which is a major dreaded complication following thyroid surgery.[7]

More recently the routine insertion of postoperative drains has been questioned by head and neck surgeons from across the world with the argument that drains did not prevent complications rather the ensuring meticulous hemostasis after surgery was all that mattered.[8] The advocates against the use of drains argue that the incidence of post-operative bleeding and hematoma following thyroid surgery is only 0.1-1.1%.[9] In addition, Insertion of drain not only increases post-operative pain and discomfort but it also prolongs the

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hospital stay significantly thereby increasing the costs and it has also been reported to increase the incidence of surgical site infections.[10]

The aims of our study was to compare post-operative insertion of drain versus no drain in patients undergoing total thyroidectomy in terms of operative time, hospital stay and frequency of post-operative complications. The rationale of this study being the scarcity of data available in the national literature with only one study comparing total thyroidectomy with drain versus no drain.[11,12] Earlier studies have also yielded conflicting results regarding comparison of two groups. The findings of my study will help adopt the better evidence based technique with less post-operative pain, shorter hospital stay and less post-operative complications which are beneficial outcomes in the management of these patients.

MATERIALS AND METHODS

This randomized controlled trial was conducted in the Department of General Surgery, Central Park Teaching Hospital, Lahore from 1st July 2016 to 30th June 2017 on patients who underwent total thyroidectomy on elective operation list for benign multinodular goiter. The inclusion criteria comprised of diagnosed cases of multinodular goiter belonging to both genders, having age between 20 to 65 years, ASA class I, II and III, and a normal thyroid profile (euthyroid). Patients with the diagnosis of thyroid cancers, ASA class IV and V, previous history of neck surgery including thyroid surgery, deranged coagulation profile and comorbid illnesses like ischemic heart disease, hypertension and diabetes mellitus were excluded from the study. A total of 62 patients were included and they were divided in two groups. Each group comprised 31 patients. Patients were grouped randomly by using the lottery method into two equal groups consisting of 31 patients each. All the patients who were diagnosed as cases of benign multinodular goiter by detailed history, thorough clinical examination, ultrasound neck, FNAC of thyroid and laboratory investigations including thyroid function tests and had normal thyroid function tests (Euthyroid) were included in the study. We performed total thyroidectomy by the standard conventional vascular ligature technique in all patients. The team was headed by a professor/ associate professor assisted by post graduate residents.

In Group A patients, a Redivac suction drain of size 14/16 F was placed after total thyroidectomy beneath the deep cervical fascia after the removal of whole of thyroid tissue and hemostasis. Drain output was measured in the post-operative period after every 12 hours. Suction would be maintained and confirmed by charging the drains. Drains were removed if the drain output did not increase in a 12 hour period after first post-operative day. While in group B patients, post-operative redivacdrain was not placed. The operative time of all patients was documented in minutes from the start of the surgery till the application of last skin suture. All the patients were followed after surgery for post-operative pain according to the VAS (Visual Analogue Score). The VAS was determined by first teaching the patients about the score and was then documented as expressed by the patients. The documentation of pain score was done after 24 hours of surgery. The hospital stay was calculated from the time of completion of surgery till discharge from the hospital in days. Post-operatively patients were also followed for the development of hematoma, seroma and surgical site infections on the 1st, 7th and 14th post-operative days. The final assessment and recording of post-operative complications was made on the 14th post-operative. The data was analyzed using SPSS-20..

RESULTS

The mean age of patients included in the study was 43.05±8.61 years. In Group A (drain group), the mean age of patients was41.97±8.30 years (range 31-58 years) while in Group B (no drain group), the mean age of patients was 44.13±8.91 years (range 32-60 years), the difference being statistically non-significant (p=0.327). Out of the total 62 patients included in the study, 48 patients (77.4%) were females and 14 patients (22.6%) were males with male to female ratio of the 1:3.43. The gender distribution amongst the two groups is shown in Figure 1. There was no statistical difference between the two groups in terms of gender (p=0.544).

