Thyroidectomy with and without Drains: A Clinical Comparative Study

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Abstract:

Background: Historically, drains have been employed in thyroid surgeries as a precautionary measure against potential complications such as hematoma formation and airway obstruction. Nevertheless, contemporary surgical practices have witnessed a departure from the routine use of drains, as this approach lacks universal acceptance. The present study aimed to elucidate the merits and drawbacks associated with the utilization of drains in thyroidectomy procedures. **Methods:** A prospective clinical study was conducted at Sher-i-Kashmir Institute of Medical Sciences, Srinagar, investigating elective thyroidectomy patients. A total of 90 participants meeting the inclusion criteria of the study were randomly assigned to Group 1 (without drain) or Group 2 (with drain). **Results:** In Group 1, postoperative pain scores at 6 hours, 24 hours, and 48 hours were significantly lower than in Group 2 ($p < 0.001^*$). The requirement for analgesics and postoperative hospital stay was significantly higher in Group 2 ($p < 0.001^*$). The volume of fluid collected in the thyroid bed was higher in Group 1. Both groups had comparable rates of postoperative complications; however, Group 1 had higher patient satisfaction scores. **Conclusion:** Our study suggests that avoiding the use of a drain after thyroid surgery may lead to improved pain control, shorter hospital stays, and higher patient satisfaction. These findings provide valuable insights for surgeons and healthcare professionals when considering drain usage in thyroid surgery, although further research is warranted to validate and expand these results.

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Introduction

Thyroid surgery, specifically thyroidectomy, is a common procedure performed to treat various thyroid conditions, including thyroid cancer, goiter, and thyroid nodules. One aspect that surgeons often consider is whether to place a drain after the surgery or not. The decision to drain or not to drain post thyroidectomy is a topic of debate among surgeons, with differing opinions on its necessity and associated complications. The primary purpose of a surgical drain is to remove excess fluid or blood that may accumulate in the surgical area. By doing so, it helps reduce the risk of complications such as hematoma formation, infection, and seroma.[1] However, the necessity and effectiveness of drains in thyroid surgery have been questioned in recent years.[2-5] Some surgeons argue that routine drain placement may not be required in all cases and could potentially lead to increased discomfort, prolonged hospital stay, and higher healthcare costs.[3-5]

Proponents of drain usage after thyroid surgery emphasize its potential benefits, particularly in cases where there is a higher risk of bleeding or in extensive surgeries involving removal of a large thyroid mass.[6-8] Drains are believed to aid in the early detection of bleeding and provide a means for prompt intervention. Moreover, they may help alleviate swelling and discomfort by reducing the accumulation of fluid in the surgical site.[6,7] On the other hand, opponents of drain placement argue that the risks associated with drains, such as infection and damage to surrounding structures, outweigh their benefits in most cases of thyroid surgery.[9-11] They suggest that meticulous surgical techniques and the application of advanced hemostatic agents during the procedure can significantly minimize the risk of postoperative complications, rendering drains unnecessary.

This paper aims to explore the necessity of drains, potential complications, and possible interventions in patients with drains and without drains after thyroid surgery, considering various factors such as operating time, fluid collection, pain management, infections, hospital stay, bleeding, thyroid volume, patient satisfaction, and postoperative complications such as hypoparathyroidism and recurrent laryngeal nerve palsy. By examining the pros and cons of drain placement, we hope to shed light on this controversial topic and provide insights to help healthcare professionals make informed decisions based on the best available evidence and their clinical judgment. Ultimately, the goal is to optimize patient outcomes and improve the overall quality of care in thyroid surgery.

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Materials and Methods:

A prospective clinical study was conducted at the Postgraduate Department of General and Minimal Invasive Surgery and Division of Endocrinology, Sher-i-Kashmir Institute of Medical Sciences, Srinagar, following ethical approval and obtaining informed consent from the participants. The study focused on patients undergoing elective thyroidectomy, including total thyroidectomy, sub-total thyroidectomy, near-total thyroidectomy, hemi thyroidectomy and isthmectomy.

