

Post-thyroidectomy Drain Placement Prolongs Hospital Stay: A Retrospective Study from Jazan, Saudi Arabia

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Original Article

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ABSTRACT

Objective: This study aims to compare post-operative outcomes between drain and no-drain approaches following thyroidectomy for goiter in Jazan, Saudi Arabia.

Study Design: Retrospective analysis

Settings: King Fahd Central Hospital and Prince Mohammed bin Nasser Hospital, Jazan Region, Saudi Arabia

Subjects and Methods: We included adult patients (18–79 years) diagnosed with goiter who underwent thyroidectomy between January 2018 and January 2020. Patients were categorized into two groups based on drain placement (drain vs. no drain). We conducted univariate and bivariate analyses to assess the relationship between drain placement and hospital stay, along with other factors

Results: No significant differences were observed in surgical complications or procedure type between the drained and non-drained groups. However, patients with drains experienced significantly longer hospital stays ($p = 0.00$).

Conclusion: Routine drain placement after thyroidectomy may be unnecessary and could prolong hospitalization without demonstrably improving patient outcomes. Further research is crucial to establish clear guidelines on drain usage in thyroidectomy.

Key Words: Drain, goite, thyroid.

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INTRODUCTION

Thyroidectomy is a common surgical procedure with diverse approaches and postoperative management strategies. One particularly debated aspect is the use of postoperative drains. Historically, drains were employed to prevent hematoma and seroma formation, potentially reducing reoperation rates for hemorrhage. However, recent literature suggests a shift towards minimizing or omitting drains entirely due to associated disadvantages, including increased pain, longer hospital stays, and no significant reduction in bleeding-related reoperation rates^[1]. Proponents of drain use argue that they evacuate blood and serous fluids, preventing postoperative hematoma

formation^[2]. However, several studies have demonstrated the safety of drainless thyroidectomy^[3]. Conversely, other studies highlight the potential benefits of drains in reducing surgical bed collection risk. However, the evidence supporting their routine use is limited, as no advantage has been demonstrably linked to their systematic application in uncomplicated thyroid surgery, except in patients with coagulopathy, intrathoracic goiters, or those undergoing concurrent extensive neck dissection^[2].

Despite conflicting findings, indicating a lack of consensus on the necessity and efficacy of post-thyroidectomy drains, critical evaluation of existing literature is crucial to determining the most appropriate

drainage approach in thyroid surgery. Further research is needed to assess the utility and safety of drains and alternative hemostatic techniques. This study aims to evaluate our experience with drain versus no-drain approaches following thyroidectomy for goiter in Jazan, Saudi Arabia.

SUBJECTS AND METHODS

This study employed a retrospective analysis of prospectively collected data from a hospital database at King Fahd Central Hospital (KFCH) and Prince Mohammed bin Nasser Hospital (PMBNH) in Jazan City, Saudi Arabia. The study focused on adult patients diagnosed with goiter who underwent thyroidectomy between January 2018 and January 2020. The inclusion criteria for the study comprised patients aged 18–79 years with a confirmed goiter diagnosis. Patients with a history suggestive of bleeding tendencies, recurrent goiter, thyroid cancer with fixation to surrounding structures, or uncontrolled co-morbidities like diabetes mellitus and hypertension were excluded. Three experienced thyroid and endocrine surgeons performed the surgeries, and standardized data collection tools were used to capture relevant information on each patient from recruitment to discharge. These tools were securely stored under the supervision of the principal investigator. A standard discharge protocol was followed for all patients. The study aimed to investigate the use of drains, length of hospital stay, pain levels, wound sepsis, and other potential complications. Following data collection, the information was cleaned, coded, and double-entered using Epidata v3.1 software. Subsequently, the data was exported to STATA v10.0 for statistical analysis.

Univariate analysis was conducted to summarize continuous data (age, hospital stay) using means and standard deviations, or medians and interquartile ranges. Categorical data analysis employed Chi-square or Fisher's exact tests as appropriate. Additionally, Student's t-tests were used to assess significant differences in normally distributed continuous data. Bivariate analysis was performed to evaluate the relationships between variables, with results reported as risk ratios. Furthermore, a Cox proportional hazards model was employed to specifically assess the impact of drain placement on the duration of the hospital stay. Ethical approval for the study was obtained from the Ethics and Research Committees of the Faculty of Medicine, Jazan University.

