

Completion thyroidectomy in differentiated thyroid cancer: When to perform?

Abdullah Kısaoğlu, Bünyami Özoğul, Müfide Nuran Akçay, Gürkan Öztürk, Sabri Selçuk Atamanalp, Bülent Aydınli, Salih Kara

ABSTRACT

Objective: Completion thyroidectomy is recommended in patients who have been diagnosed with differentiated thyroid cancer on histopathological evaluation, if their first operation was a conservative approach. The critical issue is when to do the second operation.

Material and Methods: The medical records of 66 patients who underwent completion thyroidectomy for the treatment of differentiated thyroid cancer in our clinic between 2006-2013 were retrospectively analyzed. All data were compared after patients were divided into two groups according to the interval between the first surgery and completion thyroidectomy.

Results: Fifty-two patients (78.8%) were women and 14 patients (21.2%) were male. Completion thyroidectomy was performed 10-90 days after the initial surgery (group 1) in 26 patients, whereas it was performed later than 90 days in 40 patients (group 2). Temporary hypoparathyroidism occurred in two patients (7.7%) in group 1, and in 3 patients (7.5%) in group 2. Transient recurrent laryngeal nerve palsy was observed in 1 patient (3.9%) in group 1, and in 1 patient (2.5%) in group 2. There were no permanent morbidities in both groups. Residual tumor rate after completion thyroidectomy was 45.5%. There was no statistically significant difference between the two groups in terms of complications after completion thyroidectomy.

Conclusion: Although in some studies it is recommended that completion thyroidectomy should be performed either before scar tissue development or after clinical remission of scar tissue, edema and inflammation, we believe that timing of surgery has no effect on morbidity.

Key Words: Thyroid cancer, thyroidectomy, intraoperative complication, repeat surgery

INTRODUCTION

Although the type of surgery in the treatment of differentiated thyroid cancer (DTC) is still being debated, in recent years many authors recommend total thyroidectomy in these patients with good prognosis due to the metastasis potential, even though it is rare (1, 2). Udelsman and Shaha (3) advocate total thyroidectomy stating that with limited surgery the risk of recurrence, reoperation and morbidity increase and that radioactive iodine (RAI) ablation occurs at lower doses. In contrast, some authors suggest conservative approaches based on the findings that risk of anaplastic transformation is below 1%, multicentric tumors do not significantly affect the clinical course, and in limited surgery; RAI therapy is possible with lower morbidity, the prognosis does not change and the complication rate is lower (4, 5). Similarly, although what needs to be done in patients pathologically diagnosed with DTC and in whom a conservative approach had been preferred during the first surgery is still controversial, a completion thyroidectomy is often suggested in high-risk patients in order not to leave any thyroid tissue behind (6, 7). The critical point is the timing of the second operation.

In our study, we retrospectively evaluated patients who underwent completion thyroidectomy for DTC with emphasis on the importance of timing of the reoperation.

MATERIAL AND METHODS

The medical records of 66 patients who underwent completion thyroidectomy for the treatment of DTC in Atatürk University Medical Faculty Hospital, General Surgery Clinics between January 2006 to September 2013 were retrospectively analyzed, after approval of the study by Atatürk University Faculty of Medicine Clinical Research Ethics Board. Informed consent was obtained from all patients included in the study. Patients were divided into two groups according to the interval after initial surgery, patients who had their completion thyroidectomy in the 10-90 day period constituted group 1, and those who underwent reoperation after the 90th day were included in group 2. Performing completion thyroidectomy in the first 10 days or after the 90th days after the initial operation, when tissue inflammation and fibrosis are at their minimum levels, is important due to the lower risk of complications. Nevertheless,

Department of General Surgery,
Atatürk University Faculty of
Medicine, Erzurum, Turkey

Address for Correspondence Dr. Abdullah Kısaoğlu

Department of General Surgery,
Atatürk University
Faculty of Medicine,
Erzurum, Turkey
Phone: +90 442 231 75 66
e-mail:
kisaoglu.a@gmail.com

Received: 12.03.2013
Accepted: 09.12.2013

©Copyright 2014
by Turkish Surgical Association
Available online at
www.ulusalcerahidergisi.org

majority of our patients had their first surgeries in other centers and were referred to our center in the late period and a small number of patients who had their first surgeries in our clinic presented late, in this study none of the completion thyroidectomies were done within the first 10 days. However, when grouping patients the first 10 days were taken into consideration.