The overall mean operative time of the study was 67.19±11.10 minutes. The mean operation time was 73.16±10.15 minutes (range 54-94 minutes) in Group A while it was 61.23±8.61 minutes (range 46-82 minutes) in Group B. The difference in the mean operative time between the two groups was found to be statistically significant (p=0.000). The overall mean duration of hospital stay of the study sample was 1.93±0.71 days. The mean hospital stay was 2.42±0.50 days (range 1.5-3.5 days) in Group A while the mean hospital stay was 1.44±0.53 days (range 1.0-3.0 days) in Group B. The difference in the mean hospital stay between the two groups was also found to be statistically significant (p=0.000). Post-operative pain score was documented as per the VAS after 24 hours of surgery. The mean pain score in Group A was 4.77±0.99 while in Group B it was 3.23±1.12. The difference between the groups was statistically significant (p=0.000). Complications were observed in 5 patients (8.06%) out of a total of 62 patients. Three patients (9.68%) belonged to Group A while 2 patients (6.45%) were from Group B. The difference in overall complications between the two groups was statistically non-significant (p=0.641). There was 1 patient (3.23%) in Group B, a 59 years old female who developed hematoma who was re-explored while there was no case of hematoma formation in Group A, the difference between the groups being

statistically non-significant (p=0.313). Two patients (6.45%) in Group A and 1 patient (3.23%) in Group B presented on the follow-up visit with seroma formation which were managed conservatively.

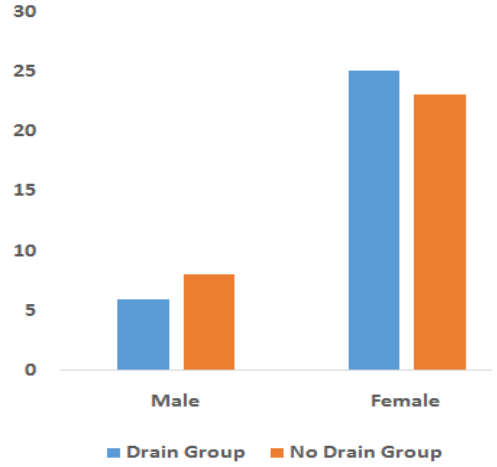

Figure No.1: Distribution of patients according to gender

Table No.1: Results of the study

Variable	Group A (n=31)	Group B (n=31)	p value
Age (years)	41.97±8.30	44.13±8.91	0.327
Gender (Male :Female)	6 (19.35%): 25 (80.65%)	8 (25.81%): 23 (74.19%)	0.544
Operation time (minutes)	73.16±10.15	61.23±8.61	0.000
Hospital stay (days)	2.42±0.50	1.44±0.53	0.000
Pain Score (VAS)	4.77±0.99	3.23±1.12.	0.000
Complications	3 (9.63%)	2 (6.45%)	0.641
Hematoma	0 (0%)	1 (3.23%)	0.313
Seroma	2 (6.45%)	1 (3.23%)	0.554
Surgical site infection	1 (3.23%)	0 (0%)	0.313

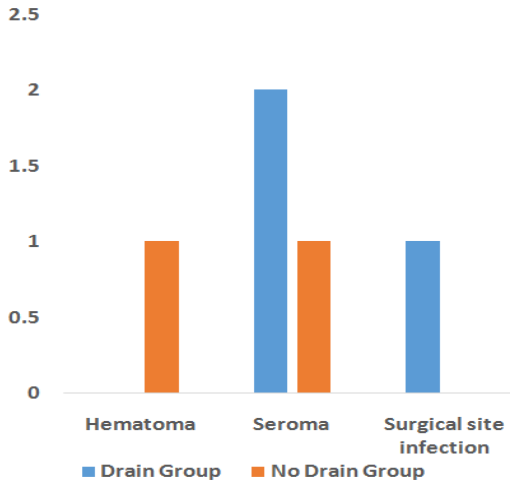

Figure No. 2: Distribution of complications between the two groups

The difference between the two groups was statistically non-significant (p=0.554). As regards surgical site infection, 1 patient (3.23%) in Group A developed surgical site infection which was managed by intravenous antibiotics. There was no case of surgical site infection in Group B. The difference between the groups in terms of surgical site infection was also statistically non-significant (p=0.313) [Table 1].The complications between the two groups are shown in figure 2.

DISCUSSION

Thyroidectomy is one of the most common endocrine surgery procedures performed worldwide. A search of local literature only yielded one study on drain versus no drain in patients undergoing thyroidectomy conducted by Nawaz et al.[11] The mean age of patients in our study was 43.05±8.61 years. The mean age was reported to be 37.94±8.96 years in a study by Ahmed et al[3], while Nawaz et al[11] reported a mean age of42±4.24 years. Similarly Mohialdeen et al[13] reported a mean age of 43±8.9 years in 2016 from Iraq. Our study showed a preponderance for female gender with 77.4% patients. Similarly Abaszadeh et al[14] and Mohialdeen et al[13] reported the frequency of female patients to be 79.4% and 75% in their studies respectively. A much higher percentage of 94.3% female patients was reported by Ahmed et al.[3]

The difference in the operative time between the drain and no drain groups was found to be significant (p=0.000). Abaszadeh et al[14] reported that the operative time in the no drain group was 131.94±38.85 minutes versus 147.22±39.31 minutes in the drain group, which was statistically significant (p=0.009). On the contrary a study by Chalya et al[15] reported that the mean operative time was 105.5±38.4 minutes in drain group versus 102.1±36.3 minutes in without drain group with a non-significant difference (p=0.756). Another study by Deveci et al[16] reported an operative time of 86.45±18.93 minutes in no drain group versus 88.80±21.33 minutes in drain groups with the difference being statistically non-significant (p=0.19).

