Timing of the Reoperation in Completion Thyroidectomy

Tamamlayıcı Tiroidektomide Reoperasyonun Zamanlaması

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ABSTRACT Objective: In differentiated thyroid cancer, for patients who had undergone an operation other than total thyroidectomy, completion thyroidectomy is often advocated, with an outcome equivalent to that of total thyroidectomy. Morbidity of completion thyroidectomy is higher than that of primary surgery. Completion surgery was suggested to be undertaken either within 10 days of the primary operation or after 90 days to avoid adhesions and distorted anatomy. In this study, we aimed to evaluate the impact of the timing of completion thyroidectomy on morbidity of the operation. This study was designed as a retrospective review of a single institution experience. **Material and Methods:** From March 2000 to November 2006, 241 consecutive patients who underwent completion thyroidectomy for treatment of differentiated thyroid carcinoma were divided into two groups based on the time interval between the initial surgery and completion thyroidectomy. The rates of recurrent laryngeal nerve palsy and hypoparathyroidism were evaluated. **Results:** One hundred and twenty-eight patients underwent completion thyroidectomy 90 days after the initial operation (group I) and 113 patients had the second operation within 10-90 days of the initial operation (group II). Rate of transient hypoparathyroidism was 7.8% in group I and 8% in group II. Hypoparathyroidism was permanent in 1.6% of the patients in group I. No patients had permanent hypoparathyroidism in group II. Transient recurrent laryngeal nerve palsy occurred in 0.8% of the patients in group I and in 1.8% of those in group II. Permanent nerve palsy occurred in 0.8% of the patients in group I and in no patient in group II. There was no statistically significant difference between the two groups regarding the incidence of complications. **Conclusion:** Results of this study suggest that completion thyroidectomy for treatment of differentiated thyroid carcinoma can be performed anytime after the initial surgery and timing of the reoperation does not have an impact on morbidity of the operation.

Key Words: Reoperation; thyroidectomy; vocal cord paralysis; hypoparathyroidism

ÖZET Amaç: Diferansiye tiroid kanseri nedeni ile total tiroidektomi dışında bir ameliyat uygulanan hastalarda, tamamlayıcı tiroidektomi sıklıkla savunulmakta ve total tiroidektomiye benzer sonuç sağlamaktadır. Tiroid reoperasyonlarının morbiditesi primer cerrahide olduğundan daha yüksektir. Tiroid reoperasyonlarının, yapışıklıklardan ve anatomik bozukluktan kaçınmak için, ilk ameliyattan sonraki 10 gün içinde veya 90 gün sonra yapılması önerilmektedir. Bu çalışmanın amacı, tamamlayıcı tiroidektomide zamanlamanın, ameliyatın morbiditesi üzerindeki etkisini araştırmaktır. Çalışma, tek merkeze ait verilerin retrospektif değerlendirmesi şeklinde düzenlenmiştir. **Gereç ve Yöntemler:** Mart 2000-Kasım 2006 tarihleri arasında diferansiye tiroid kanserinin tedavisi için tamamlayıcı tiroidektomi uygulanan 241 hasta, ilk ameliyat ve tamamlayıcı tiroidektomi arasındaki süreye göre iki gruba ayrıldı. Yineleyen laringeal sinir hasarı ve hipoparatiroidizm oranları değerlendirildi. **Bulgular:** Yüz yirmi sekiz hastada tamamlayıcı tiroidektomi ilk ameliyattan 90 gün sonra, 113 hastada ise ilk ameliyattan sonraki 10-90 gün içinde uygulanmıştı. Geçici hipoparatiroidizm sıklığı grup I'de %7.8, grup II'de %8 idi. Grup I'deki hastaların %1.6'sında hipoparatiroidizm kalıcı oldu. Grup II'de hiç bir hastada kalıcı hipoparatiroidizm gelişmedi. Geçici yineleyen laringeal sinir hasarı grup I'deki hastaların %0.8'inde, grup II deki hastaların %1.8'inde gelişti. Grup I'de hastaların %0.8'inde kalıcı yineleyen laringeal sinir hasarı gelişti; grup II'de hiçbir hastada kalıcı yineleyen laringeal sinir hasarı olmadı. Komplikasyonlar açısından her iki grup arasında istatistiksel olarak anlamlı fark bulunmadı. **Sonuç:** Bu çalışmanın sonuçları, diferansiye olmuş tiroid kanserlerinin tedavisinde tamamlayıcı tiroidektominin ilk ameliyattan sonraki herhangi bir zamanda yapılabileceğini ve reoperasyonun zamanlamasının ameliyatın morbiditesi üzerinde etkisi olmadığını düşündürmektedir.