The enrolled individuals were randomly divided into two groups: Group 1 consisted of patients without a drain, while Group 2 included patients with a drain. The primary endpoint of the study was to compare the volume of fluid collected in the drain and the thyroid bed between the two groups. Secondary endpoints evaluated in the comparative groups encompassed various aspects, such as post-operative pain (assessed using the Visual Analog Scale and analgesic requirement within 24 hours), length of hospital stay, incidence of infections, need for re-operations, seroma and hematoma formations, wound infections, operating time, occurrence of transient and permanent recurrent laryngeal nerve (RLN) palsy, transient and permanent hypocalcemia, and the correlation between preoperative thyroid volume and fluid collected in the drain and thyroid bed.

Patients presenting with goiter at the surgical outpatient department were interviewed and assessed for eligibility. Screening was performed to determine the suitability of potential study patients for surgery. A structured proforma was used to record all relevant details, including informed consent, preliminary data (such as name, age, registration number, contact details, presenting complaints, past history, family history, personal history, general, systemic, and local examination), and investigations. The proforma contained comprehensive information regarding the preoperative, intraoperative, and postoperative periods.

Inclusion criteria encompassed adult patients aged between 18 and 79 years with a diagnosis of goiter who agreed to participate in the study. Exclusion criteria comprised patients with bleeding tendencies, recurrent goiter, thyroid cancers with thyroid gland fixation to surrounding structures, uncontrolled comorbidities (such as uncontrolled diabetes mellitus and hypertension), completion thyroidectomy, large vascular goiter, patients with cervical lymph node metastasis requiring neck dissection, and sub-sternal goiter.

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Preoperative Evaluation:

After obtaining informed consent, all patients underwent a comprehensive preoperative assessment, including a detailed medical history, thorough physical examination, fibro-optic laryngoscopy to assess vocal cord mobility, and laboratory investigations such as complete blood count (CBC), kidney function tests (KFT), liver function tests (LFT), thyroid function tests (TFT), coagulogram, blood sugar levels, and thyroid autoantibodies (in selected patients). Imaging studies, including neck and chest x-rays, neck ultrasound (USG), electrocardiography (ECG), fine-needle aspiration cytology (FNAC), and computed tomography/magnetic resonance imaging (CT/MRI) if necessary, were also performed.

Intraoperative Assessment:

The intraoperative assessment depended on the specific thyroid disorder being treated, such as total thyroidectomy, hemi thyroidectomy, sub-total thyroidectomy, or isthmectomy. The duration of the operation was defined as the time from the first incision to the placement of the final suture. Wound closure was performed using subcutaneous 4/0 absorbable sutures. In patients from the study group, a closed suction drain with negative pressure (romovac) was inserted through a separate wound. Blood loss during surgery was calculated.

Ultrasound Assessment:

Ultrasound assessment was conducted to evaluate the fluid collected in the operative bed in both the control and study groups. Using B-Mode ultrasound with a linear frequency of 7.5 MHz, a radiologist performed ultrasound examinations of the neck in both groups at 24-48 hours after surgery. The volume of fluid collected in the operative bed was calculated by measuring the maximum diameter in three dimensions, and the fluid collected in the drain was measured separately. The drain was removed from all patients between 24 to 48 hours. A correlation analysis was conducted to determine the relationship between the preoperative thyroid volume and the fluid collected in the thyroid bed and drain.

Postoperative Pain Assessment:

Postoperative pain was evaluated using the visual analog scale (VAS), which ranged from 0 (no pain) to 10 (worst pain). The VAS score was recorded at the postoperative 6th hour and on the

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1st, 2nd, and 3rd day, if the patient had not been discharged. A standard analgesia protocol was followed based on the VAS score. Ketorolac tromethamine was administered intramuscularly when the pain score was 5 or higher, along with intravenous paracetamol 1 mg twice daily. The amount of analgesia administered was adjusted according to the patient's requirements, and the total amount given was documented for each patient.

