

# INCISION CARING FOR THYROID NODULES SURGERY WITHOUT DRAINAGE AT HANOI MEDICAL UNIVERSITY HOSPITAL

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*Thyroid nodules are the most common among endocrine gland tumors, including benign thyroid nodules and thyroid cancer. Surgery is the mainstay of treatment in thyroid nodules. Drainage making patients more painful after surgery, and at the same time prolonging hospital stay. WE conducted a randomized controlled trial. Study subjects were randomly divided into 2 groups: placement of drainage and no drainage by random selection before surgery. Total of 84 study subjects include patients with thyroid nodules who underwent surgery at the Department of Oncology and Palliative Care, Hanoi Medical University Hospital from May 2018 to November 2018. Average age was  $47.12 \pm 11.2$  (17 - 76) years old; tumor palpable sign was 58.3%; 58.3% of nodules are in two lobes and nodules  $\leq 10\text{mm}$  was 39.3%, TIRADS 4: 76.2%; and 58.3% thyroid cancer and 41.7% benign thyroid nodule. Univariate analysis of clinical characteristics between the two study groups: Similarities in age group, tumor size, number of tumors, histological diagnosis between the two intervention groups. Group without drainage had VAS0:  $3.8 \pm 0.2$ , VAS1:  $2.3 \pm 0.8$ , complications of fluid collection accumulation 9.5%, subcutaneous hematoma accumulation 4.8%, hypoparathyroidism 4.8%, hoarseness 7.1%, no cases of bleeding requiring reoperation and postoperative infection, hospital stay  $4.7 \pm 0.5$  days, satisfaction level  $4.6 \pm 0.5$ , higher than drainage group. No drainage in several thyroid surgery cases is safe, with shortened surgery period, hospitalized period, and brings comfort and convenience to patients in the postoperative period.*

**Keywords:** Thyroid surgery, drains, outcomes, incision caring.

## I. INTRODUCTION

Thyroid nodules are the most common among endocrine gland tumors, including benign thyroid nodules and thyroid cancer. Benign thyroid tumors account for over 95% of case and mainly in women.<sup>1</sup> Thyroid cancer is the most common endocrine malignancy and accounts for 3.1% of global cancer incidence. According to GLOBOCAN (2020), 586,202 new cases were estimated worldwide, with differences by geographical area, age and sex, ranking 9th in incidence in both sexes, ranking

5<sup>th</sup> in women.<sup>2</sup> The estimated incidence of thyroid cancer in Vietnam in 2020 was 9.8 per 100,000 in women and 3.1 per 100,000 in men, showing that thyroid cancer is increasing.<sup>2</sup>

Surgery is the mainstay of treatment in thyroid nodules. In the past, surgeons often applied the placement of drainage after thyroid surgery in order to monitor postoperative bleeding and limit postoperative fluid accumulation.<sup>3,4</sup> However, recent studies in the world have shown that the placement of drainage after thyroid surgery does not contribute to the monitoring of postoperative bleeding and does not reduce complications of fluid accumulation and hypoparathyroidism... Moreover, drainage makes patients more painful after surgery, also prolongs time of hospital stay.<sup>5,6</sup> In contrast, not

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using drainage after some thyroid surgery can overcome these limitations. At the Department of Oncology and Palliative Care, Hanoi Medical University Hospital, a thyroid nodules surgery without drainage has been implemented in

recent years. This study aims to compare the safety of thyroid surgery not using drainage with traditional surgery with drainage and clinical characteristics of thyroid nodule patients in our department.

