

Importance of Drainage in Thyroid Surgery: A Study

Walvekar R.S. ,Bhogawar S.D. ,Ugane S.P.

OBJECTIVE: To assess the comparative analysis of usefulness of drains after thyroid surgery.

Design and duration: A prospective randomized experimental study conducted over a period of one year, from Jan 2012 to Dec 2012. Setting: Surgical Unit-I, GMC Miraj and P.V.P.G.H. Sangli.

Methodology: A total of 120 patients presented with Goiter randomly allocated equally to drain and non-drain groups. The surgeon was informed of the group just before the closure of wound. Ultrasonography of the neck was done postoperatively on Day-1 and Day-4 by same sonologist, each time to assess the fluid collection in thyroid bed. Any change in voice, wound infection or respiratory distress was also recorded. The data was analyzed by descriptive and inferential statistics.

Results: Both groups were evenly balanced according to age, gender, size of thyroid gland, volume of resected thyroid gland, type of procedure and time of operation. Overall fluid collection is more in drain group assessed by USG on Day-1 ($P=.00$) and day Day-4 ($P=.04$) as compared to non-drain group. Regarding post-operative complications 6 patients (10%) in drain group and 4 (6.7%) in non-drain group had change in voice. 6 patients (10%) in drain group had prolonged hospital stay as compared to non-drain group in which no patient recorded. Two patients (6.7%) in non-drain group developed seroma.

Conclusions: Putting of drains after thyroid surgery do not show any advantage to non-drain group regarding peri-operative complications, rather hospital stay is more in patients of drain group.

Key word: Thyroid, Goiter, Drainage, Fluid collection, Seroma, Hospital stay

INTRODUCTION

Drains are traditionally used in most of the surgical procedures [1]. Most surgeons left drain following thyroid surgery with the hope that this will obliterate the dead space and evacuate collected blood and serum. Their role has been questioned after various types of surgeries with much larger dead space like cholecystectomy and colonic anastomosis [1, 2]. Thyroid gland is highly vascular structure. Due to its extensive blood supply of the gland proper surgical skills needed to achieve satisfactory hemostasis. This obviates the need of drainage but many studies have been carried out to assess the role of drains after thyroid surgery suggesting no evidence of benefit [3-9]. Placement of drains after routine thyroid surgery may induce rather than prevent fluid collection [3, 10]. Their use may lead to extra scar and prolong hospital stay [3]. Not draining the wound results in less morbidity and decrease hospital stay. So, by ensuring meticulous hemostasis drains can be avoided even in thyroid surgery. We conducted a randomized control study to assess whether drainage after thyroid surgery is mandatory in every case or not, by dividing the patients in drain and non-drain group. Role of drains was assessed by recording complications like change in voice, respiratory distress, prolonged hospital stay, wound infection and fluid collection objectively by ultrasound.

MATERIALS AND METHODS

Study sample consists of 120 patients, who underwent thyroid surgeries in Surgical Unit-1, GMC Miraj & P.V.P.G.H. Sangli from Jan 2012 to Dec 2012. Patients randomly allocated to 2 groups viz; Drain Group (N:60) and Non-Drain Group (N:60). Hematological tests and coagulation profile, along with thyroid hormone profile, assessment of thyroid nodularity with ultrasound and FNAC were undertaken. Patients with thyroid carcinoma requiring simultaneously neck dissection, laboratory indicator of coagulation disorder and patients with Graves disease were excluded from the study. This has been made prior to group allocation. No patient was excluded on the basis of thyroid size, nodularity, difficulty in procedure and duration of surgery. All patients underwent preoperatively indirect laryngoscopy and informed written consent was taken. The surgeon was informed of the group just before the closure of the wound. In drain group negative suction pressure (Radivac) drain was brought out through a separate skin wound. Ultrasound of the neck using B mode high frequency of 7.5 MHz with linear probe was performed 1st post-operative day and 4th operative day. Each time by the same sonologist in same radiology department. The volume of fluid in suction drain calculated separately and considered a part of drain group. All patients were assessed for post-operative complications like fluid collection in thyroid bed, seroma formation, change in voice, prolonged hospital stay, respiratory distress and wound infection. Data were analyzed by using descriptive and inferential statistics.