Wound Infection Grading:

Wound infections were classified according to the following categories:

Grade 1: Presence of erythema, induration, and pain.

Grade II: Same as Grade I, but with seroma.

Grade III: Presence of contaminated fluid in less than half of the wound.

Grade IV: Same as Grade III, but contaminated fluid in more than half of the wound.

Seroma and Hematoma Assessment:

The development of seroma and hematoma was clinically assessed by palpation at 24-48 hours and two weeks postoperatively. Clinical seroma and hematoma were defined as the presence of localized fluctuant swelling at the wound site. Ultrasound examination of the neck was performed for all patients to estimate the amount of fluid in the surgical bed. Subcutaneous collection was defined as the presence of ultrasound-detected fluid beneath the skin flap and superficial to the strap muscles. A deep collection was defined as the presence of ultrasound-detected fluid collection at the thyroid bed, deep to the strap muscles.

Postoperative Transient and Permanent Hypocalcemia:

Postoperative transient and permanent hypocalcemia were assessed by measuring serum calcium levels. Biochemical hypoparathyroidism was defined as a serum calcium level below 8.1 mg/dl, with the reference range being 8.1 mg/dl to 10.4 mg/dl.

Postoperative Transient or Permanent Recurrent Laryngeal Nerve (RLN) Injury:

RLN injury was evaluated both clinically and through pre- and post-operative indirect laryngoscopy. Any signs of vocal cord dysfunction or paralysis were carefully assessed.

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Wound Dehiscence:

Wound dehiscence was considered present when surgical closure of the cutaneous, subcutaneous (superficial), or facial or muscular (deep) layers was necessary in the early postoperative period. The integrity of the wound was closely monitored for any signs of separation or breakdown.

Patient Satisfaction:

One week after the operation, patients were asked to rate their overall level of satisfaction. The ratings were categorized as follows: 1 - Bad, 2 - Moderate, 3 - Good, 4 - Excellent.

Statistical Methods:

The collected data was compiled and entered into a spreadsheet using Microsoft Excel. Subsequently, the data was exported to the data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA) for statistical analysis. Continuous variables were expressed as mean ± standard deviation, while categorical variables were summarized as frequencies and percentages. Graphical representations of the data were created using bar and pie diagrams. Statistical tests, such as Student's independent t-test or Mann-Whitney U-test for continuous variables, and the chi-square test or Fisher's exact test for categorical variables, were utilized for comparisons. A p-value less than 0.05 was considered statistically significant.

Results

We observe that in Group 1, the majority of patients were in the age range of 30-39 years (37.8%), while in Group 2, the highest percentage was in the 30-39 age group (42.2%). The mean ages in Group 1 and Group 2 were 42.7 and 40.3 years, respectively. however, there was no statistically significant difference in age distribution between the two groups (p=0.122). There was a predominance of female patients in both the groups; in Group 1, there were 45 patients, with 5 patients being male (11.1%) and 40 patients being female (88.9%). In Group 2, there were also 45 patients, with 6 patients being male (13.3%) and 39 patients being female (86.7%). However; with a p-value of 0.612, the difference between the groups was insignificant. When the distribution of surgical types in Group 1 and Group 2 was assessed, we found that majority of patients in both groups underwent total thyroidectomy. Albeit, there was no statistically significant difference in the distribution of surgical types between the two groups (p=0.716). In Group 1, out of 45 patients, the

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most common nature of lesion was papillary carcinoma (44.4%), followed by follicular adenoma (24.4%), colloid goitre (15.6%), toxic goitre (11.1%), and Hurtle cell carcinoma (4.4%). In Group 2, out of 45 patients, the distribution of lesion nature was similar, with papillary carcinoma being the most common (40.0%), followed by follicular adenoma (26.7%), colloid goitre (20.0%), toxic goitre (8.9%), and Hurtle cell carcinoma (4.4%). No statistically significant difference in the nature of lesions between Group 1 and Group 2 was observed. In Group 1, 11.1% of patients were toxic, while in Group 2, 8.9% were toxic. The majority of patients in both groups had a non-toxic character. There was no statistically significant difference in the distribution between the two groups (p=0.725).When the comparison based on thyroid volume (ml) in two groups was performed, we found that in Group 1, the mean thyroid volume was 52.91 ml (SD=12.79), while in Group 2, it was 54.25 ml (SD=15.81). There was no statistically significant difference in thyroid volume between the two groups (p=0.659).