Patients treated with options other than total thyroidectomy for benign reasons and diagnosed with DTC in the postoperative histopathological examination were included in the study if there was capsular and vascular invasion, if the tumor diameter was greater than 1 cm and if the tumor was multicentric. Patients who had hypoparathyroidism and recurrent laryngeal nerve paralysis (RLNP) after the first surgery were not included in the study. All patients were evaluated with thyroid ultrasonography and scintigraphy in terms of location and size of residual thyroid tissue before completion thyroidectomy. If in the first operation unilateral lobectomy had been performed, only contralateral lobectomy was done. Central neck dissection was made in patients with central lymph node involvement in preoperative evaluation. Prior to reoperation, each patient's thyroid function tests were evaluated, to verify euthyroidism.

Patients age, sex, type of first operation, first histopathological diagnosis, duration of completion thyroidectomy procedure, the presence of tumor in the resected tissue, and complications were compared between the two groups. In the postoperative period, diagnosis of RLNP was done with indirect laryngoscopy examination. The other major postoperative complication of hypoparathyroidism was classified as temporary or permanent. Calcium (Ca) level below 8 mg/dL was considered as hypoparathyroidism, and patients were started on oral and intravenous Ca replacement. Patients were followed up for 6 months after completion thyroidectomy, in terms of hypoparathyroidism and RLSP. Improvement of complications within 6 months was considered as temporary, while persistence beyond 6 months was considered as permanent.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) 20 software package program was used for analysis, and the data were evaluated by chi-square test and Fisher's exact chi-square test. P value of <0.05 was considered statistically significant.

RESULTS

Fifty-two of the patients (78.8%) were female and 14 (21.2%) were male, with a mean age of 36.4 (24-70) years. Sixty patients (90.9%) had their first operation in other centers. The first histopathologic diagnosis was papillary cancer in 55 patients (83.3%), and follicular cancer in 11 patients (16.7%). Twenty-six patients underwent completion thyroidectomy in 10 to 90 days after the initial surgery (group 1), whereas 40 patients had the second operation later than 90 days (group 2). Enlarged cervical lymph nodes were detected in 3 patients in the tests performed before reoperation, and they were evaluated during the operation by frozen section. It was found that 2 of these patients had metastatic disease

and they underwent modified radical neck dissection. Temporary hypoparathyroidism was detected in 2 patients (7.7%) in group 1 and in 3 patients (7.5%) in group 2. Temporary RLNP occurred in 1 patient in group 1 (3.9%), and in 1 patient in group 2 (2.5%). In both groups, neither permanent hypoparathyroidism nor permanent RLNP developed. Among 7 patients with complications, residual thyroid tissue was bilateral in 4, and was unilateral in the remaining 3 patients. Furthermore, central neck dissection was performed in 3 of these 7 patients. Residual tumor was found in histopathological evaluation after completion thyroidectomy in 45.5% (n=30) of patients. Data on patients who underwent completion thyroidectomy is outlined in Table 1.

The comparison between groups in terms of age ($p=0.67$), gender ($p=0.50$), the type of first operation ($p=0.49$) and the first histopathologic diagnosis ($p=0.37$) did not show a difference. In addition, there was no statistically significant difference in terms of reoperation duration ($p=0.57$), histopathological diagnosis ($p=0.60$), temporary hypoparathyroidism ($p=0.66$) and transient RLNP ($p=0.64$) between the groups.

DISCUSSION

The surgical removal of the contralateral lobe with a second operation in patients who have undergone a lobectomy during the first operation that revealed thyroid malignancy, is called completion thyroidectomy. It is reported that differentiated thyroid cancer may be detected in up to 10% of patients undergoing surgical procedures for benign thyroid disease, in post-operative histopathological evaluation (8, 9). In the literature, completion thyroidectomy is recommended for such cases (10, 11).

