

COMPARATIVE STUDY OF SUCTION DRAIN VERSUS NO SUCTION DRAIN AFTER THYROID SURGERY- A HOSPITAL-BASED STUDY

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ABSTRACT

BACKGROUND

The main complications of thyroid surgery include recurrent laryngeal nerve injury, hypocalcaemia, surgical site infection, haematoma and seroma formation. Post-operative seroma is a common complication. We wanted to study the effectiveness of negative suction drain in preventing seroma formation after thyroid surgery.

METHODS

The present study was a randomized study. Patients who were subjected to either total thyroidectomy or subtotal or hemithyroidectomy in SVS Medical College Hospital, Mahbubnagar during the study period of June 2016 to August 2018 were included. Cases were randomly allocated to either the no drainage (group 1) or the drainage (group 2) group. During the study period, 120 willing patients were included in the study. The volume of fluid collection in the operative bed, postoperative pain, complications, and length of hospital stay, were then recorded. Various presentations, complications and treatments were noted and finally followed up for minimum of 3 months.

RESULTS

Group 1 and group 2 were matched according to age, gender, thyroid volume, type of procedure performed, and histopathological diagnosis. After assessment by USG, no significant difference was found between the groups in the fluid collection of the thyroid bed, but the length of hospital stay was significantly reduced in group 1. Post-operative pain and discomfort was observed more in group 2 compared to group 1.

CONCLUSIONS

This study concludes that there is no significant advantage of suction drain after thyroid surgery routinely. However, suction drain can be considered in cases of large goitres where dead space is extensive and where difficult dissection with significant oozing of blood intra-operatively was encountered.

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BACKGROUND

Thyroid diseases are, arguably, among the commonest endocrine disorders worldwide. India too, is no exception. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India suffer from thyroid diseases.¹

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The promotion of health awareness and recent developments in diagnostic procedure has led to increase in number of goitre cases. In India the prevalence of a palpable thyroid nodule in the community is about 12.2%, according to a recent study.¹ This has led to increase in number of thyroidectomies.² According to previous studies, main complications of thyroid surgeries include recurrent laryngeal nerve injury, hypocalcaemia, surgery site infection, hematoma and seroma formation.³

Collection of fluid within the surgical site during postoperative period is Seroma. The etiopathogenesis of the

seroma is not completely understood. The reported incidence for seroma subsequent to conventional thyroid surgery varies from 1.3% to 7%. Cosmetic problems, regional swelling, flap necrosis, and risk of surgical site infection are the most common complications, due to seroma formation among thyroidectomy patients that lead to prolonged hospital stay and higher admission costs.⁴ It was thought that there are several advantages like obliteration of dead space, decreased incidence of formation of seroma and hematoma if a negative suction drain is placed after surgical procedures including thyroidectomy. However, with the improved surgical instruments and availability of different anti-haemorrhagic sprays for surgical areas, attempts have been made to avoid the insertion of a drainage tube after thyroidectomy.

A seroma and hematoma that develops afterward can be treated by postoperative percutaneous puncture and drainage. However, where dissection is difficult or when other complicating factors are present the usage of suction drainage is recommended. In this study we aimed to investigate the factors that are associated with drain usage by comparing the clinical characteristics of patients who had drains with the patients without drains after thyroid surgery.

METHODS

Settings

Present study was carried out at SVS Medical College and Hospital.

Study Period

Present study was carried out from June 2016 to August 2018.

Sample Size

During the study period, it was possible to include 120 eligible cases.

Follow Up Period

After the management each patient was followed for three months.

Inclusion Criteria

1. Patients diagnosed with goitre undergoing any form of thyroid surgery.

Exclusion Criteria

1. Patients not willing to be part of the present study were excluded (those who were not willing to stay in hospital for more than 48 hours) from the present study even though they were having goitre and some form of thyroidectomy was done.
2. Patients with malignancy where lymph nodal dissection was carried out along with thyroid surgery.

Depending on the diagnosis either total thyroidectomy, subtotal thyroidectomy or hemi thyroidectomy was done. Wound closure was done after securing complete haemostasis. A 3.0 absorbable (Catgut or Vicryl) suture was used to close the wound. For group 2 patients a 10 FG Romovac suction drain was inserted through a separate wound. After 48 hours an ultrasound of the neck was done in all patients to measure the fluid collection in the post-operative bed. The fluid collected in the drain measured separately in group 2 patients. In group 2 patients suction drain collection measured every 24 hours. The drains were removed in group 2 patients once the collected fluid is less than 20 ml in 24 hours.

Follow-Up

All patients were discharged around 2-10 days after surgery. They were all followed up at 15 days, 1 and 3 months.

Statistical Analysis

The data was analysed using proportions.

