

IS IT ESSENTIAL TO KEEP A DRAIN AFTER THYROID SURGERY ?

M. NAJMUDDIN SHABBIR

Department of Surgery, Fatima Jinnah Dental College, Karachi

ABSTRACT:

Objective: To evaluate the necessity of keeping a drain after thyroid surgery.

Design & Duration: A randomized, prospective, control study conducted over a period of three years.

Setting: Department of Surgery, Fatima Jinnah Dental College, Karachi.

Patients: 94 patients undergoing 102 thyroid surgeries.

Methodology: Patients included in the study were randomly allocated to drain and non-drain group. The surgeon was informed of the group just before the closure of the wound. Ultrasonography (USG) of the neck was done on first and seventh post-operative day by the same ultrasonologist each time, to assess the amount of collection in the thyroid bed. Any swelling, change in voice, tetany and tingling sensation were also recorded. The data was analyzed using two-sample test for calculating unequal variance.

Results: Both groups were evenly balanced according to age, sex, size of tumors, type of procedure performed and histopathological diagnosis. There was no significant difference in the fluid collection at the thyroid bed as assessed by USG on Day-1 and Day-7 in the two groups ($p=0.313$), but the hospital stay was significantly reduced in the non-drain group ($p=0.007$). One patient in the drain group required needle aspiration for collection in the thyroid bed. No patients in either group required re-operation for bleeding or haematoma.

Conclusion: Routine drainage of thyroid bed following thyroid surgery may not be necessary. Not draining the wound results in lesser morbidity and decreased hospital stay.

KEY WORDS: Thyroidectomy, Drains, Haematoma, Seroma, Hospital Stay, Ultrasonography

INTRODUCTION

Most surgeons give in to the tradition of leaving a drain following thyroid surgery with the hope that this will obliterate the dead space and evacuate collected blood and serum. This belief is further reinforced by the fact that postoperative drains usually yield fluid. The need for drainage has been questioned after various types of surgeries with much larger potential dead spaces like cholecystectomy and colonic anastomosis^{1,2}. These procedures are now routinely not drained. Blood and serum that they are supposed to drain usually block drains. They add to discomfort, give extra scar and increase

hospital stay. We carried out a prospective randomized study to assess the role of drains after thyroid surgery by monitoring objectively the fluid collection in the thyroid bed using ultrasonography.

PATIENTS & METHODS

The study was carried out on 94 patients who underwent 102 thyroid surgeries between the years 2001-2004 by the same surgeon. This discrepancy of eight patients was due to the fact that these cases were reoperated i.e. they underwent complete thyroidectomy following a biopsy report of previous surgery as well differentiated thyroid carcinomas. However, they were randomized as fresh cases with no consideration given to previous surgery. Patients with cervical lymph nodes metastases requiring neck dissection and those with clinical or laboratory indicators of coagulation disorders were excluded from the study. No patient was excluded on the basis of size of the gland, difficulty in surgery, surgery involving both lobes and re-operation in the

Correspondence:

Dr. M. Najmuddin Shabbir, Assoc. Prof. Surgery,
Fatima Jinnah Dental College, Karachi.
Phones: 0300-8229833
E-mail: drnajamshabbir461@hotmail.com

neck. All patients underwent routine preoperative and postoperative laryngoscopy (indirect/direct) as part of the protocol at our center. The patients were randomly allocated to drain and non-drain group. The operating surgeon was informed of the group just before closure of the wound. In the drain group a closed suction drain with negative pressure (Redivac) was brought out through a separate wound.

Ultrasound of the neck using B-mode with linear frequency of 7.5 MHz was performed in both the groups between 24-48 hours of surgery and seventh postoperative day each time by the same radiologist or under his supervision. Volume of fluid collection in the operative bed was calculated by measuring the maximum diameter in three dimensions. The volume of fluid collected in the suction drain was measured separately.

The drains were removed in all patients after 48 hours. Before the present study was contemplated, a pilot study was carried out on 20 patients (excluded from the present study) to ascertain the duration of drainage and the drains were removed after the discharge reduced to less than 30ml in 24 hours. It was observed that the average time taken for the drains to be removed was four days while the ultrasound assessment did not reveal any collection in the thyroid bed after 48 hours.