RESULTS

This study included 107 patients who underwent thyroid surgery, of which 18.7% were male and 81.3% were female. The most common diagnosis was multinodular goiter (81.3%), followed by papillary thyroid carcinoma (14%), Graves' disease (3.7%), and follicular neoplasm (0.9%). Approximately half of the patients had a drain placed during surgery (50.5%), while the other half did not

(49.5%). Energy devices (Harmonic scalpel or Ligasure) were used in all surgical procedures. 53.3% of patients were discharged within 24 hours (Table 1). Of the 107 patients, 70 (65.4%) underwent total thyroidectomy, 32 (29.9%) had hemithyroidectomy, and 5 (4.7%) underwent completion thyroidectomy.

Table 1: Descriptive characteristics of the variables

Variables	Drain	No drain	Frequency n (%)
Gender			
Male	7	13	20 (18.7%)
Female	47	40	87 (81.3%)
Diagnosis			
MNG	46	41	87(81.3%)
PTC	8	7	15(14.0%)
Graves' disease	0	4	4(3.7%)
Follicular neoplasm	0	1	1(0.9%)
Procedure			
Total thyroidectomy	35	35	70(65.4%)
Hemi thyroidectomy	19	13	32(29.9%)
Completion thyroidectomy	0	5	5(4.7%)

n - total sample size (n=107), MNG= multi-nodular goiter, PTC=Papillary thyroid cancer

Statistical analysis found no significant association between the type of procedure (total thyroidectomy, hemithyroidectomy, or completion thyroidectomy) and hospital length of stay ($p > 0.05$). Additionally, there was no significant relationship between procedure type and postoperative complications ($p = 0.89$). The presence of a surgical drain was also not associated with increased complications ($p = 0.35$). However, hospital stay was strongly correlated with drain placement ($p = 0.00$), with drained patients having longer durations of stay (Table 2).

Table 2: Relation between presence of drain, complications and length of stay

Complication	With Drain	Without Drain	
No complication	54	51	
RLNP	0	1	0.35 (NS)
Hypocalcemia	0	1	
Hospital duration			
24 hours	7	50	
48 hours	47	2	0.00 (S)
72 hours	0	1	

*Chi square analysis was conducted considering *P-Value* less than 0.05 as significant

NS: Not significant; S: Statistically Significant, RLNP: recurrent laryngeal nerve palsy

DISCUSSION

Our findings suggest that drain placement might be unnecessary for many patients undergoing thyroid surgery, potentially reducing postoperative burdens. Meticulous hemostasis and the surgeon's experience are likely more critical factors than routine drain placement in most cases. However, the debate surrounding drain usage in this context continues, with conflicting evidence regarding its efficacy and necessity. A comprehensive literature review revealed a lack of consensus on this topic, highlighting the need for further investigation and standardized drain use protocols in thyroidectomy.

The core debate revolves around whether drains mitigate postoperative complications like hematoma or seroma and influence hospital stay duration, patient discomfort, and cosmetic outcomes. Traditionally, drains were employed to prevent hematoma formation, a potential risk factor for urgent reoperation due to airway compromise. However, recent studies suggest that routine drain placement may not offer significant benefits, potentially leading to longer hospital stays and even increased complications^[1]. Maroun *et al.* conducted a large-scale retrospective analysis involving over 11,000 patients, finding no significant difference in hematoma formation between drained and non-drained groups^[4]. Similar to our findings, drain use was associated with extended hospital stays. Chen *et al.* observed no increase in postoperative complications in their no-drain group undergoing endoscopic thyroidectomy, with additional benefits including shorter operation times, reduced hospital stays, and improved pain scores^[5]. Supporting this notion, Kalemera Ssenyondo *et al.*'s randomized controlled trial demonstrated that avoiding postoperative drains correlated with shorter hospital stays and less pain^[6]. Additionally, George *et al.*'s prospective study found a significantly lower hospital stay and postoperative pain for patients without drains, in addition to improved cosmetic outcomes and overall patients' satisfaction^[7]. Furthermore, a single-surgeon report on redo thyroid surgeries without drains revealed no significant difference in hematoma formation across groups undergoing primary bilateral thyroidectomy, completion thyroidectomy, or surgery for recurrent diseases, suggesting that avoiding routine drains does not increase surgical morbidity while potentially reducing hospital stays^[3]. This aligns with other studies emphasizing enhanced patient comfort and reduced infection rates without compromising safety^[8]. Kennedy *et al.*'s meta-analysis did not identify a statistically significant benefit or harm associated with drain use, further highlighting the lack of conclusive evidence supporting routine drainage^[9]. This aligns with Kalemera Ssenyondo *et al.*'s findings and a systematic review by Portinari *et al.*, both reporting shorter hospital stays and less pain in the no-drain groups^[1, 6]. Furthermore, Portinari *et al.* found no difference in reoperation rates for bleeding between drained and non-drained groups^[1]. Additionally, another systematic review

identified no difference in reoperation rates for neck hematoma or ultrasound-assessed fluid volume post-surgery but found increased hospital stays and wound infection rates in the drained group^[8].

