Complications Following Completion Thyroidectomy

Zahid Mehmood,[1*] Saad Abdul Razzak,[1] Muhammad Naseem Baloch,[1] Hammar Shahid,[1] Rabiya Khan Buledi,[1] Arsalna Javed [1]

ABSTRACT

Objective — *To evaluate the complications in completion thyroidectomy after unilateral thyroid lobectomy and isthmusectomy due to malignancy in histopathology report.*

Study design — *Descriptive cross sectional study.*

Place & Duration of study — *This study was conducted in Surgical ward 25, Jinnah Postgraduate Medical Centre Karachi, from January 2018 to December 2018.*

Methodology — *Fifty-seven patients who underwent completion thyroidectomy for the treatment of well differentiated thyroid cancer were included in this study. Patients with medullary, anaplastic and thyroid lymphoma were excluded. Serum calcium levels were monitored one day before the surgery and on 1st postoperative day. Written and informed consent was taken and data collected on pre-designed form.*

Results — *Recurrent laryngeal nerve (RLN) was identified and preserved in all cases. One (1.7%) patient developed transient hoarseness of voice, 4 (7.01%) had transient hypocalcemia, and 2 (3.5%) patients developed seroma. One (1.7%) patient was re-explored on the same postoperative day for neck hematoma which caused dyspnea and tachypnea. No patient developed wound infection. No patient developed permanent hypoparathyroidism / hypocalcemia at 3 months follow-up.*

Conclusion — *Completion thyroidectomy can be safely used as a mainstay of treatment for well differentiated thyroid malignancies.*

Key words — *Thyroidectomy, Thyroid carcinoma, Completion thyroidectomy.*

INTRODUCTION:

The most common endocrine tumour is thyroid carcinoma, accounting for around 92% of endocrine tumours. Papillary thyroid cancer (85%) is the most common type.[1] Most common presentation in thyroid clinic is with solitary thyroid nodule.[2] The usual evaluation is done by ultrasound neck and fine needle aspiration cytology. United Kingdom National Multidisciplinary Guidelines suggest unilateral thyroid lobectomy for thy-3 and thy-4 lesions.[3] However, the problem arises when histopathology of such thyroid tissues is reported as malignancy. Another issue is encountered when patients present with the history of lobectomy somewhere else and malignancy in histopathology found later. In cases where completion thyroidectomy is indicated, surgeons are usually hesitated due to the complications following completion thyroidectomy including hypocalcemia, recurrent laryngeal nerve injury and bleeding. These complications are mainly thought to be encountered due to adhesions and distorted anatomy after initial surgery. The aim of this study was to find the frequency of complications following completion thyroidectomy and the surgical steps taken to reduce these adverse outcomes.

[1] Department of Surgery Ward 25, Jinnah Postgraduate Medical Centre (JPMC) Karachi.

Correspondence:
Dr. Zahid Mehmood [1*]
Department of Surgery Ward 25,
Jinnah Postgraduate Medical Centre (JPMC)
Karachi
E mail: drzmpk@yahoo.com

METHODOLOGY:

This was a descriptive cross sectional study

conducted in Endocrine and General Surgical ward 25, Jinnah Postgraduate Medical centre Karachi, from January 2018 to December 2018. Fifty-seven patients with well differentiated thyroid cancer who underwent completion thyroidectomy as a second operation were included in the study. Patients with medullary, anaplastic or thyroid lymphoma were excluded. Initial surgery was performed due to solitary thyroid nodule with no evidence of malignancy preoperatively. Data was compared on the basis of age, gender and type of complications.

Apart from general investigations including thyroid profile and ultrasound neck, all patients who were referred from other hospitals for completion thyroidectomy had CT-scan neck and upper chest for identification of residual tissue on the ipsilateral side. Those patients who were initially operated already had CT-scan neck. They were followed with ultrasound neck along with preoperative investigations. All patients also underwent indirect laryngoscopy to document any previous vocal cord paralysis. Serum calcium were measured one day before the surgery, 24 hours after surgery and then 2 weeks postoperatively in clinic. Postoperative serum parathyroid hormone level was not measured routinely due to the lack of its availability.

A protocol was developed to check clinical signs and symptoms of hypocalcemia postoperatively every 6 hour and if positive, serum calcium levels were sent immediately and intravenous replacement with 10% calcium gluconate started. Along with IV replacement, oral supplementations of calcium and activated vitamin D also given.

Data was collected on a predesigned form. Statistical package for social sciences (SPSS) version 18.0 was used to analyze the data. The mean + standard deviation, median and range were calculated for numerical variables while frequency and percentages were computed for categorical variables.