Table 1: Postoperative 6-hour pain score (VAS) in two groups				
Group	**Mean**	**SD**	**95% CI**	**P-value**
Group 1	3.43	1.73	2.51-2.94	<0.001*
Group 2	4.89	2.14	3.47-5.75	

*Statistically Significant Difference (P-value<0.05); CI: Confidence Interval

Table 1 presents the comparison of postoperative 6-hour pain scores (measured using the Visual Analog Scale - VAS) between Group 1 and Group 2. In Group 1, the mean pain score at 6 hours postoperative was 3.43 (SD=1.73), with a 95% CI ranging from 2.51 to 2.94. In Group 2, the mean pain score at 6 hours postoperative was 4.89 (SD=2.14), with a 95% CI ranging from 3.47 to 5.75. The p-value calculated for the comparison of pain scores between the two groups was found to be less than 0.001, indicating a statistically significant difference. Group 1 had a significantly lower pain score compared to Group 2 at the 6-hour postoperative time point. Overall, these findings suggest that patients in Group 1 experienced less pain at 6 hours postoperatively compared to those in Group 2, based on the VAS pain scores.

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Table 2: Postoperative 24-hour pain score (VAS) in two groups				
Group	**Mean**	**SD**	**95% CI**	**P-value**
Group 1	1.97	1.42	1.42-2.58	<0.001*
Group 2	3.15	1.89	2.71-3.94	

*Statistically Significant Difference (P-value<0.05); CI: Confidence Interval

When the pain score was evaluated 24 hours postoperatively, we found that the mean pain score at 24 hours postoperative in group 1 was 1.97 (SD=1.42), while as in Group 2, the mean pain score at 24 hours postoperatively was 3.15 (SD=1.89), The p-value calculated for the comparison of pain scores between the two groups was found to be less than 0.001, indicating a statistically significant difference. Group 1 had a significantly lower pain score compared to Group 2 at the 24-hour postoperative time point. These findings suggest that patients in Group 1 experienced less pain at 24 hours postoperatively compared to those in Group 2, based on the VAS pain scores.

Table 3: Postoperative 48-hour pain score (VAS) in two groups				
Group	**Mean**	**SD**	**95% CI**	**P-value**
Group 1	1.34	0.97	1.07-1.82	<0.001*
Group 2	2.19	1.15	1.73-2.62	