Local lymph node metastasis and multifocal tumor location are common in papillary thyroid cancer. In a study, histopathological examination of completion thyroidectomy revealed multifocality in papillary thyroid cancer as 41.2%, presence of tumor in the contra-lateral lobe as 37.5% (12). In addition, it is reported that presence of multifocal tumor is associated with a high risk of lymph node metastasis (13). In another study, multicentricity was reported as 30%, and presence of tumor in the contra-lateral lobe as 22.5% for papillary thyroid cancer, and in follicular thyroid cancer multicentricity was 30.7% and presence of tumor in the contralateral lobe was 19.2% (14). On the other hand, if histopathological diagnosis after the initial surgery is reported as minimally invasive follicular cancer, the presence of capsular or vascular invasion is particularly important. In the presence of vascular invasion, there is a high risk of recurrence and metastasis (15). Distant metastases are reported in 10% of patients with minimally invasive follicular cancer and 50% of follicular cancer patients have been reported to be invasive. As a result, completion thyroidectomy is recommended in all patients with papillary thyroid cancer except those with unifocal papillary microcarcinoma smaller than 1 cm without thyroid capsule infiltration and/or metastasis, and all patients with follicular thyroid cancer (10, 11). In our clinic, considering these features, we apply completion thyroidectomy in patients with an unexpected histopathological diagnosis of DTC.

Table 1. Properties of patients undergoing total thyroidectomy			
	Group 1 (n=26) n (%)	Group 2 (n=40) n (%)	
Age (year)	35.2 (25-67)	37.3 (24-70)	p=0.67
Gender			p=0.50
Female	20 (77%)	32 (80%)	
Male	6 (23%)	8 (20%)	
First operation			p=0.49
Bilateral subtotal T.	8 (30.8%)	16 (40%)	
Near total T.	12 (46.1%)	19 (47.5%)	
Unilateral lobectomy	6 (23.1%)	5 (12.5%)	
First histopathology			p=0.37
Papillary cancer	23 (88.5%)	32 (80%)	
Follicular cancer	3 (11.5%)	8 (20%)	
Re-operation duration (min)	96 (75-138)	103 (72-147)	p=0.57
Histopathology after TT			p=0.60
Papillary cancer	12 (46.1%)	14 (35%)	
Follicular cancer	1 (3.9%)	3 (7.5%)	
Benign	13 (50%)	23 (57.5%)	
Transient hypoparathyroidism	2 (7.7%)	3 (7.5%)	p=0.66
Permanent hypoparathyroidism	0	0	
Transient RLNP	1 (3.9%)	1 (2.5%)	p=0.64
Permanent RLNP	0	0	
Length of stay (days)	2.6 (2-6)	3.0 (2-7)	

T: thyroidectomy; TT: total thyroidectomy; RLNP: recurrent laryngeal nerve paralysis

There is no agreement regarding timing of reoperation for completion thyroidectomy, after considering issues of tissue inflammation, edema, adhesions, and scar tissue development after the first operation, the consequent inevitable bleeding, and complications occurring during second surgery due to loss of landmarks. Some old studies conducted on this subject report that reoperation should be done in the first 10 days or after 90 days (12, 16). But some later studies state that timing of second surgery does not have an effect on complications (17-19). In our study, similarly the timing of reoperation has not been found to have a statistically significant effect on operation duration or other complications.

Although positive effect of completion thyroidectomy on survival cannot be fully revealed, multifocal nature of the tumor mandates completion thyroidectomy (14). It has been reported that in patients who underwent surgical treatment less than total thyroidectomy for benign reasons, and histopathological diagnosis is DTC, if completion thyroidectomy is not performed tumor would have been left behind in a significant proportion of patients and residual tumor will be observed in 22-64% of such patients (20). Several other studies also report similar results (21, 22). In our study, parallel to the literature, the rate of residual tumor found in the remaining tissue after

reoperation was 45.5% (n=30). The finding that in almost half of the patients tumor was detected in the residual thyroid tissue with completion thyroidectomy indicates that total thyroidectomy should be performed in benign thyroid diseases.