Anahtar Kelimeler: Reoperasyon; tiroidektomi; vokal kord paralizisi; hipoparatiroidizm

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The extent of surgery in well-differentiated thyroid carcinomas has been a controversial issue; however, total thyroidectomy is considered the ideal treatment.[1-5] The best operative approach is to treat the patient with a single operation but a definitive diagnosis of carcinoma cannot always be made before surgery. Both preoperative fine needle cytology and intraoperative frozen section have some limitations and definitive diagnosis can be made only after permanent histological sections are reviewed.[6-10] Completion thyroidectomy is often advocated for patients who are treated with partial thyroidectomy and the final diagnosis of cancer is confirmed on permanent sections.[11-14]

Completion surgery is perhaps the most challenging of the thyroid operations. The morbidity rates are higher than for primary surgery and include a reported 2-5% risk of recurrent laryngeal nerve injury and 8-15% incidence of hypoparathyroidism.[12,15,16] Completion thyroidectomy is thought to be even more difficult and hazardous when performed within 10 to 90 days of the previous operation.[17,18] Dense adhesions due to the inflammatory reaction in the operative field and distorted anatomy make completion thyroidectomy a completely different operation from primary thyroidectomy.[19] Reoperative thyroid surgery was suggested to be undertaken either within 10 days of the prior operation or after 90 days when inflammatory reaction and adhesions are minimal.[17,19-21]

The purpose of the present study was to evaluate the impact of the timing of completion thyroidectomy on morbidity of the operation.

MATERIAL AND METHODS

PATIENT SELECTION

The records of 241 consecutive patients who had undergone completion thyroidectomy in our Endocrine Surgery Unit between March 2000 and November 2006 were reviewed retrospectively. All patients had been initially operated in another institution and had been referred to our unit for further management. The initial operation was subtotal thyroidectomy in all cases. Patients who had previously undergone a near-total thyroidectomy or unilateral lobectomy were not included in the study. Patients with recurrent malignancy were also excluded to form a uniform group, as well as individuals with vocal cord paralysis or hypoparathyroidism as a complication of the initial procedure. We divided the patients into two groups based on the time interval between the initial operation and completion thyroidectomy.

OPERATIVE TECHNIQUE

All the operative procedures were carried out by or under direct supervision of an experienced senior surgeon. Completion thyroidectomy was performed through the previous incision. Superior and inferior flaps were raised in subplatysmal plane. A midline or lateral approach was performed to expose the thyroid remnant. Careful dissection was carried out, and external and recurrent laryngeal nerves, as well as the parathyroid glands were identified and preserved. If the vascular supply of a parathyroid gland was compromised, it was implanted into the ipsilateral sternocleidomastoid muscle. In patients with lymph nodes in pathologic range diagnosed by preoperative imaging or clinical lymph node metastases, a lateral cervical lymph node dissection was performed. Intraoperative nerve monitoring was not used during the operations of any of the patients in this series.

POSTOPERATIVE COURSE AND COMPLICATIONS

Postoperative complications specific to thyroidectomy were reviewed including recurrent laryngeal nerve palsy and hypoparathyroidism. Recurrent laryngeal nerve palsy was defined as clinical dysphonia and hypofunction of a vocal cord determined by nasopharyngolaryngoscopy. Postoperative nasopharyngolaryngoscopy was not performed routinely unless the patient had clinical dysphonia. Transient recurrent nerve palsy should have recovered within 6 months; persistent nerve palsy 6 months after surgery was defined as permanent recurrent laryngeal nerve palsy.

Serum calcium levels were determined before the operation, on the evening of the operation, and on postoperative days one and two. Transient

hypoparathyroidism was defined as serum calcium less than 8.0 mg/dL with or without symptoms of hypocalcemia, which recovered spontaneously within 6 months of the operation. If the patient required calcium or vitamin D supplementation for hypocalcaemia persisting for more than 6 months, hypoparathyroidism was defined as permanent.

STATISTICAL ANALYSIS

Results were expressed as mean ± SD. Data were compared with the Chi-square test and Fisher's exact test. Statistical calculations were performed with statistical software package SPSS Version 11.5 (SPSS Inc. Chicago). P-values of less than 0.05 were considered statistically significant.

RESULTS

Patients were classified into two groups according to the timing of the thyroid reoperation. One hundred and twenty-eight patients had underwent the second operation in the safe considered period, which is 90 days after the initial operation (group 1) while 113 patients had completion thyroidectomy performed within 10-90 days of the initial operation (group 2). The intervals between the initial and reoperative surgery was a median of 150 (range: 90-365) days for group 1 and 44 (range: 14-80) days for group 2. The mean age of the patients was 40.8 ± 12.8 years (range: 15-74) with a female/male ratio (F/M) of 179/62. There were no significant differences between the groups regarding age and sex.