The utility of drains also appears to depend on the surgeon's specialty. Stopenski *et al.*'s analysis revealed that otolaryngologists employed drains more frequently than general surgeons, though this did not demonstrably affect outcomes when considering other variables^[10]. Similarly, Zhang *et al.*'s meta-analysis showed that drain placement did not decrease postoperative wound hematoma formation and significantly increased infection risk in drained patients, underscoring concerns about potential harms outweighing purported benefits^[11]. These findings highlight the importance of critically evaluating traditional surgical practices and considering their potential lack of benefit, potential cost increases, and discomfort.

Studies suggest that 80% of thyroid surgeries might not require postoperative drainage^[2]. Additionally, Hernández-Avendaño V and Jiménez-López M's study revealed minimal drain usage primarily in procedures involving larger lesions, emphasizing surgeon discretion based on meticulous intra-operative hemostasis over routine drain placement^[2]. However, the correlation between lesion size and drain use does not imply causation, as larger lesions might inherently be associated with more complex procedures and longer stays regardless of drainage. While drains might help identify active bleeding postoperatively, recognition of this complication often relies on clinical presentation, and drainage cannot prevent or treat hematoma formation^[2]. Moreover, drains may be ineffective in decompressing arterial hematomas and might be occluded by synthetic material or clots, necessitating immediate reintervention.

The choice of surgical techniques and devices may also influence drain necessity. In our study, energy devices were used in all cases, and hemostasis was meticulously ensured before wound closure. Several topical hemostatic agents have also been effectively utilized in thyroid surgery^[12]. Pino *et al.* demonstrated the safety and effectiveness of the Vivosat® system for hemostasis during thyroid surgery^[13]. Similarly, Ruggiero *et al.*'s study comparing the ultrasonic scalpel and Ligasure device found no significant differences in complications or drainage volume^[14]. Such findings suggest that specific systems or techniques offer advantages impacting drain usage^[12].

Given the conflicting evidence and the lack of consensus, the decision to use drains should be individualized based on the patient's specific circumstances and the surgeon's judgment, considering factors such as risk factors for complications, surgery complexity, surgeon experience, and the availability of alternative hemostatic techniques^[3]. Advancements in minimally invasive approaches like transoral robotic thyroidectomy offer potentially reduced

flap dissection, potentially negating some concerns addressed by drainage, although its widespread adoption is still evolving^[15]. Additionally, research on adjunctive measures like tranexamic acid use suggests alternative strategies for mitigating bleeding risks, potentially eliminating the need for routine drain placement in head and neck surgeries, including thyroidectomies^[16].

However, if drains are employed, proper management and monitoring are crucial to minimize complications. Optimal placement ensures effective drainage, and removal should occur as soon as drainage diminishes to an acceptable level. Close monitoring of drainage volume and characteristics is essential to detecting signs of complications like excessive bleeding or infection. While some argue for selective drain application in specific clinical scenarios, such as extensive dissections or operations involving substernal goiters, the weight of current evidence leans against routine drain usage, given associated drawbacks such as increased pain scores and longer hospital stays without clear benefits concerning major postoperative complications like hematoma formation.

Some limitations of this study include the retrospective design, the scarcity of complications in our cohort, and a relatively small sample size, which may limit the generalizability of our findings and comparisons between the two groups.

CONCLUSION

Our study contributes to the growing body of evidence suggesting that routine drain placement after thyroidectomy may not offer benefits in preventing hematomas but may instead prolong hospitalization and increase healthcare costs without significantly improving patient outcomes. Future research is crucial to establish clear guidelines regarding drain usage in thyroidectomy, considering patient-specific factors, surgeon expertise, and the evolving landscape of hemostatic techniques and minimally invasive approaches. This will ultimately optimize patient care by minimizing complications and maximizing postoperative recovery.

ABBREVIATIONS

- MNG= multi-nodular goiter.
- PTC= Papillary thyroid cancer.
- RLNP: recurrent laryngeal nerve palsy

CONFLICT OF INTERESTS

There are no conflicts of interest.

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