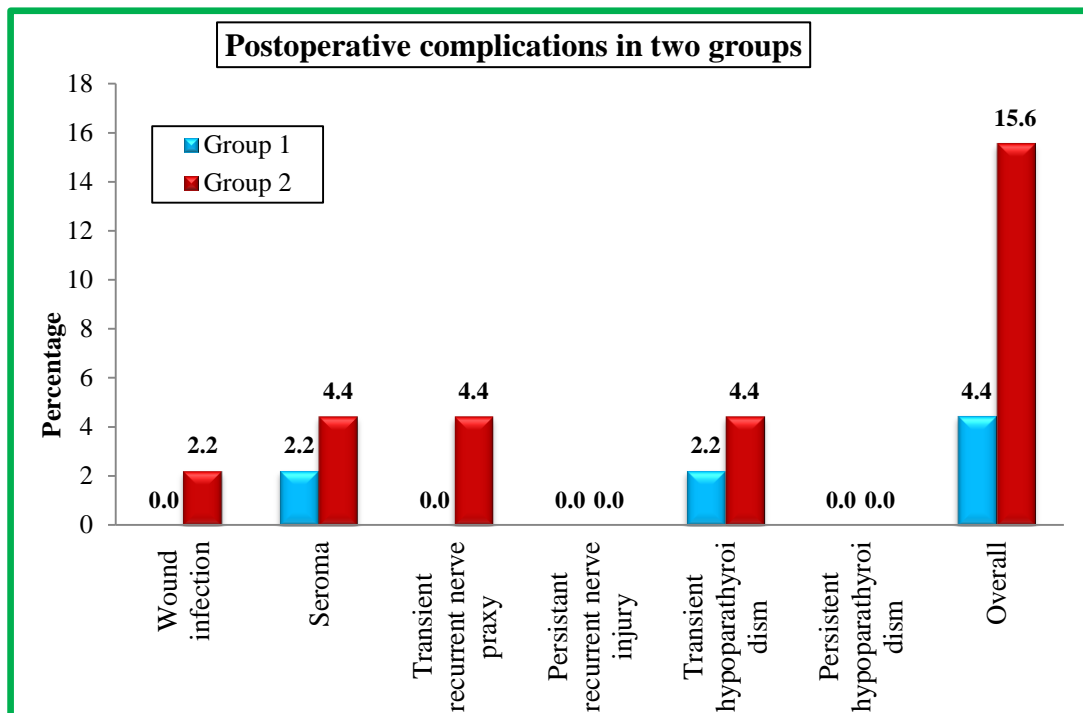***Statistically Significant Difference (P-value<0.05); CI: Confidence Interval**

Table 3 compares the postoperative 48-hour pain scores (measured using the Visual Analog Scale - VAS) between Group 1 and Group 2. In Group 1, the mean pain score at 48 hours postoperative was 1.34 (SD=0.97), while as in Group 2, the mean pain score at 48 hours postoperative was 2.19 (SD=1.15).The calculated p-value for the comparison of pain scores between the two groups was found to be less than 0.001, indicating a statistically significant difference. Group 1 had significantly lower pain scores compared to Group 2 at the 48-hour postoperative time point. These results suggest

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that patients in Group 1 experienced less pain at 48 hours postoperatively compared to those in Group 2, based on the VAS pain scores.In the present study we found that Group 1 required significantly fewer doses of Ketorolac compared to Group 2. These findings suggest that patients in Group 1 had a lower overall requirement for Ketorolac doses compared to those in Group 2.

Table 4: Postoperative hospital stay (Days) in two groups					
Group	**N**	**Mean**	**SD**	**95% CI**	**P-value**
Group 1	45	1.32	0.473	1-3 Days	<0.001*
Group 2	45	2.51	0.794	1-5 Days	

***Statistically Significant Difference (P-value<0.05); CI: Confidence Interval**

Table 4 compares the postoperative hospital stay in days between Group 1 and Group 2. Group 1 had a mean stay of 1.32 days (SD = 0.473), while Group 2 had a mean stay of 2.51 days (SD = 0.794). The p-value was <0.001, indicating a significant difference. Group 1 had a shorter hospital stay compared to Group 2 (1-3 days vs. 1-5 days). When the volume of fluid collection (ml) in thyroid bed assessed by USG in two groups, we found that in Group 1, the mean volume of fluid collection was 16.3 ml with a standard deviation of 8.54 ml and a range of 10-30 ml. In Group 2, the mean volume of fluid collection was 12.4 ml with a standard deviation of 7.43 ml and a range of 5-20 ml. The p-value of 0.073 suggests a borderline statistically significant difference in the volume of fluid collection between the two groups.When the complication among the patients of two groups was assessed, we found that in Group 1, there were no cases of wound infection, transient recurrent nerve praxy, persistent recurrent nerve injury, or persistent hypoparathyroidism. There was one case of seroma and one case of transient hypoparathyroidism (both 2.2%).