## II. METHODS

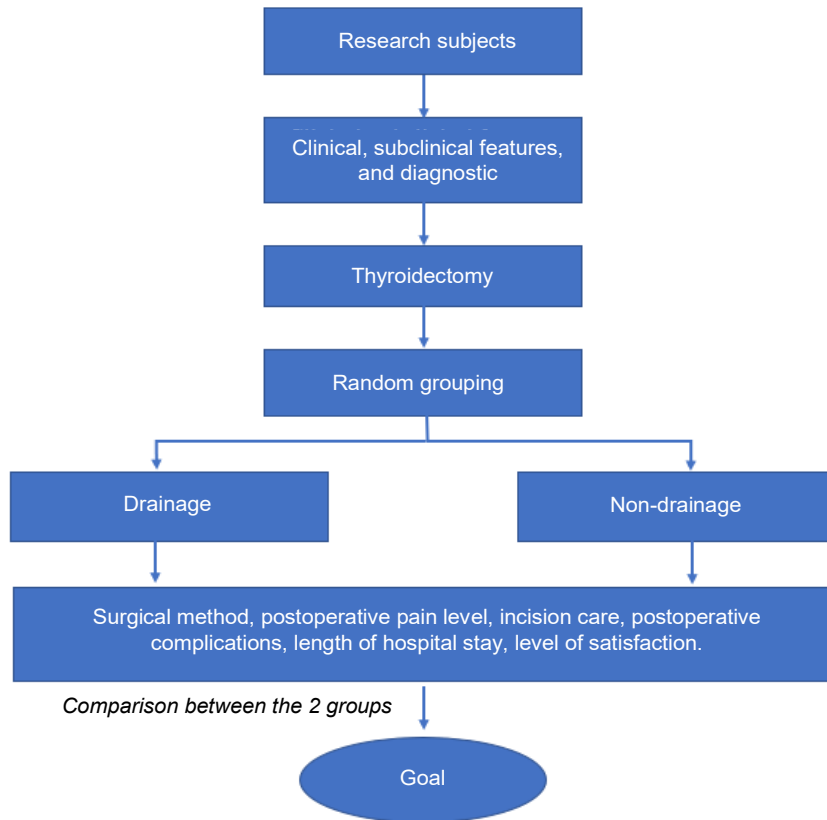


Figure 1. Study process

### 1. Study subject

Include patients with thyroid nodules who underwent surgery at the Department of Oncology and Palliative Care, Hanoi Medical University Hospital from May 2018 to November 2018.

**Inclusion criteria:** All patients underwent surgery to treat thyroid nodules including thyroid cancer (total thyroidectomy with lymph node dissection group VI, and thyroid lobectomy and

isthmusectomy) and benign thyroid nodules (total thyroidectomy and thyroid lobectomy).

**Exclusion criteria:** Surgery for thyroid cancer with lateral cervical lymph node dissection, or with extensive resection of surrounding tissues including: sternothyroid muscle, sternohyoid muscle; detection of metastases in the lateral cervical lymph nodes through clinical examination, ultrasound or intraoperatively; mediastinal goiter; patients

have a history of blood disease; or patients have a history of previous cervical surgery.

## 2. Methods

**Study design:** Randomized controlled trial (RCT). Study subjects were randomly divided into 2 groups: placement of drainage and no drainage by random selection before surgery.

**Sampling:** Convenience sampling on cluster of 84 cases and participants were selected from those who were diagnosed with thyroid nodules and met all criteria.

**Data collection and analysis:** We directly interviewed collected patients by designed questionnaires. Information about surgical method, postoperative complications and pain level, incision wound care, length of hospital stay, and level of satisfaction were recorded. The process of data coding, entry and analysis was done by using SPSS software version 22.0.

## 3. Research ethics

Eligible patients received detailed explanation about the study, and patients who agree to participate in the study was asked to sign a volunteer form for participation in the study. All detailed information about the patient's medical condition is encrypted into strict confidentiality.

## III. RESULTS

### General characteristics

The average age was  $47.12 \pm 11.2$  (17 - 76) years old. The most common age group is from 40 to 50 years old, accounting for 37.5%. The disease mainly occurs in women, accounting for 93%. Most patients had no history of thyroid disease (79.8%), the number of patients who knew about thyroid nodules but did not have treatment was the second highest rate (19%), a very small number of patients had a genetic or family history of the disease (1.2%).