On the basis of these findings it was decided to keep the drains for 48 hours in order to compare the morbi-

dity in the two groups. Therefore a 48 hrs. cut-off period for removal of drains was considered. All patients were observed for any postoperative respiratory distress, any change in voice, fluid collection, tingling sensations or/and tetany. The specimens were subjected to histopathological examination for final confirmation of diagnosis. Using two sample "t" test all the data was statistically analyzed for any significant difference in the two groups regarding:

- fluid collection in thyroid bed on Day-1 & Day-7.
- size of nodule and the amount of fluid collection.
- complication rate.

RESULTS

The average age of the patients in the present study was 34.56 years (range 8-60 years). The male to female ratio was 1:6.84, with equal distribution in both the groups based on the type of surgery and the size of nodule. The amount of fluid collection in thyroid bed as assessed by USG for both the groups on Day-1 & Day-7 is shown in Table I. Two-sample T-test was applied for detecting any difference in means of fluid collected between the two groups (Table II). There was no statistically significant difference in the volume of fluid collection on Day-1 ($p=0.371$) and Day-7 ($p=0.577$) between the two groups. On the other hand the amount of fluid collected in the suction drain was noted for 48 hours. The average collection was 167.14 ml (range 30-120 ml/day).

Table I. Volume of fluid collection in the two groups as assessed by USG on Day-1 & Day-7

Amount of Fluid	Drain Group		Non-Drain Group	
	Day-1	Day-7	Day-1	Day-7
Mean	3.258 ml	1.819 ml	2.345 ml	1.366 ml
Minimum	-- ml	-- ml	-- ml	-- ml
Maximum	40 ml	35 ml	19 ml	14.2 ml
Total No. of Patients	51	51	51	51

Table II. Two sample T test detection of difference in means of fluid collected on Day-1 & Day-7, T= Difference in size of Thyroid Nodule in the two groups, DF= Difference in the Amount of Fluid collected

Unequal Variance	T	DF	P-Value
Day-1	0.91	81.5	0.371
Day-7	0.58	72.9	0.577

Amount of Fluid	Drain Group		Non-Drain Group	
Nodule Size	< 4 cms	> 4 cms	< 4 cms	> 4 cms
Mean Day-1	2.30 ml	5.935 ml	2.245 ml	2.011 ml
Total number of patients	37	14	34	17

Table III. Chi Squared approximation for difference in Volume of Collection based on size on Day-1, $p=0.313$ (not significant)

Amount of Fluid	Drain Group		Non-Drain Group	
Nodule Size	< 4 cms	> 4 cms	< 4 cms	> 4 cms
Mean Day-7	0.965 ml	1.965 ml	1.388 ml	1.244 ml
Total number of patients	37	14	34	17

Table IV. Chi Squared approximation for difference in Volume of Collection based on size on Day-7, $p=0.0712$ (not significant)

Average size of the thyroid nodule was 4.03 cms and 4.12 cms in the drain and non-drain groups respectively. Kruskal-Wallis one way non-parametric analysis showed no significant statistical difference in the amount of collection according to size of nodule arbitrarily taken as <4cms and >4cms on Day-1 and Day-7 respectively (Table III & IV).

Average duration of hospital stay was 3.715 days for the entire group; 4.35 days for drain group and 3.07 days for the non-drain group. This was statistically significant when analyzed using the two-sample T test ($p=0.0072$).

Complications that were observed in the present study are shown in Table V. Of the six patients who developed collections, four had undergone bilateral subtotal thyroidectomy with an average amount of 13.40 ml. Only one patient from the drain group required single

aspiration. None of the patients had respiratory distress. Three patients had tingling sensation, while two developed transient tetany. Five patients developed transient change in voice, four of these belonged to drain group, the difference being non-significant ($p=0.36$). One patient in each group developed wound infection.