RESULTS

In present study out of 120 patients 112 (93.3%) were females and only 8 (6.7%) were males. Mean age of both groups is 39.2 years (range 17-65 years). Both groups equally distributed regarding clinical diagnosis, size of nodule and type of surgery. The amount of fluid collected in thyroid bed assessed by USG on Day-1 and Day-4 for both groups. The fluid in negative suction drains was also calculated separately and added to the drain group fluid assessment. Data were analyzed by descriptive and

inferential statistics. The relationship between both groups and fluid collection on day-1 and day-4 shown in Table 1 and Table 2.

Table 1: Relationship between both groups and fluid collection (on day 1)

Group	FI		fluid collection (ml)			Total
	Nil	1-10 ml	11-20 ml	21-30 ml	31-36 ml	
Drain	0	2	18	36	4	60
		3.3 %	30.0%	60.0%	6.7%	100.0%
Non-drain	16	24	18	12		60
	26.7 %	40.0 %	30.0%	3.3%		100.0%
Total	16	26	36	38	4	120
	13.3 %	21.7 %	30.0%	31.7%	3.3%	100.0%

Chi-square = 34.51 d.f. = 4 P = .000**
Gamma = -.952 ** Highly Significant

Table 1 shows the relationship between both groups (drain & non-drain) and fluid collection in day-1. The chi-square value (34.51) shows a highly significant association between drain group and fluid collection in. The Gamma value shows a strong negative relationship between the variables. Its mean drain group had more fluid as compare to non-drain group on day one. The above results show that only 3.3% patients had 1-10 ml fluid in drain group, 30.0% percent had 11-20 ml fluid, while a large number of the patients (60.0%) had 21-30 ml fluid and 6.7% of them had 31-30 ml fluid in drain group.

Whereas in non drain group, slightly more than one-fourth (26.7%) of the patients had not fluid, while a major proportion (40.0%) of the patients had 1-10 ml fluid, 30.0% had 11-20 ml fluid and only 2 patient had 21-30 ml fluid in non-drain group.

Table 2: Relationship between both groups and fluid-collection (on day 4)

Group	Fluid collection (m)					Total
	Nil	1-10 ml	11-20 ml	21-30 ml	31-36+ ml	
Drain	34	10	2	-	14	60
	56.7%	16.7%	3.3%	-	23.3%	100.0%
Non-drain	46	10	24	-		60
	76.7%	16.7%	6.7%	-		
Total	80	20	6	-	14	120
	66.7%	16.7%	5.0%	-	11.7%	100.0%

Chi-square = 8.23 d.f. = 3 P = .041*

Gamma = -.465 * Significant

Table 2 show the relationship between both groups (drain & non-drain) and fluid collection in day-4. The chi-square value (8.23) shows a significant association between drain group and fluid collection in Table 2. The Gamma value shows a negative relationship between the variables. Its mean drain group had more fluid as compare to non-drain group on day four. The above results show that only majority (57.7%) of the patients had not fluid on day four, while 16.7% had 1-10 ml fluid and 3.3% percent of the patient had 11-20 ml fluid and about one-fourth (23.3%) had 31-36+ ml fluid in drain group on day four.

Whereas a huge majority (76.7%) of the patients in non-drain group had not fluid on day four, while 16.7 percent had 1-10 ml fluid and 6.7% had 21-30 ml fluid in non-drain group on day four. Distribution of complications in both groups is shown in Table 3.

Table 3: Distribution of post-operative complications in Complications in drain and non drain group.