### Clinical and subclinical

Almost of patients discovered thyroid tumors by chance through regular checkup, accounting for 48.8%; 27.4% of patients was admitted to the hospital because of detection of neck tumor. Following that, swallowing problems occurred in 15 cases (17.9%), hoarseness was found in only 7 patients (8.3%).

Nodules in two lobes accounted for the highest rate of 49/81 cases, accounting for 58.3%. Nodules in the left and right lobes accounted for 23.8% and 17.9%, respectively. Most of the cases had hormone tests FT3, FT4, TSH within normal limits of 92.9%, 73.8% and 89.3%, respectively.

### Surgical method

**Table 1. Surgical method**

Characteristics	ND	D	Total	p-value
TT + GVIL	18 (42.9)	21 (50.0)	39 (46.4)	1
TT	5 (11.9)	12 (28.6)	17 (20.2)	0.25
Lobe and isthmus/ lobe	19 (45.2)	9 (21.4)	28 (33.3)	0.08

TT: total thyroidectomy

GVIL: group VI lymphadenectomy

The highest rate of total thyroidectomy with group VI lymphadenectomy accounted for 46.4%. Lobectomy with isthmusectomy or

simple lobectomy in 28/84 patients (accounting for 33.3%). Simple total thyroidectomy was the lowest in 17 cases, accounting for 20.2%.

Postoperative care

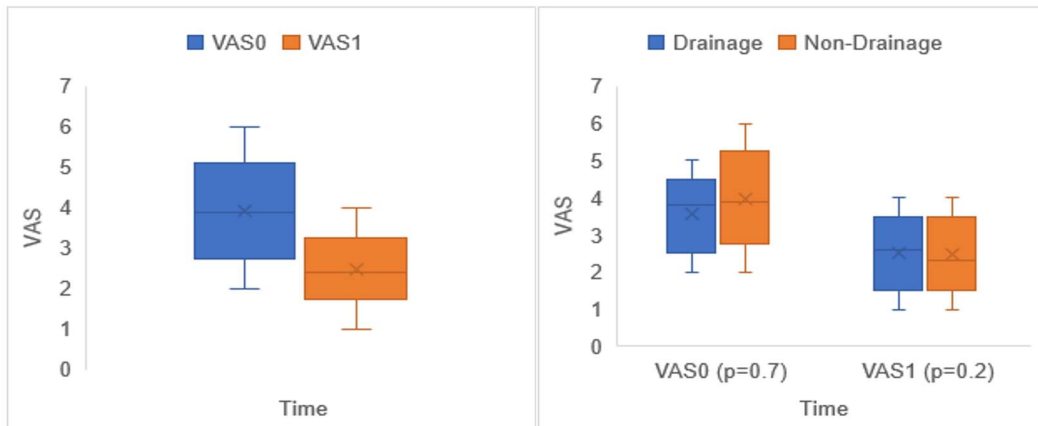


Figure 2. Postoperative pain level on day 0 vs day 1; and between the two groups

Postoperative pain level day 0 (on average  $3.8 \pm 1.1$ ) is statistically significantly higher than on day 1 ( $2.4 \pm 0.9$ ;  $p < 0.001$ ). The postoperative pain level on day 0 in the drainage group  $3.8 \pm 0.9$  did not differ from the postoperative pain on

day 0 in the non-drained group  $3.8 \pm 0.2$  points,  $p = 0.84$ . The postoperative pain level on day 1 in the drainage group  $2.6 \pm 0.9$  did not differ from the postoperative pain on day 1 in the group without drainage  $2.3 \pm 0.8$ ,  $p = 0.14$ .