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In Group 2, one case of wound infection (2.2%), two cases of seroma (4.4%), two cases of transient recurrent nerve praxy (4.4%), and two cases of transient hypoparathyroidism (4.4%) were observed. The p-values indicate that there was no statistically significant difference in the occurrence of complications between the two groups, except for wound infection (p=1.000). Overall, Group 2 had a slightly higher percentage of complications (15.6%) compared to Group 1 (4.4%), but the difference was not statistically significant (p=0.159).

Table 5: Postoperative dysnea and cough in two groups					
Dysnea and cough	Group 1		Group 2		P-value
	No.	%age	No.	%age	
Present	3	6.7	11	24.4	
Absent	42	93.3	34	75.6	0.042*
Total	45	100	45	100	

*Statistically Significant Difference (P-value<0.05)

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Table 5 presents the incidence of postoperative dyspnea and cough in Group 1 and Group 2. In Group 1, 6.7% of patients experienced dyspnea and cough, while in Group 2, 24.4% of patients had these symptoms. The p-value of 0.042* indicates a statistically significant difference between the two groups, with a higher percentage of patients in Group 2 experiencing dyspnea and cough compared to Group 1.

Table 6: Patient satisfaction in two groups					
Patient Satisfaction	**Group 1**		**Group 2**		**P-value**
	No.	**%age**	**No.**	**%age**	
Excellent	23	51.1	15	33.3	0.036*
Good	18	40.0	17	37.8	
Moderate	4	8.9	7	15.6	
Bad	0	0.0	6	13.3	
Total	45	100	45	100	

Table 6 presents the patient satisfaction levels in Group 1 and Group 2. In Group 1, 51.1% of patients rated their satisfaction as "Excellent," 40.0% as "Good," 8.9% as "Moderate," and none as "Bad." In Group 2, 33.3% of patients rated their satisfaction as "Excellent," 37.8% as "Good," 15.6% as "Moderate," and 13.3% as "Bad." The p-value of 0.036* indicates a statistically significant difference in patient satisfaction between the two groups, with a higher percentage of patients in Group 1 reporting "Excellent" satisfaction compared to Group 2.

Discussion

The use of drains after thyroid surgery remains a topic of controversy and debate among surgeons worldwide. In this study, we aimed to contribute to the existing body of knowledge by conducting a prospective comparative study to evaluate the necessity and effectiveness of drains in post-thyroidectomy patients at our Institute. Ninety patients were enrolled in this randomized controlled trial, equally allocated into two groups: Group 1 without post-procedure drainage and Group 2 with drainage following total thyroidectomy. The mean age of patients in Group 1 was (42.7±7.81) years, while in Group 2 it was (40.3±6.73) years, showing no statistically significant difference (p=0.122).

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These findings align with previous studies by Kalemera et al. and Colak et al., where comparable age distributions were observed between drained and non-drained groups.[1,12] Similarly, there was a predominance of female patients in both groups (88.9% vs 86.7%), but the difference between the groups was not statistically significant (p=0.612). This higher proportion of females in the study is consistent with findings from Tahsin et al. and Davari et al., where the majority of participants were also female (79.3% and 78.8% respectively), reflecting a similar pattern to our study.[2,3] Despite the well-established association between the type of thyroid surgery and the placement of drains, we conducted a statistical analysis to ensure comparability between the two groups in terms of surgical procedures. Our findings indicated that total thyroidectomy was performed in 73.3% of patients in Group 1 and 80% in Group 2, while hemi thyroidectomy was performed in 22.2% of Group 1 patients and 17.8% of Group 2 patients. Both groups had an equal proportion of patients (2.2%) undergoing hemi thyroidectomy with isthmusectomy, whereas subtotal thyroidectomy was performed in 2.2% of Group 1 patients but not in Group 2. The p-value of 0.716 suggested no significant difference in the type of surgery between the two groups. Regarding the pathology, malignant cases accounted for 71.1% in Group 1 and 64.4% in Group 2, whereas benign pathology was observed in 28.9% of Group 1 patients and 35.6% of Group 2 patients. However, the p-value of 0.498 indicated no significant difference between the groups in terms of pathology distribution. Notably, some patients with large benign nodules involving the entire thyroid gland underwent total thyroidectomy, which aligns with the approach taken in malignant cases. A study by Emmi et al. reported similar findings, where the comparison of operations performed in the drain and no drain groups was statistically significant (p=0.5), consistent with our study.[13]