The difference in the hospital stay between the groups was also found to be statistically significant in our study (p=0.000). A study by Kalemera-Ssenyondo et al[12] reported that the mean hospital stay was significantly higher in the drain group 2.41±0.89 days versus 1.71±0.76 days in without drain group (p= 0.0008). Nawaz et al[11] also reported that the mean duration of hospital stay was 3.63±0.707 days in the drain group vs 1.19±2.145 days in no drain group respectively which was statistically significant ($p<0.05$). Chalya et al[15] also reported that the mean hospital stay was 4.6±1.2 days in no drain group versus 7.4±2.6 days in the drain group, the difference being statistically significant (p=0.002).

Patients in our study reported a significantly higher pain score in the drain group after 24 hours of surgery (p=0.000). Similarly Nawaz et al[11] reported a significantly higher pain score of 6.09±0.7 in drain group versus a score of 4.12±0.42 in no drain group

after 24 hours. Deveci et al[16] also reported that the mean pain score after 24 hours was significantly higher in the drain group (3.09±0.77) versus the without drain group (2.08±0.74) with a p value of 0.001. Muthaa et al[17] also reported that the mean pain score was significantly lower in the without drain group (1.4±0.8) versus drain group (4.7±2.0) after 24 hours respectively (p=0.001).

Our study did not find any statistical difference in the overall as well as individual complications including hematoma and seroma formation or the development of surgical site infections between the two groups (p>0.05). Because of its rich blood supply and vital location in the neck, hematoma can become a life threatening emergency.[18] Drain insertion is mainly done to avoid this complication. Similar to our results a study by Kalemera-Ssenyondo et al[12] reported that the frequency of hematoma formation was 2.94% versus 0% (p=0.31), seroma formation was 8.82% versus 5.88% (p=0.64) and wound infection was 0% versus 0% (p=1.00) in the drain versus no drain groups respectively.

Chalya et al[15] reported that the frequency of complications in the drain group was 15.6% versus 13.3% in without drain group. The difference being statistically non-significant (p=0.218). Nawaz et al[11] also reported that the frequency of hematoma formation was 0% versus 1.47% (p>0.05), seroma formation was 1.7% versus 4.41% (p>0.05) and wound infection was 1.47% versus 0% (p>0.05) in the drain versus no drain groups respectively which were comparable results to our study. A meta-analysis by Tian et al[10] published in 2017 also reported that there was no statistically significant difference between the drain and no drain groups in terms of hematoma and seroma formation. However there was a significantly higher chance of developing surgical site infections in the drain group as compared to no drain group (p=0.012).

With the introduction of newer hemostatic devices like ligature small jaw and focus harmonic scalpel, the safety of thyroid surgery has increased and total thyroidectomy has become the standard procedure of choice in all the major centers in the world.[19,20] Keeping in view the results of our study and those compared above, total thyroidectomy can be performed without the insertion of post-operative drains. In this present era in which the practice of evidence based surgery has been emphasized from time to time, local evidence based guidelines need to be formulated. The limitation of our study was the small sample size of 62 patients. We recommend drain less thyroidectomy for reducing hospital stay, and post-operative pain. We also recommend further research on this topic with bigger sample size for assessment of better technique in terms of postoperative drain insertion or vice versa in the local population.

CONCLUSION

Total thyroidectomy for benign multinodular goiter without the insertion of post-operative drains had a less operative time, lesser hospital stay duration and was associated with less post-operative pain as compared to patients with postoperative drain insertion. The complication rate between the two groups was comparable. Meticulous dissection coupled with effective hemostasis was the determinant of preventing post-operative complications. Thus we recommend that post-operative drain insertion in not routinely required in total thyroidectomy.

Author's Contribution:

Concept & Design of Study:	Muhammad Akram Dogar
Drafting:	Adeel Riaz
Data Analysis:	Ammarah Afzal
Revisiting Critically:	Muhammad Akram Dogar, Adeel Riaz
Final Approval of version:	Muhammad Akram Dogar

Conflict of Interest: The study has no conflict of interest to declare by any author.

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