Table 2. Comparison of complications

Characteristics	Non-drained	Drainage	OR (95%CI)
Seroma	4 (9.5)	2 (4.8)	0.5 (0.08 - 2.7)
Hematoma under the skin	2 (4.8)	3 (7.1)	1.5 (0.2 - 9.7)
Hypoparathyroidism	2 (4.8)	2 (4.8)	1.0 (0.1 - 7.5)
Hoarseness	3 (7.1)	1 (2.4)	0.3 (0.03 - 3.2)
Bleeding	0 (0)	0 (0)	-
Infection	0 (0)	0 (0)	-

Complications of seroma after surgery were the most common (7.1%), of which there were 4 cases in the non-drained group (9.5%), 2 cases in the drainage group (4.8%); subcutaneous hematoma appeared (5.6%); hypoparathyroidism were found in 4 patients after surgery, accounting for 4.8%; hoarseness appeared accounting for 4.8%. There were no cases of postoperative bleeding complications, and surgical site infection.

The average length of hospital stay in the non-drainage group was  $4.7 \pm 0.5$  days, which was statistically significantly lower than the mean length of stay in the drainage group:  $5.5 \pm 0.96$  days, with  $p < 0.001$ . Regarding to the level of satisfaction and comfort after surgery, the group without drainage had a mean score of  $4.6 \pm 0.5$  that was statistically significantly higher than that of the drainage group of  $4.3 \pm 0.6$ ,  $p = 0.005$ .

## IV. DISCUSSION

### General characteristics

The most common age group suffering from thyroid tumors is 40-50 years old, accounting for 37.5%. According to research by Ta Ha Phuong (2017), the most common age group is from 40 to 50 years old, accounting for 21.1%.<sup>7</sup> Women are more likely to have the disease than men, accounting for 93%. This result is also consistent with the study of Ta Ha Phuong (2017) accounting for 94.5%.<sup>7</sup>

### Clinical and subclinical

The majority of patients with regular check-up detected thyroid nodules accounting for 48.8%, this result was consistent with the study of Ta Ha Phuong (2017) where 45.8% of thyroid nodules patients were accidentally discovered the disease.<sup>7</sup> This number is much higher than the studies of Nguyen Van Hung (2013) of 6.9%, Nguyen Xuan Phong (2011) of 5%.<sup>8</sup> This difference may be due to the difference in the location of the study because the Hanoi Medical University Hospital is one of the hospitals with a large number of primary health check-ups.

The most common TIRADS 4a accounted for 38.1%, followed by TIRADS 4b accounted for 26.2%, there were 2 cases, 4.1% TIRADS 3 diagnosed thyroid cancer. This result is similar to the study of Tran Van Thong (2014) 71.1% with TIRADS 4, Nguyen Xuan Hau (2019) TIRADS 4b 42.3%, TIRADS 4c 27.1%. The TIRADS classification is applied to evaluate the properties of thyroid nodules through the characteristics of shape, contour, solid nodule, echogenicity, and microcalcification.<sup>9</sup> At the Department of Oncology and Palliative Care - Hanoi Medical University Hospital, the rate of thyroid cancer surgery is higher than that of benign nodules, leading to TIRADS 4 accounting for the majority of cases.

### Surgical method

All patients were operated by the same team and used the same intraoperative equipment including ligasure scalpel, electric scalpel and bipolar. According to the research of Ta Ha Phuong (2017) conducted on thyroid nodule surgery patients, in the benign thyroid nodule group, there are many surgical methods applied, the majority is lobectomy 25%, nearly all thyroidectomy 25%, total thyroidectomy 16.7%; In the group of thyroid cancer, total resection accounted for 98.4%, lobectomy and isthmus resection accounted for 1.6%.<sup>7</sup>

### Postoperative care

In our study, the condition of the incision during daily dressing changes was better day by day. Although we did not routinely evaluate the neck after thyroidectomy, only for the first 3 days, our present data suggested that the fluid that was discharged immediately after uncomplicated thyroidectomy was able to be absorbed without drainage and with no formation of seroma, in which intervention was required. With regard to the selective use of drains, Hurtado-Lopez, et al. reported that the size of the gland, diagnosis, type of surgery, amount of transoperative bleeding, and complications did not affect the postoperative course, regardless of the use of a drain.<sup>10</sup> Results of postoperative pain levels are consistent with the clinical trial of Papavramidis with no difference in postoperative pain between the two groups.<sup>11</sup> However, other authors found that in the group without drainage, patients had less pain. According to Woods' meta-analysis (2014), postoperative pain was significantly lower in the non-drainage group than in the drainage group with a mean difference of 1.46 (0.67 - 2.26).<sup>5</sup> According to previous studies, the rate of postoperative seroma complication ranges from 1-6% of thyroidectomy cases.<sup>12,13</sup> This rate according to the study of Suslu (2005)