Post operative complications	Drain	Non drain	Total
Respiratory distress	0	0	0
Change in Voice	6	4	10
Seroma	0	4	4
Prolong Hospital Stay	6	0	6
Wound Infection	0	0	0

Above table shows that neither patient suffered from respiratory distress nor wound infection in either group. While 6 patient (10%) in drain group and 4 patient (6.7%) in non-drain group had change in voice, 4 patient (6.7%) developed seroma in non-drain group which resolved spontaneously, 6 patients (10%) had prolonged hospital stay in drain group, while no patient suffered prolonged hospital stay problem in non-drain group.

DISCUSSION

Thyroidectomy is a common procedure done in our setup; mostly patients having multinodular goiters are operated upon, and patients of differentiated carcinoma and Graves disease, after becoming euthyroid by medical treatment are also dealt with. Total or near total thyroidectomies are done virtually in every case. Although thyroid is a very vascular gland but its vascularity is not associated with increased operated bleeding if proper operative techniques are followed. Traditionally people are using negative pressure suction drains in this procedure. Since the last couple of decades some studies have shown that drains are not needed or rather they may be potentially harmful for the patients [3,9]. Theoretically speaking, the negative suction may hinder the lymphatic drainage [3,6,9,11,14] or the drain being a foreign body may induce reactive fluid formation, thus encourage seroma formation [3,10]. In general the incidence of post operative hematoma reported in literature ranges from 0% to 30% [12, 13]. Hematoma can result from inadequate hemostasis at time of closure, ligature slip or increase venous pressure at extubation because of coughing or straining. Neither the use of drains nor bulky pressure dressing prevent hematoma formation. Many authors have demonstrated that the use of drainage after uncomplicated thyroid surgery included total Thyroidectomy, subtotal thyroidectomy and lobectomy does not decrease the rate of complications related to post operative bleeding [3,9]. Some authors have been selective in the use of drains after Thyroidectomy, with the specific indications being to resection of substernal goiter, a large dead space and a raw thyroid bed [7,8]. Even some authors recommend the use of drains in cases of hypervascularity as in Graves disease or extensive dissection of some cancers [4]. In a large meta-analysis of eight series from 1980 till 2005 consisting of 944 patients, there was no statistically significant difference between the rates of post Thyroidectomy hematoma whether or not suction drains were used [15]. Our study has shown that drains should not be used in every case of Thyroidectomy. In our study, the drain group and the non-drain group were homogenous and comparable in regard to type of operation, volume of resected thyroid gland, pathological diagnosis and clinical parameters. Regarding the amount of fluid collection in thyroid bed as measured by USG, the mean in Drain group is 16.83ml vs 3.11ml in non-Drain group in our study. Hospital stay was more in patients with Drain groups. There was no other significant difference in complications regarding change in voice, wound infection and respiratory distress in either group.

CONCLUSION:

Drains are not mandatory but however they are alternative to strict homeostasis in selected group of thyroidectomy patients.

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First Author – DR. RAVINDRA S. WALVEKAR, MBBS, M.S (Gen Surg), Assist. Professor, Department of Gen Surg, BhartiVidyapeeth Medical College, Sangli

Second Author- DR. SUSHIL BHOGAWAR, MBBS, M.S(Gen Surg 2nd yr), P. G. Student 2nd yr, Department of Gen Surg, Government Medical College, Miraj and PVP Govt. Hospital, Sangli., 8975209890, drsushilmsgurg@gmail.com.

Third Author –DR. SUBODH UGANE, MBBS, M.S (Gen Surg), Assistant professor, Department of Gen Surg, Government Medical College, Miraj and PVP Govt. Hospital, Sangli, 9921411355, ugane_subodh@yahoo.co.in

Correspondence Author –DR. SUSHIL BHOGAWAR, MBBS, M.S(Gen Surg 2nd yr), P. G. Student 2nd yr, Department of Gen Surg,, Government Medical College, Miraj and PVP Govt. Hospital, Sangli., 8975209890, drsushilmsgurg@gmail.com