Furthermore, the groups were stratified based on toxic and non-toxic subgroups, revealing no significant difference in the volume of fluid collection (p=0.725). The non-toxic character was observed in 88.9% of patients in Group 1 and 91.1% of patients in Group 2. The incidence of toxic character in Group 1 was observed in 11.1% of patients, while Group 2 exhibited 8.9%. However, the p-value of 0.725 indicated that the difference between the two groups was statistically insignificant. It is noteworthy that both groups were allocated an equal number of patients through randomization. This randomization process successfully ensured a balanced distribution of age, gender, types of thyroid surgeries performed (total thyroidectomies and hemi thyroidectomies), and histopathological findings, thereby minimizing potential biases that could have skewed the results in favor of one group over the other. The study assessed the impact of drain insertion on various outcomes, including pain

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levels, analgesic requirements, duration of hospital stay, and other relevant factors. Notably, the study found comparable thyroidal volume and dead space between the two groups (52.91 ml in Group 1 vs. 54.25 ml in Group 2, p=0.659). These findings align with a study conducted by Devici et al., which reported similar results, where the mean thyroid volume was 54.31 mL (range 17.3–116.4 mL) in Group 1 and 53.72 mL (range 16.8–120.4 mL) in Group 2. The consistency between our study and Devici et al.'s study further supports the comparable differences observed between the groups.[14]

In our study, we observed a significant difference in the postoperative 6-hour pain score between the two groups. Group 1, which did not receive drains, had a mean pain score of 3.43, whereas Group 2, which had drains inserted, had a mean pain score of 4.89 (p-value <0.0001). Pain assessment was conducted using a visual analogue scale (VAS) ranging from 0 (no pain) to 10 (worst pain imaginable) at the 6th postoperative hour and the first postoperative day. Our findings are consistent with a study conducted by Deveci et al., where they reported significantly lower mean VAS scores in the non-drain group compared to the drain group at 3.64 versus 4.95, which aligns with our results.[14] Furthermore, at 24 and 48 hours after surgery, the mean VAS scores in Group 1 remained significantly lower than those in Group 2 (1.97 vs. 3.15, p-value <0.001, and 1.34 vs. 2.19, p-value <0.001*, respectively). Several previous studies have investigated the relationship between drain insertion and postoperative pain. Schoretsanitis et al. found a similar approximately 50% reduction in VAS scores in the non-drained group, aligning with our observations.[15] Colak et al. also noted a significant decrease in postoperative pain among non-drained patients, particularly on postoperative days 1.[12] Additionally, Schietroma et al. reported significantly lower postoperative VAS scores in the drained group, which corresponds with our study.[16]

Postoperative pain is associated with patient discomfort and can contribute to prolonged hospital stays independent of complications. In our study, the requirement for analgesics, specifically ketorolac, was significantly higher in Group 2 compared to Group 1. Group 2 had a higher requirement for 3 doses (42.2% vs. 15.6%), while Group 1 had a higher requirement for 2 doses (51.1% vs. 40%) and 1 dose (33.3% vs. 11.1%). Furthermore, 6.7% of patients in Group 2 required 4 doses of ketorolac compared to none in Group 1. Colak et al. also found that the non-drained group had a significantly lower requirement for analgesics compared to the drained group, with a higher proportion of non-drained patients not needing intramuscular analgesics.[12]