As in primary thyroid surgery, RLNP and hypoparathyroidism are the most common and most feared complications in completion thyroidectomy. In patients undergoing completion thyroidectomy, permanent hypoparathyroidism rate is reported as 3%, temporary hypoparathyroidism as 0-15% and permanent RLNP as 2-5% (19). Walgenbach and Junginger (23) reported that postoperative morbidity would be less if completion thyroidectomy is performed in the first week or after the first 3 months after the first surgery. In contrast, studies are also available stating that the postoperative complication rate is independent of the time between two operations, that the rate of permanent RLNP rate is 1.6-2.7%, and the rate of permanent hypoparathyroidism is 0.9-4.8% after completion thyroidectomy (17, 24). Rafferty et al. (25) reported temporary RLNP rate as 2%, permanent RLNP as 0.5%, temporary hypoparathyroidism rate as 7% and permanent hypoparathyroidism rate as 2.5% after completion thyroidectomy. Our complication rates are comparable to results reported in the literature, the total morbidity rate was found as 10.6%, temporary RLNP rate as 3.0% and temporary hypoparathyroidism rate as 7.6%.

Study Limitations

During the study period, completion thyroidectomy was not performed within the first 10 days after the initial surgery in any patients and a related group could not be established. Therefore, results of completion thyroidectomy within this period could not be examined. Furthermore, our study is a retrospective study. Although in our study, the timing of completion thyroidectomy had no effect on morbidity, large-scale, prospective studies are required.

CONCLUSION

Completion thyroidectomy of patients initially treated with conservative surgery for benign reasons but were diagnosed with DTC after histopathologic evaluation, should be performed in experienced centers. The high rate of tumor detection in the residual thyroid tissue, suggests that total thyroidectomy should be done in benign thyroid diseases. Although different opinions are advocated regarding when to perform completion thyroidectomy, we think timing of completion thyroidectomy does not have an effect on morbidity.

Ethics Committee Approval: Ethics committee approval was received for this study from Clinical research ethics committee of Faculty of Medicine, Ataturk University.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - A.K., B.Ö., S.S.A.; Design - A.K., B.Ö., M.N.A.; Supervision - M.N.A., G.Ö.; Funding - A.K.,

B.Ö., G.Ö.; Materials - S.S.A., B.A., S.K.; Data Collection and/or Processing - B.A., G.Ö., S.K.; Analysis and/or Interpretation - A.K., S.S.A., M.N.A., B.A., B.Ö.; Literature Review - M.N.A., B.A., S.K.; Writer - A.K., S.K.; Critical Review - M.N.A., B.A., G.Ö.; Other - B.A., B.Ö., S.K.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