is 1.2%, Lee (2006) is 11/198 (5.6%), Colak (2008) is 3.4%, Deveci (2013) was 7/400 (1.8%). Our study results are consistent with Lee's (2006) study when conducted on a similar group of patients including group VI lymphadenectomy in thyroid cancer. The difference from the rest of the studies is due to the study design of different authors. In fact, the rate of postoperative seroma complications is mainly related to total thyroidectomy and group VI lymphadenectomy. There were no case of postoperative seroma complications in the group of lobectomies and isthmusectomy or lobectomy alone. This difference was due to the larger postoperative dead space and surgical area in the total thyroidectomy and lymph node dissection group compared with the other group. Analyzing the difference in the rate of seroma complications between the 2 groups, we found that the results were consistent with the meta-analytical study of Tian (2017), Sanabria (2007) with OR (95%CI) respectively, 0.67 (0.36 - 1.24) and 1.06 (0.62 - 1.82).<sup>6</sup> In all 6 cases of postoperative seroma through clinical examination, there were no case requiring intervention by aspiration or drainage. The fluid was self-absorbed after a mean of  $2.7 \pm 0.4$  weeks.

Five of cases of complications of subcutaneous hematoma in our study were caused by bleeding from the incision edge, 2 patients in non-drainage group and 3 in drained group. We applied pressure bandage to stop bleeding successfully and skin color returned to normal after  $7.8 \pm 1.3$  days. During observed times, in the drainage group, we looked for the amount and color of fluid in drain bulb, clinical signs and symptoms like size and color of neck mass, dyspnea, stridor... and in non-drainage group, we focus on clinical conditions only. Bleeding and hematoma formation after surgery can come from the edge of the incision, the drain

insertion site, the strapmuscle/ sternothyroid muscle or the thyroid bed. Therefore, it is important to limit this complication by careful perioperative hemostasis and the closure of the incision according to anatomical layers because blood flowing from the incision edge can spread into the deep layers of the neck to the space around the trachea which lead to the formation of a hematoma that compresses the airways.<sup>14</sup> Even when a drainage tube is placed, the formation of a hematoma around the trachea and blood clots may blocks the drain tube creating difficulty in monitoring postoperative bleeding complications.<sup>15,16</sup> In addition, the authors also noted that bleeding post-operative complications often occur in the first 24 hours, most often in the first 2 to 6 hours, so it is necessary to closely monitor clinical signs, especially in cases of blocked drainage due to blood clot formation.<sup>14</sup> To limit bleeding complications and hematoma formation, some authors use one of the following intraoperative maneuvers: the Valsalva maneuver or position the patient in the Trendelenburg position or stimulate the airway to induce coughing before wound closure. Among them, the Valsalva maneuver is considered to be the safest. In addition, some antiemetics and corticosteroids that reduce postoperative vomiting also contribute to the reduction of hematoma formation.<sup>16</sup>

Number of days in the hospital was also consistent with the meta-analysis of Woods (2007), the mean difference between the 2 groups was 1.25 days (0.83 - 1.68).<sup>5</sup> Similarly in the study of Tian (2017), the hospital stay in the non-drainage group was shorter on average 1.16 days (0.72 - 1.59) with  $p < 0.001$ .<sup>6</sup> In our study, when surveying about comfort in the postoperative period, it was based on a 5-point scale of patient rating. We found that

the non-drainage group had a higher level of satisfaction than the drainage group,  $p = 0.005$ . Patients in the non-drainage group felt more convenient during their daily activities and wound care. In addition, according to the author Corsten (2005), some patients may appear small scars at the drainage foot site, affecting the aesthetics.<sup>17</sup>

## V. CONCLUSION

No routine drainage in uncomplicated thyroid surgery (non high-risk bleeding cases based on intraoperative assessment of surgeons) is safe, shortens hospitalized period, bringing comfort and convenience to patients in the postoperative period.