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In our study, we observed a significantly longer postoperative hospital stay in Group 2 compared to Group 1 (2.51 vs. 1.32 days, p-value <0.001*). This finding is consistent with other studies conducted by Schoretsanitis et al., Khannaj et al., and Muthaa et al.[15,17,18]For instance; Mutaha et al. reported a mean hospital stay of 2.2 days for all 90 patients in their study.[18] The results of our study revealed that patients in the non-drained group had a significantly shorter length of hospital stay compared to those in the drained group (p = 0.001). On average, patients in the non-drained group stayed in the hospital for 1.2 days (SD 0.06), while those in the drained group stayed for 3.2 days (SD 0.12). These findings are consistent with previous research, such as the study by Suslu et al., which demonstrated that the insertion of drains prolonged hospital stay compared to the non-drained group (p=0.001).[19] Similarly, Morrissey et al. found that thyroid surgery without the use of drains reduced hospital stay without increasing patient morbidity.[20]

The presence of drains can potentially lead to tissue reactions and increased fluid collection. Negative suction from drains may interfere with the sealing off of lymphatics, resulting in increased seroma formation and drainage. In our study, we estimated thyroid gland volumes based on ultrasound readings and calculated the volume of fluid collection in the operative bed, as well as the fluid collected in the drain. We observed that the volume of fluid collected from the thyroid bed in the non-drained group was comparable to that in the drained group. This finding aligns with the study by Deveci et al., which reported similar amounts of fluid collection in the thyroid bed between the two groups.[14] The primary goals of using drains have historically been to prevent postoperative complications, such as lymphatic or hematoma accumulation, and to alert the surgeon to early postoperative bleeding. However, in our study, the incidence of postoperative complications, including wound infection, seroma, and transient hypoparathyroidism, did not show significant differences between the non-drained and drained groups. These findings are consistent with previous studies conducted by Khanna et al. and Schoretsanitis et al.[15,17] Furthermore, our study revealed that one patient in the drained group developed wound infection, supporting the notion that drains may increase the risk of infectious complications, as previously reported in the literature. Colak et al. also found comparable rates of seroma and hematoma complications between the groups in their study.[12]

In the present study, the prevalence of dyspnea and cough was significantly higher in group 2 (24.4%) compared to group 1 (6.7%). While functional factors such as itching sensation and pain are typically not directly assessed, our study incorporated these factors through a patient scale, allowing us to evaluate their impact on satisfaction levels. A satisfaction survey was conducted among patients

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from both groups, revealing noteworthy differences. Group 1 exhibited significantly higher satisfaction scores, with 51.1% of patients reporting an excellent score compared to 33.3% in group 2. Additionally, 40% of patients in group 1 expressed a good score compared to 37.8% in group 2. The moderate score was observed in 15.6% of patients in group 2, while only 8.9% of patients in group 1 reported the same. Furthermore, a bad score was reported by 13.3% of patients in group 2, while none were observed in group 1. To the best of our knowledge, limited research exists on measuring patient satisfaction specifically related to the use of drains or non-drains post thyroidectomy. However, a study by Kim et al. explored patient satisfaction seven months postoperatively, focusing on aesthetic and functional outcomes using the patient and observer scar assessment scale.[21] Their findings align with our study, as they concluded that avoiding the use of drains after thyroidectomy contributes to higher patient satisfaction and reduces the likelihood of severe scar formation.

Conclusion

In our study, we conducted a comprehensive analysis of two groups of patients undergoing thyroid surgery to evaluate the impact of using a drain versus not using a drain. The groups were well-matched in terms of age, gender, type of surgery, proportion of benign and malignant cases, toxic and non-toxic character, and thyroid volume, ensuring that any observed differences were not influenced by these factors. One significant finding was that patients in the group without a drain (group 1) experienced significantly lower postoperative pain scores compared to the group with a drain (group 2) at 6 hours, 24 hours, and 48 hours after surgery. This suggests that the omission of a drain may contribute to reduced pain and discomfort during the early recovery period. Our study suggests that avoiding the use of a drain after thyroid surgery may lead to improved pain control, shorter hospital stays, and higher patient satisfaction. These findings provide valuable insights for surgeons and healthcare professionals when considering drain usage in thyroid surgery, although further research is warranted to validate and expand upon these results.

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