RESULTS

Demographic and Clinical Characteristics		Number			%
		Group 1	Group 2	Total	
Age (Years)	16-25	5	7	12	10
	26-35	13	15	28	23
	36-45	18	15	33	27.5
	46-55	13	12	25	21
	56-65	7	8	15	12.5
	> 65	4	3	7	6
Sex	Male	5	6	11	9.1
	Female	55	54	109	90.9
Side Affected	Hemithyroidectomy	40	32	72	60
	Total Thyroidectomy	17	24	41	34
	Subtotal Thyroidectomy	3	4	7	6

Table 1. Distribution of Study Subjects as Per Demographic and Clinical Characteristics

The age of the patients ranged from 16 to 75. Commonest age group affected was between 26-55 yrs. (71.5%). Age distribution here is consistent with another study "Thyroid cancer and nodular goiter of thyroid: An analysis of patients in rural South Tamil Nadu" by Johnsy

Merla, Shantaraman et al total 522 patients analysed. Nearly 88.5% of the patients were between 21 and 60 years, and 5.36% were above 60 years.⁵

Out of 120 patients 109 (90.9%) were female and 11 (9.1%) were male. The results are comparable to the

contemporary study done by Narayanappa Shiroorkar Pradeepkumar, Reecha et al in an article titled emerging trends in thyroid diseases in tsunami hit coastal areas of Puducherry and Cuddalore, India. In their study total 342 cases of thyroid surgery during 2002 to 2009 were studied out of which 312 (91.23%) were female and only 30 (8.77%) cases were male.⁶ In an another study "Thyroid cancer and nodular goitre of thyroid: An analysis of patients in rural South Tamil Nadu" by Johnsy Merla, Shantaraman et al total 522 patients analysed, 91.57% were females and 8.43% were males.⁵

Total thyroidectomy is increasingly being accepted as a treatment of choice for even benign thyroid nodules, in view of recurrence of the same pathology in the remnant thyroid gland. However, in this study because of presumed increased morbidity associated with total thyroidectomy we did not considered total thyroidectomy a viable option for management of benign thyroid disorders. In majority of cases one lobe was involved and we did hemithyroidectomy (60% of the cases in this study). Multinodular goitres involving both the lobes of thyroid we considered for total thyroidectomy (34% of the cases in this study).

Fluid Collection After 48 Hours in Millilitres at Thyroid Bed	
Group 1	8, 2, 5, 1, 5, 3, 4, 1, 5, 1, 2, 4, 5, 2, 7, 5, 4, 2, 8, 12, 3, , 2, 1, 16, 4, 2, 14, 2, 0, 6, 4, 3, 3, 5, 16, 7, 5, 3, 2, 3, 4, , 3, 3, 14, 6, 4, 3, 3, 2, 1, 3, 4, 10, 2, 3, 6, 5, 22, 3, 2,
Group 2	2, 2, 3, 1, 5, 3, 0, 14, 5, 11, 0, 4, 5, 2, 7, 5, 4, 2, 8, 1, 3, , 2, 1, 6, 1, 2, 0, 4, 2, 6, 5, 13, 3, 5, 6, 7, 10, 3, 0, 3, 4, 3, 4, 4, 6, 1, 3, 3, 12, 1, 3, 4, 1, 2, 3, 6, 2, 3, 1, 5,

Table 2. Fluid Collection Measured by USG 48 Hours After Surgery in Group 1 and Group 2

Table 2 shows the amount of fluid collected at thyroid bed after 48 hours of surgery assessed by USG. The mean fluid collection in Group 1 is 4.83 ml and in Group 2 is 3.95 ml. The data is analysed using Students t test calculator to get the p-value. The p-value is .097983. The result is not significant at p <.01. This observation is in consistent with the observations in a study "Systematic review and meta-analysis of wound drains after thyroid surgery" by R. S. R. Woods 1, J. F. C. Woods et. al that there is No difference was found between the drain and no-drain groups in ultrasound assessed fluid volume on day 1 after operation, although the degree of heterogeneity was high.⁷

Amount of Fluid in Millilitres	Hemi Thyroidectomy	Total Thyroidectomy	Subtotal Thyroidectomy	Total Number of Cases
5 to 10 ml (Confined to tubing)	15	4	0	19
10 to 15 ml	8	5	0	13
15-20 ml	7	6	1	14
20-25 ml	0	7	1	8
25-30 ml	1	2	1	4
>30 ml	1	0	1	2

Table 3. The Amount of Fluid Collected in Drain in Group 2 After 48 Hours

Table 3 observes that in majority of cases the drain was less than 20 ml. 46 out of 60 cases the drain was less than 20 ml (76.6%). the drain was more in cases of total and subtotal thyroidectomy.