RESULTS:

Total of 57 patients underwent completion thyroidectomy. There were 19 (33.3%) males and 38 (66.6%) females. Male to female ratio was 1:2. The age varied from 12 to 75 year. Out of total patients, 49 (85.96%) had papillary cancer, 5 (8.77%) follicular cancer, and 3 (5.26%) patients had Hurthle cell carcinoma. Twenty nine (50.87%) patients showed malignancy in contralateral lobe. Eight (27.58%) patients were male and 21 (72.413%) female. Regarding malignancy in contralateral lobe, papillary and Hurthle cell carcinoma were noted in 26 (53.061%) and 2 (66.66%) patients respectively.

Preoperative hoarseness of voice was identified in 6 (10.5%) patients. In second operation, recurrent laryngeal nerve was identified and preserved in all cases. However, 1 (1.7%) patient developed transient hoarseness of voice, which was found to be significantly improved on follow up after 3 months. Mean preoperative and postoperative calcium level were 8.6+-0.5 mg/dl and 8.9+-0.5 mg/dl respectively. Furthermore, transient hypocalcemia was noted in 4 (7.01%) patients. No patient with permanent hypoparathyroidism / hypocalcemia found at 3 months follow up. None of the patients required prolonged calcium and vitamin D supplementation. All 4 patients who developed transient hypocalcemia, were female and belonged to a younger age group with an average age of 20 year, raising a possibility of dietary insufficiency of vitamin D and calcium. Only 1(1.7%) patient was re-explored on same postoperative day for tension hematoma in neck causing respiratory discomfort. Two (3.5%) patients among these developed seroma. No patient developed wound infection (Table I).

DISCUSSION:

Completion thyroidectomy is defined as removal of residual thyroid tissue either unilateral or bilateral after initial thyroid surgery, either lobectomy, subtotal thyroidectomy or near total thyroidectomy due to malignancy in histopathology report. Removal of complete thyroid gland has several advantages. Firstly, it facilitates the detection and ablation of recurrent and metastatic disease with radioactive iodine.[4] Secondly, thyroglobulin levels can be used as an important indicator of recurrent or metastatic disease when nearly all normal thyroid tissues have been removed. Lastly, it reduces the small risk of transformation of well differentiated thyroid

Table I: Complications Following Completion Thyroidectomy

Complications	Frequency n (%)
Transient Hypocalcemia	4 (7.01%)
Transient Hoarseness of Voice	1 (1.7%)
Seroma	2 (3.5%)
Hematoma	1 (1.7%)

carcinoma into anaplastic carcinoma. However, the morbidity associated with completion thyroidectomy is also an important consideration. These includes transient and permanent hypocalcaemia, RLN injury, seroma, bleeding, and surgical site infection. A study done earlier has concluded that there was no significant difference in surgical outcome and risk of complication between early (within 10 days) completion versus late (after 3 months) completion thyroidectomy.[5] However, recent systemic review and meta-analysis has favoured delayed completion thyroidectomy due to low risk of complications.[6]

Hypocalcaemia is the most common complication following total thyroidectomy.[7] A study has shown that incidence of transient hypoparathyroidism is around 24.5%, followed by permanent and symptomatic hypocalcemia in 16.67% patients after completion thyroidectomy.[2] A diminishing trend was noted in other studies where these are reported as 20% and 5.8% respectively.[8] Similar trend was also noted in a recent study from Korea that reported 9.4% and 3.1% frequency of transient and permanent hypoparathyroidism respectively.[9] Our study had similar results as transient hypocalcemia following completion thyroidectomy occurred in 7.01% and no patient developed permanent hypocalcaemia.

Relation of hypocalcaemia with age and gender was not discussed in past, however in this study we have found a strange relation that hypocalcaemia was more common in females of younger age group, probably due to poor diet and decrease consumption of vitamin D and calcium. This area of study still needs to be discussed further.

The rate of RLN injury following thyroid surgery was estimated to 0.5 – 5%.[10] The risk of damage to RLN is more important in redo surgeries. However, meticulous dissection, use of surgical loupes and following appropriate surgical steps can lower this risk.[2] In this study RLN injury did not occur. In a study by Gangiti in 2016 where surgeries were performed using loupes, no RLN damage is reported.[2] During this study, experienced surgeons performed all completion thyroidectomies without using loupes or nerve monitoring device and only one patient developed transient hoarseness of voice which was also found to be significantly improved on 6 months' follow-up.

The incidence of seroma after thyroid surgeries reported in literature as 1.7% to 7%.[11,12] Seroma formation is associated with wound infection, flap necrosis and regional swelling, which may result in longer hospital stay.[12] The study demonstrated 2.2% incidence of seroma after thyroid surgeries.[11] Increased frequency of seroma formation was noted in our study, probably due to the usage of conventional clamp and tie technique and ligasure.

