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ORIGINAL ARTICLE

Could post-thyroidectomy bleeding be the clue to modify the concept of postoperative drainage? A prospective randomized controlled study

Ali S. Al-Qahtani [a,b,*], Tarek Abouzeid Osman [c,d]

[a] Otorhinolaryngology-Head & Neck Surgery, College of Medicine, King Khalid University, Abha, Saudi Arabia
[b] Otorhinolaryngology-Head & Neck Surgery, Assir Central and Abha Private Hospital, Abha, Saudi Arabia
[c] General Surgery, College of Medicine, Ain-Shams University, Cairo, Egypt
[d] General Surgery, Abha Private Hospital, Abha, Saudi Arabia

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Summary *Background/Objective:* To unveil the real effect of surgical drains on the outcomes of thyroidectomy for benign thyroid disorders.
Methods: A prospective randomized study was conducted at Abha Private Hospital, Saudi Arabia on 108 patients suffered from benign thyroid disorders undergoing elective thyroidectomy from 1 August 2015 to 28 February 2017. Patients were allocated randomly into drainage group (A) and non-drainage group (B). The demographic data, operation (type and duration), postoperative complications, histopathological results and length of stay were assessed, documented and statistically verified to check its significance.
Results: A total of 108 patients were enrolled in the study; 94 females and 14 males with mean age of 38.02 years, two patients developed hematoma (1.85%); one in each group and another two patients had seroma with no significant difference between both groups, the mean length of stay was significantly higher in group (A) ($p = 0.001$).
Conclusion: This prospective study verified that routine drainage adds no significant advantage in the prevention of post-thyroidectomy bleeding, but it prolongs hospitalization. This aids in changing the concept from the "wide" use of drains into the "wise" use in selected patients with risk factors of bleeding.

* Corresponding author. Otorhinolaryngology-Head & Neck Surgery, College of Medicine, King Khalid University, PO Box 3877, Abha 61481, Saudi Arabia. Fax: +966 172200415.
E-mail address: alqahtani@kku.edu.sa (A.S. Al-Qahtani).

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1. Introduction

Thyroid gland is a highly-vascularized endocrine organ, any hematoma within the closed paratracheal space can occlude the venous and lymphatic drainage that consequently leads to laryngopharyngeal edema and airway obstruction,[1,2] therefore, post-thyroidectomy hematoma could be a life-threatening sequalae.

Post-thyroidectomy hematoma has been variably reported in literature (0.1–6.5) % with an average 1% in large endocrine centers,[2,3] it mostly occurs within 2–6 h postoperatively.[4,5] However, the onset may be delayed up to the 13th day.[3]

The possible causes include the slippage of an improperly applied ligature due to retching, vomiting, Valsalva maneuver, increased venous and/or arterial pressure. It was shown to be associated with anticoagulant medications and hematologic diseases.[2,6–8]

The bleeding source may be from the subcutaneous tissue, infrahyoid muscles, upper pole, residual thyroid tissue, internal jugular vein, or tissues adjacent to the recurrent laryngeal nerve. Sometimes the bleeding source is not evident during wound re-exploration.[7–9]

The key for successful management depends on early detection and immediate proper intervention before airway obstruction occur; early detection relies on high index of suspicion in the first golden post-operative hours. The presence of sweating, tachycardia, irritability and confusion reflects early hypoxia, whereas ecchymosis, neck swelling, choking sensation, dyspnea, difficult phonation and stridor constitute the late symptoms and signs.[9] The surgical drain is usually blocked with clotted blood, a common problem that turns the drain into a misleading tool. So, the clinical picture of the patient is much more sensitive and specific in the diagnosis of Postoperative hematoma than drain discharge.[10]

The scientific research investigating post-thyroidectomy drainage could be broadly classified into 3 groups: The first group of authors are convinced with the routine drainage; their research is designed to compare the negative suction drains and natural drains.[10,11] The second group are not convinced with drains, that's why their research is based on the "no-drain concept",[12,13] whereas the third group tried to compare the rates of bleeding with and without drains.[14–19]

Nevertheless, these controversial studies are still not convincing to many surgeons due to its retrospective design as well as the exclusion of both Graves' disease and the retrosternal goiters. This prospective randomized study was conducted to evaluate the role of drainage post-thyroidectomy for all benign thyroid disorders including Graves' disease and the retrosternal goiters.

2. Methods

Upon Approval of the Institutional Review Committee of the hospital, a prospective randomized study has been conducted at Abha Private Hospital, Kingdom of Saudi Arabia, on 108 patients suffered from benign thyroid diseases underwent thyroidectomy in a single unit from 1 August 2015 to 28 February 2017. Patients of either gender, aged 14–75 years who had benign thyroid disorders and are candidates for thyroidectomy were enrolled in this study, exclusion criteria included bleeding disorders, history of neck malignancy, previous neck surgery or radiotherapy, and those unfit for general anesthesia.

Patients were evaluated by neck ultrasound, thyroid hormone profile, fine needle aspiration cytology (FNAC), and routine preoperative blood investigation. Patients signed the preoperative written informed consent and were scheduled for either lobectomy plus an isthmectomy or total thyroidectomy according to their disease. The preoperative demographic and clinical data were documented.

All patients were classified according to the block randomization method into either drain group (group A) or non-drain group (group B), this involves balancing of the number of patients recruited to both arms of the study after every 10 recruits. So, it ensured that if the study had been stopped early, there would have been almost the same number of patients in both groups.

All procedures were done by one of the authors under general anesthesia using the same conventional technique, with separate ligation of the branches of the superior thyroid artery, middle thyroid vein and inferior thyroid artery. Furthermore, hemostasis was achieved with bipolar electrocautery. The operating surgeon was informed to put drain or not just before muscle closure. We used natural (Penrose drain) (*Sewoon Medical Co., Cheonan, Korea*). The specimen was sent for histopathological examination.

Group (B) patients were discharged usually after one day of operation while Group (A) patients were discharged after drain removal, this was achieved when drainage fluid was less than 15 mL over eight hours. At discharge, all subjects were instructed to report any post-operative swelling.

Other relevant data as type of surgery, duration, intraoperative blood loss, drain use, postoperative hematoma, and length of stay were also documented in a standard form, and were verified to check its statistical significance. Standard descriptive statistics were used to summarize the demographic and clinical data, surgical operations and outcomes. The statistical analysis was done using the Statistical Package for Social Science Version 16 software package (*SPSS, Inc., Chicago, Illinois, USA*). Statistical significance was set at P-value <0.05.

3. Results

During the period of study, 108 patients underwent thyroidectomy, 94 females and 14 males (female:male ratio of 7:1.6) with mean age of 38.02 years (range 14–72 years). Both groups were consisted of 54 patients. There was no statistically significant difference in the age, gender, and histopathological results of the patients of both groups (Table 1).

No significant differences were found among both groups regarding type of the operation, operative time in minutes and operative blood loss (Table 2). Postoperative hospital stay is markedly increased in group (A) (37.3 h (range 21.4–72.6 h) versus 21.2 h (12.4–59.3 h) in group (B) with significant difference between both groups ($p = 0.001$ & 95% confidence intervals) (Fig. 1)).

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