## REFERENCE

- Holzheimer RG, Mannick JA, eds. *Surgical Treatment: Evidence-Based and Problem-Oriented*. Zuckschwerdt; 2001.
- Bray F, Ferlay J, Soerjomataram I, et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018;68(6):394-424. doi:10.3322/caac.21492
- Shaha AR, Jaffe BM. Selective use of drains in thyroid surgery. *J Surg Oncol*. 1993;52(4):241-3. doi:10.1002/jso.2930520409
- Ardito G, Revelli L, Guidi ML, et al. Drainage in thyroid surgery. *Ann Ital Chir*. 1999;70(4):511-6; discussion 516-7.
- Woods RS, Woods JF, Duignan ES, et al. Systematic review and meta-analysis of wound drains after thyroid surgery. *Br J Surg*. 2014;101(5):446-56. doi:10.1002/bjs.9448
- Tian J, Li L, Liu P, et al. Comparison of drain versus no-drain thyroidectomy: a meta-analysis. *Eur Arch Otorhinolaryngol*. 2017;274(1):567-577. doi:10.1007/s00405-016-4213-0
- Ta PH. Review of clinical, paraclinical and surgical results of thyroid tumors in Hanoi Medical University Hospital. General doctor graduation thesis, Hanoi Medical University. 2017.
- Nguyen PX. Research on clinical characteristics and some laboratory tests results in thyroid carcinoma. Master of medicine thesis, Hanoi Medical University. 2011.
- Kwak JY, Han KH, Yoon JH, et al. Thyroid imaging reporting and data system for US features of nodules: A step in establishing better stratification of cancer risk. *Radiology*. 2011;260(3):892-9. doi:10.1148/radiol.11110206
- Hurtado-López LM, López-Romero S, Rizzo-Fuentes C, et al. Selective use of drains in thyroid surgery. *Head Neck*. 2001;23(3):189-93. doi:10.1002/1097-0347(200103)23:3<189::aid-hed1017>3.0.co;2-y
- Papavramidis T. Classic clamp-and-tie total thyroidectomy for large goiters in the modern era: To drain or not to drain. *World Journal of Otorhinolaryngology*. 2014;4:1. doi:10.5319/wjo.v4.i1.1
- Gonçalves Filho J, Kowalski LP. Surgical complications after thyroid surgery performed in a cancer hospital. *Otolaryngol Head Neck Surg*. 2005;132(3):490-4. doi:10.1016/j.otohns.2004.09.028
- Ozbas S, Kocak S, Aydintug S, et al. Comparison of the complications of subtotal, near total and total thyroidectomy in the surgical management of multinodular goitre. *Endocr J*. 2005;52(2):199-205. doi:10.1507/endocrj.52.199
- Deveci U, Altintoprak F, Sertan Kapakli M, et al. Is the use of a drain for thyroid surgery realistic? A prospective randomized interventional study. *J Thyroid Res*. 2013;2013:285768. doi:10.1155/2013/285768

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15. Suslu N, Vural S, Oncel M, et al. Is the insertion of drains after uncomplicated thyroid surgery always necessary? *Surg Today*. 2006;36(3):215-8. doi:10.1007/s00595-005-3129-x

16. Koch WM. Chapter 36 - Complications of Surgery of the Neck. In: Eisele DW, Smith RV,

eds. *Complications in Head and Neck Surgery (Second Edition)*. Mosby; 2009:439-465.

17. Corsten M, Johnson S, Alherabi A. Is suction drainage an effective means of preventing hematoma in thyroid surgery? A meta-analysis. *J Otolaryngol*. 2005;34(6):415-7. doi:10.2310/7070.2005.34609