Regarding wound infection after thyroidectomy, it is a rare but significant complication. The incidence was found to be very low, with figures of 0.36% and 0.4%.[13,14] Although, completion thyroidectomy is a clean surgery, but prophylactic antibiotics were given in all cases in our study. No wound infection was noted in this study but relation with the use of prophylactic antibiotics cannot be properly established and its role remains controversial.[15]

CONCLUSIONS:

Completion thyroidectomy is safe and effective procedure for well differentiated thyroid carcinoma in experienced hands. None of the patients developed permanent hypocalcaemia and a patient with RLN injury also showed improvement in follow up. Females of younger age group should be properly evaluated preoperatively for vitamin D and calcium levels and if deficient should be corrected before surgery to further reduce the risk of transient hypocalcaemia.

REFERENCES:

1. Karkuzhali P, Yogambal M, Kumar M. An Indian tertiary care hospital scenario of papillary carcinoma of thyroid. J Clin Diagn Res. 2017;11:EC26–EC9.
2. Kranthikumar G, Syed N, Nemade H, Pawar S, Chandra Sekhara Rao LM, Subramanyeshwar Rao T. Safety of completion thyroidectomy for initially misdiagnosed thyroid carcinoma. Rambam Maimonides Med J. 2016;7: e0022.
3. Mitchell AL, Gandhi A, Scott-Coombes D, Perros P. Management of thyroid cancer: United Kingdom National Multidisciplinary Guidelines. J laryngol Otol. 2016;130:S150-S60.
4. Kluijfhout WP, Rotstein LE, Pasternak JD. Well-differentiated thyroid cancer: Thyroidectomy or lobectomy? Canadian Med Assoc J. 2016;188:E517-E20.
5. Baloch N, Aslam T, Maher M. Completion thyroidectomy: relation to timing with complications. Pakistan J Surg. 2007;23: 245-7.

6. Saleem RB, Saleem MB, Saleem NB. Impact of completion thyroidectomy timing on post-operative complications: a systematic review and meta-analysis. Gland Surg. 2018;7:458-65.

7. Cmilansky P, Mrozova L. Hypocalcemia - the most common complication after total thyroidectomy. Bratisl Lek Listy. 2014;115:175-8.

8. Gulcelik MA, Dogan L, Akgul GG, Guven EH, Ersoz Gulcelik N. Completion thyroidectomy: Safer than thought. Oncol Res Treatment. 2018;41:386-90. doi: 10.1159/000487083.

9. Park YM, Kim JR, Oh KH, Cho JG, Baek SK, Kwon SY, et al. Comparison of functional outcomes after total thyroidectomy and completion thyroidectomy: Hypoparathyroidism and postoperative complications. Auris Nasus Larynx 2019;46:101-5 doi: 10.1016/j.anl. 2018.03.009.

10. Tresallet C, Chigot JP, Menegaux F. [How to prevent recurrent nerve palsy during thyroid surgery?]. Ann Chir. 2006;131:149-53.

11. Ramouz A, Rasihashemi SZ, Daghigh F, Faraji E, Rouhani S. Predisposing factors for seroma formation in patients undergoing thyroidectomy: Cross-sectional study. Ann Med Surg. 2017;23:8-12.

12. Sheahan P, O'Connor A, Murphy MS. Comparison of incidence of postoperative seroma between flapless and conventional techniques for thyroidectomy: a case-control study. Clin Otolaryngol. 2012;37:130-5.

13. Elfenbein DM, Schneider DF, Chen H, Sippel RS. Surgical site infection after thyroidectomy: a rare but significant complication. J Surg Res. 2014;190:170-6.

14. Myssiorek D, Ahmed Y, Parsikia A, Castaldi M, McNelis J. Factors predictive of the development of surgical site infection in thyroidectomy - An analysis of NSQIP database. Int J Surg. 2018;60:273-8.

15. Fachinetti A, Chiappa C, Arlant V, HY, X, H, et al. Antibiotic prophylaxis in thyroid surgery. 2017;6:525–9. doi:10.21037/gs.2017.07.02

Received for publication: 19-07-2019

Accepted after revision: 11-08-2019

Author's Contributions:
Zahid Mehmood: Study design, Manuscript writing, Data analysis.
Saad Abdul Razzak: Manuscript writing, Data collection and Literature search.
Muhammad Naseem Baloch: Final Approval of Manuscript.
Hammar Shahid: Data collection & Literature search.
Rabbia Khan Buledi: Data collection & Literature search.
Arsalna Javed: Data collection & Literature search.

Conflict of Interest:
The authors declare that they have no conflict of interest.

Source of Funding:
None

How to cite this article:
Mehmood Z, Razzak SA, Baloch MN, Shahid H, Buledi RK, Javed A. Complications following completion thyroidectomy. J Surg Pakistan. 2019;24(2):67-70. Doi:10.21699/jsp.24.2.4.