DISCUSSION

Drains have been traditionally used in most of the surgical procedures with limited evidence to suggest any benefit^{1,4}. The present prospective randomized study has failed to show any advantage of the routine use of drains after uncomplicated thyroid surgery. Except for patients undergoing simultaneous neck dissection or coagulation disorder no other exception was made.

Other authors in randomized studies reported similar result with sample size varying from 100-200 patients^{5,10}. Two large non-randomized studies of 250 and 400 patients have also documented no benefit of using drains after thyroid surgery^{11,12}.

Objective assessment of fluid collection in the thyroid bed by USG has been done very infrequently in randomized settings. Debry et al⁵ have used it selectively in two patients who developed postoperative haematoma while Schwartz¹³ used it to compare the two types of drains. In the present study absence of fluid in the thyroid bed on ultrasound, but its presence in the suction drain could therefore be due to the drain itself⁸. The drains by virtue of the inflammation induced due to their pre-

Table V. Comparison of Complications

Complication	Drain Gp.	Non-Drain Gp.
Collection	3	3
Tetany	—	2
Tingling	1	2
Infection	1	1
Voice change	4	1

sence may actually increase the drainage. The vacuum created by the negative suction of the drain may prevent the lymphatics from sealing off and thus cause increase in the seroma formation and drainage^{5,9}.

CONCLUSION

The present randomized study highlights that placement of drains after routine thyroid surgery may induce rather than prevent fluid collection. It is not related to the type of surgery or size of nodule, has no influence on complications, leads to an extra scar and may increase hospital stay (if the patients can not be discharged with drains in-situ). Meticulous haemostasis and attention to finer details during surgery are more important. Hence we conclude that the routine use of drains after thyroid surgery is not necessary.

REFERENCES

1. Lewis RT, Goosall RG, Marien B, Park M, Lloyd-Smith W, Weigand FM. Simple elective cholecystectomy: to drain or not. *Am J Surg* 1990; 159: 242.
2. Hoffmann J, Lorentzen M. Drainage after cholecystectomy. *Br J Surg* 1985; 72: 423-427.
3. Hoffmann J, Shokouh-Amiri M, Damm P, Jensen R. A prospective controlled study of prophylactic drainage after colonic anastomoses. *Dis Colon Rectum* 1987; 30: 449-452.
4. Johnson CD, Lamout PM, Orr N, Lennox M. Is drain necessary after colonic anastomosis? *J R Soc Med* 1989; 82: 661-664.
5. Debry C, Renou G, Fingerhut A. Drainage after the thyroid surgery: a prospective randomized study. *J Laryn Oto* 1999; 113: 49-51.
6. Peix JL, Teboul F, Feldman H, Massard JL. Drainage after thyroidectomy: a randomized clinical trial. *Int Surg* 1992; 77: 122-124.
7. Ayyash K, Khammash M, Tibblin MS. Drain versus no drain in primary thyroid and parathyroid surgery. *Euro J Surg* 1991; 157: 113-114.
8. Wihlborg O, Berglilung L, Matensson H. To drain or not to drain in thyroid surgery: a controlled clinical study. *Arch Surg* 1988; 123: 40-41.
9. Kristofferson A, Sandzen B, Jarhult J. Drainage in uncomplicated thyroid and parathyroid surgery. *Br J Surg* 1986; 73: 121-122.
10. Schoretsanitis G, Melisas J, Sanidas E, Chirstodoulakis M, Vlachonikolis JG. Does draining the neck affect morbidity following thyroid surgery? *Am J Surg* 1998; 64: 778-780.
11. Shaha AR, Jaffe BM. Selective use of the drain in thyroid surgery. *J Surgical Oncology* 1993; 52: 241-243.
12. Arriyanayagam DC, Narayan Singh V, Busby D, Sieunarine K, Raju G. Thyroid surgery without drainage ; 15 years of clinical experience. *J Royal Coll Surg Edin* 1993; 38: 69-70.
13. Schwartz W, Willy, Ndzee C, Gerugross H. Gravity or suction drainage in thyroid surgery? Control of efficacy with ultrasound determination of residual haematoma. *Arch Surg* 1996; 381: 337-342.