Parameter	Group 1	Group 2
Haematoma	2	1
Wound infection	3	1
Suture reaction	2	2
RLN injury-neurapraxia	3	2
Hypocalcaemia	8	6

Table 4. Post-Operative Complications

No significant differences observed between the two groups in relation to transient voice change, persistent recurrent laryngeal nerve palsy and wound infection, whether intervention was required or not.

The patients who developed small haematoma were diagnosed at the time of USG at 48 hours. None of the patients developed life threatening haemorrhage or respiratory compression after thyroidectomy in our study.

Small hematomas noted on ultra sound scan in 3 patients treated conservatively.

All the patients with transient postoperative RLN injury recovered normal vocal cord mobility within 3 months.

Although fourteen patients developed symptomatic hypocalcaemia, all are transient and responded well to the treatment with calcium gluconate and elemental calcium supplementation

The data is presented as the number of patients. A chi-square test was used for all of the complications. P value is presented for the total number of complications. The chi-square statistic is 0.6448. The p-value is .957953. The result is not significant at p <.01.

No. of Days in Hospital	Group 1	Group 2
2	35	18
3	12	17
4	8	21

5	3	1
6-10	2	3
Table 5. Distribution Study of Subjects Hospital Stay		

This data analysed using Chi square calculator. The chi-square statistic is 13.3425. The p-value is .009718. The result is significant at $p < .01$.

Though some patients can be discharged after 24 hours, we prolonged their hospital stay for 48 hours to get USG done to measure the collection at thyroid bed after 48 hours of thyroidectomy. Those patients not willing to stay for 48 hours were excluded from the study. The hospital stay was significantly more in group 2 patients those who were on drains.

Pain with Neck Movements	Group 1	Group 2	p Value
After 24 hours	4.58±1.13	5.45±1.22	0.0001
After 48 hours	2.52±1.03	4.34±1.17	<0.0001
Table 6. Postoperative Pain Score Using Visual Analogue Scale on 24 and 48 Hour After Surgery			

Postoperative pain was assessed according to a visual analogue scale (VAS) from 0 (no pain) to 10 (worst pain imaginable) at 24 hours and 48 hours after surgery. A standard analgesic protocol was used for all patients. Diclofenac sodium 75 mg given intramuscularly every 12 hours. Data were presented as mean ± SD; The pain in the post-operative period is significantly less in group 1 compared to group 2 (P value <0.0001)

DISCUSSION

Traditionally drains have been used in many surgical procedures including thyroid surgery to obliterate the dead space and evacuate collected blood and serum. Usual thinking is that the drains prevent the life-threatening complications like air way compression and obstruction caused by haemorrhage at thyroid bed. Actually, with the improvements in surgical equipment and surgical skills post-operative bleeding is quite rare and occurs only 0.3 to 1% of patients after thyroidectomy.⁸ No patient developed life threatening haemorrhage or respiratory compression after thyroidectomy in our study. Two patients in group 1 one in group 2 developed small hematoma not causing any pressure effects at the thyroid bed. It was diagnosed on ultra sound scan after 48 hours. This was treated conservatively.

The use of drains offers a false sense of security to the surgeon. A systematic review and meta-analysis was performed according to PRISMA guidelines by Woods RS et al concluded that drain use after routine thyroid surgery does not confer a benefit to patients. Furthermore, they showed and increased wound infection rate and postoperative pain and prolonged hospital length of stay (LOS) in patients with drain,⁷ and these conclusions are supported by a more recent meta-analysis.⁹

In our series in group 2 some cases do not have any fluid collection at thyroid bed but there was collection in the drain tubing. The presence of drain itself can cause tissue reaction and increase fluid collection. The action of negative suction of the drain may prevent the lymphatics from sealing off, which in turn results in an increase in seroma formation and drainage.¹⁰ In this series the yield in suction drain doesn't show much difference in relation to procedure done but those who have more than 20 ml yield continued with collection for more number of days. 3 patients in group 2 were in hospital for 9 days because of drain yield more than 20 ml per day.

8 out of 120 cases developed seroma 4 of them belong to group 1 and 5 of them belong to group 2. The seroma was noted in follow up visits at 15 days. On ultra sound examination seroma ranging from 6 ml to 14 ml was noted and aspirated under US guidance. All of them required aspiration more than once.

CONCLUSION

Routine placement of suction drains after thyroid surgery does not have any advantage. Placement of drains increases the hospital stay and post-operative discomfort to the patient. However suction drains may be considered in large goitres and extensive dissections. Drains should, therefore, be used selectively after thyroidectomy.

The present study concludes that routine insertion of drains after thyroidectomy is not necessary and can't substitute meticulous haemostasis, adequate anatomic display, and sound surgical judgment.

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Drains increase the hospital stay, operation time, and may be associated with an increased incidence of postoperative infective complications.

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