PATHOLOGICAL RESULTS OF THE FIRST AND REOPERATIVE THYROID SURGERY

Histopathological diagnosis of the primary tumor was papillary cancer in 202 patients, follicular cancer in 23 patients, Hürthle cell variant in 9 patients and medullary carcinoma in 7 patients (Table 1). In 78 patients, histopathological examination revealed malignancy in the residual tissue. Modified neck dissection was performed in 62 patients and regional lymph node metastasis was present in 54 of those. Overall, 105 patients had malignancy in the residual thyroid tissue and/or in cervical lymph nodes.

TABLE 1: Histopathological classification of the primary tumor.

Pathology	Number of patients		
	Group 1	Group 2	Total
Papillary	116	86	202
Follicular	10	13	23
Hurthle cell	1	8	9
Medullary	1	6	7

COMPLICATIONS

There was no intraoperative mortality. Ten patients (7.8%) in group 1 had a transient serum calcium level less than 8.0 mg/dL, but none had clinical evidence of hypocalcaemia. In two of these patients (1.6%), hypoparathyroidism was persistent. In group 2, transient hypoparathyroidism was observed in 9 (8%) patients but in none of these patients hypoparathyroidism persisted beyond 6 months. There was no significant difference between the two groups regarding transient and permanent hypocalcaemia (p= 0.965 and p= 0.500).

Transient recurrent laryngeal nerve palsy occurred in one patient and permanent nerve palsy occurred in another patient (0.8%) in group 1. In group 2, transient recurrent nerve palsy was observed in 2 (1.8%) patients but there was no permanent nerve palsy. The incidence of transient and permanent recurrent laryngeal nerve palsy was comparable in group 1 and group 2 (p= 0.601 and p= 1).

There was no significant difference between the two groups regarding the incidence of complications (p> 0.05). The overall incidence of complications of completion thyroidectomy in our series was 7.9% transient and 0.8% persistent hypoparathyroidism, and 1.2% transient and 0.4% permanent recurrent laryngeal nerve palsy.

DISCUSSION

Tumor behavior and the clinical course of patients with differentiated thyroid carcinoma is largely unpredictable, so total thyroidectomy is favored.[1-5] Surgery for thyroid cancer should ideally be performed as a single procedure but it is not always

possible. In patients who are treated with partial thyroidectomy with a final diagnosis of cancer confirmed on permanent section, reoperation is required to remove all the remaining thyroid tissue.[9,11] Unfortunately, completion thyroidectomy is associated with increased morbidity.[12,15,16]

The rate of complications among patients undergoing completion thyroidectomy is apparently higher than in primary surgery.[12] Permanent injury to the recurrent laryngeal nerve has been reported to be 2-5%.[3,11-16,22] In various reports, the incidence of transient hypoparathyroidism was 0-15%, while permanent hypoparathyroidsm is less common but occurs in up to 3% patients undergoing completion thyroidectomy.[3,11,12-14,22] Completion thyroidectomy is technically more demanding compared with primary operations and requires more experience. Most complications of thyroidectomy can be avoided by detailed knowledge of the anatomy but the anatomy can change in redo surgery. Edema, bleeding and inflammation in the thyroid bed results in scarring thereby making dissection and identification of the landmarks challenging. Completion thyroidectomy requires a meticulous surgical technique and thorough knowledge of the potentially distorted anatomy found at exploration.

Davies declared that thyroid reoperation within 10 to 90 days was extremely difficult and hazardous because of dense adhesions and distorted anatomy.[18] Completion thyroidectomy was suggested to be performed either during the same hospital stay or after a 3-month period to avoid technical difficulties and to decrease the incidence of complications.[17,19-21] On the other hand, some studies concluded that timing might not have a strong impact on the incidence of complications of thyroid reoperations.[22,23] Since 1998, total and near total thyroidectomies have been performed in our clinic as the treatment of choice for multinodular goiter. We routinely perform unilateral lobectomy for solitary unilateral nodules. This policy eliminates the need for reoperation for thyroid carcinoma found incidentally after thyroidectomy. All patients included in our study had been initially operated in another institution and had been referred to our unit for further treatment; thus, none was reoperated within 10 days of the prior operation. In our series, we observed no significant difference between the incidence of complications in reoperations performed within 10-90 days or after 90 days of the initial operation. The most important factor determining the risk for complication is the type of former surgery.[23,24] If the initial procedure was a conservative operation such as isthmectomy or nodule enucleation, reoperation would not be too difficult because the dorsal aspects of both thyroid lobes were probably untouched. If a complete ipsilateral lobectomy was performed as the first operation and the contralateral lobe was not mobilized, the complication rates for completion thyroidectomy should not be different from the rates for primary surgery. Based on this, we excluded patients who had been initially treated by a lobectomy or hemithyroidectomy from our study.

Results of our study suggest that the timing of completion thyroidectomy does not have an impact on the incidence of complications. Though thyroid reoperations are technically more demanding than the initial operations, completion thyroidectomy can be performed safely with low morbidity by experienced endocrine surgeons.

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