- Mittendorf EA, McHenry CR. Thyroidectomy for selected patients with thyrotoxicosis. *Arch Otolaryngol Head Neck Surg* 2001; 127: 61-65. [\[CrossRef\]](#)
- Mishra A, Agarwal A, Agarwal G, Mishra SK. Total thyroidectomy for benign thyroid disorders in an endemic region. *World J Surg* 2001; 25: 307-310. [\[CrossRef\]](#)
- Udelsman R, Shaha AR. Is total thyroidectomy the best possible surgical management for well-differentiated thyroid cancer? *Lancet Oncol* 2005; 6: 529-531. [\[CrossRef\]](#)
- Gimm O. Thyroid cancer. *Cancer Lett* 2001; 163: 143-156. [\[CrossRef\]](#)
- Shaha AR. Thyroid cancer: extent of thyroidectomy. *Cancer Control* 2000; 7: 240-245.
- Mazzaferrri EL. An overview of the management of papillary and follicular thyroid carcinoma. *Thyroid* 1999; 9: 421-427. [\[CrossRef\]](#)
- Akcan A, Sözüer E, Akyıldız H, Akgün H, Küçük C, Ok E, et al. Completion thyroidectomy in well-differentiated thyroid cancers-Retrospective clinical study. *Ulusal Cer Derg* 2008; 24: 83-88.
- Agarwal G, Aggarwal V. Is total thyroidectomy the surgical procedure of choice for benign multinodular goiter? An evidence-based review. *World J Surg* 2008; 32: 1313-1324. [\[CrossRef\]](#)
- Clark OH, Levin K, Zeng QH, Greenspan FS, Siperstein A. Thyroid cancer: the case for total thyroidectomy. *Eur J Cancer Clin Oncol* 1988; 24: 305-313. [\[CrossRef\]](#)
- Dralle H. Maligne Schilddrüesentumoren. In: Krebsgesellschaft D (ed). *Kurzgefasste interdisziplinäre Leitlinien* 2008. Zuckerschwerdt Verlag, Munich, Germany. 2008.
- Cooper DS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* 2009; 19: 1167-1214. [\[CrossRef\]](#)
- Auguste LJ, Attie JN. Completion thyroidectomy for initially misdiagnosed thyroid cancer. *Otolaryngol Clin North Am* 1990; 23: 429-439.
- Chow SM, Law SC, Chan JK, Au SK, Yau S, Lau WH. Papillary microcarcinoma of the thyroid-prognostic significance of lymph node metastasis and multifocality. *Cancer* 2003; 98: 31-40. [\[CrossRef\]](#)
- Rosário PW, Fagundes TA, Borges MA, Padrão EL, Rezende LL, Barroso AL, et al. Completion thyroidectomy in patients with thyroid carcinoma initially submitted to lobectomy. *Clin Endocrinol* 2004; 61: 652-653. [\[CrossRef\]](#)
- Delbridge L, Parkyn R, Philips J, Barraclough B, Robinson B. Minimally invasive follicular thyroid carcinoma: completion thyroidectomy or not? *ANZ J Surg* 2002; 72: 844-845. [\[CrossRef\]](#)
- Davies L, Welch HG. Surgery of thyroid cancer. In: Lynn J, Bloom SR, eds. *Surgical Endocrinology*. Oxford: Butterworth Heinemann, 1993: 240-257. [\[CrossRef\]](#)
- Lefevre JH, Tresallet C, Leenhardt L, Jublanc C, Chigot JP, Mengeaux F. Reoperative surgery for thyroid disease. *Langenbecks Arch Surg* 2007; 392: 685-691. [\[CrossRef\]](#)
- Tan MP, Agarwal G, Reeve TS, Barraclough BH, Delbridge LW. Impact of timing on completion thyroidectomy for thyroid cancer. *Br J Surg* 2002; 89: 802-804. [\[CrossRef\]](#)
- Kepenekçi İ, Demirel S, Koçak S, Tuğ T, Aliç B, Baskan S. Timing of the reoperation in completion thyroidectomy. *Türkiye Klinikleri J Med Sci* 2009; 29: 1212-1216.
- Erdem E, Gülçelik MA, Kuru B, Alagöl H. Comparison of completion thyroidectomy and primary surgery for differentiated thyroid carcinoma. *Eur J Surg Oncol* 2003; 29: 747-749. [\[CrossRef\]](#)
- Kupferman ME, Mandel SJ, Di Donato L, Wolf P, Weber RS. Safety of completion thyroidectomy following unilateral lobectomy for well-differentiated thyroid cancer. *Laryngoscope* 2002; 112: 1209-1212. [\[CrossRef\]](#)
- Dewil B, Van Damme B, Vander Poorten V, Delaere P, Debruyne F. Completion thyroidectomy after the unexpected diagnosis of thyroid cancer. *B-ENT* 2005; 1: 67-72.
- Walgenbach S, Junginger T. Is the timing of completion thyroidectomy for differentiated thyroid carcinoma prognostic significant? *Zentralbl Chir* 2002; 127: 435-438. [\[CrossRef\]](#)
- Makay O, Unalp O, Icoz G, Akyıldız M, Yetkin E. Completion thyroidectomy for thyroid cancer. *Acta Chir Belg* 2006; 106: 528-531.
- Rafferty MA, Goldstein DP, Rotstein L, Asa SL, Panzarella T, Gullane P, et al. Completion thyroidectomy versus total thyroidectomy: is there a difference in complication rates? An analysis of 350 patients. *J Am Coll Surg* 2007; 205: 602-607. [\[CrossRef\]](#)