

# REOPERATIONS AND MORBIDITY IN THYROID SURGERY

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## ABSTRACT

**Objective:** Due to adhesions and distorted anatomy resulting from previous operations, reoperations are associated with increased complication rates. This study aims evaluate the morbidity in reoperative thyroid surgery.

**Material and Method:** Medical records of 263 patients were retrospectively reviewed to examine the incidence of complications after reoperative thyroid surgery.

**Results:** Two hundred twenty three of the patients (%84.8) were female and 40 (%15.2) were male. Median age of the patients were 49 (range:13-85). The indication for reoperation was benign pathologies in 156 patients (59.3%) and malignancy in 107 patients (40.7%). Multinodular goiter (n:141, 53.6%) and papillary carcinoma (n:62, 23.6%) were the leading arguments for reoperation. 70% of the patients was referred from another institution. The first operation was subtotal thyroidectomy in 80

(30.4%) patients, nodule excision in 44 (16.7%) patients and near total thyroidectomy in 23 (8.7%) patients. In 116 patients (44%) no information was available about the first operation. 12 patients with tumor (4.6%) were submitted to a radioguided completion thyroidectomy. The mean operation time was 44.6 (30-118) minutes and the mean hospital stay was 1.2 (1-3) day. The complications encountered were transient hypocalcemia in 21 patients (8%), significant hypocalcemia in 5 patients, (2%), and transient vocal cord paralysis in 5 patients (2%). One case (0.4%) had a permanent vocal cord paralysis. No any other complication or mortality was seen.

**Conclusion:** For prevention of recurrence and/or reoperation necessity, the first operation must be sufficient in its extent and patients must be followed and treated adequately.

**Key Words:** Reoperation, thyroid, complication Nobel Med 2013; 9(2): 38-42

## TİROİD CERRAHİSİNDE REOPERASYONLAR VE MORBİDİTE

### ÖZET

**Amaç:** İlk ameliyat sonrası gelişen yapışıklıklar ve bozulmuş anatomi nedeniyle reoperasyonlarda komplikasyon oranlarında artış görülür. Bu çalışma tiroid cerrahisi reoperasyonlarında morbiditeyi değerlendirmeyi amaçlamaktadır.

**Materyal ve Metod:** İki yüz altmış üç hastanın tıbbi kayıtları reoperatif tiroid cerrahisi sonrası komplikasyonların insidansını incelemek için geriye dönük olarak gözden geçirildi.

**Bulgular:** Hastaların iki yüz yirmi üçü (%84,8) kadın ve 40'ı (%15,2) erkekti. Medyan yaş 49 (dağılım: 13-85). Reoperasyon için endikasyon 156 hastada (%59,3) selim ve 107 hastada (%40,7) habis patoloji idi. Multi nodüler guatr (n:141, %53,6) ve papiller kanser (n:62,

%23,6) reoperasyon için önde gelen girişim nedenleri idi. Hastaların %70'i başka bir kurumdan yönlendirilmişti. İlk ameliyat 80 (%30,4) hastada subtotal tiroidektomi, 44 (%16,7) hastada nodül eksizyonu ve 23 (%8,7) hastada totale yakın tiroidektomi idi. Yüz on altı hastada (%44) ilk ameliyat hakkında bilgi mevcut değildi. Tümörlü 12 hastaya (%4,6) "radioguided" tamamlayıcı tiroidektomi uygulandı. Ortalama operasyon süresi 44,6 (30-118) dakika ve ortalama hastanede kalış süresi 1,2 (1-3) gündü. Gelişen komplikasyonlar 21 (%8) hastada geçici hipokalsemi, 5 (%2) hastada belirgin hipokalsemi, 5 (%2) hastada geçici vokal kord felci idi. Bir hastada (%0,4) kalıcı vokal kort paralizisi vardı. Başka komplikasyon veya mortalite izlenmedi.

**Sonuç:** Rekürrens ve/veya reoperasyon gereksiniminin önlenmesi için ilk ameliyat yeterli genişlikte olmalı ve hastalar düzenli takip ve tedavi edilmelidir.

**Anahtar Kelimeler:** Reoperasyon, tiroid, komplikasyon *Nobel Med 2013; 9(2): 38-42*

### INTRODUCTION

Although not performed frequently, reoperation in thyroid surgery is associated with higher complication rates. Potential candidates for reoperation are patients submitted to interventions less than total thyroidectomy with residual disease and recurrence or de novo disease found on the remaining thyroid tissue.

Indications for reoperation in thyroid surgery are: 1-removing the residual tissue when thyroid cancer is found in the histological examination of the first operation's specimen (complementary thyroidectomy); 2-recurrent thyroid cancer; 3-cancer occurring on remaining thyroid tissue of patients having had a previous thyroid resection due to benign thyroid disease; 4-symptomatic recurrence of nodular or multinodular goiter; and 5-recurrent thyrotoxicosis.<sup>1-7</sup>

Due to adhesions and distorted anatomy resulting from previous operations, reoperations are associated with increased complication rates. So, most surgeons are not enthusiastic for reoperations.<sup>8,9</sup>

### MATERIAL and METHOD

Two hundred sixty three patients with benign or malignant thyroid pathology had been reoperated in the Endocrine Surgery Unit of Cerrahpaşa Medical School between 2001 and 2009. The first surgical initiative, indications for their reoperations, their histopathological diagnosis and complications

following their reoperations were obtained from medical records and evaluated retrospectively.

Vocal cord paralysis and hypoparathyroidism requiring calcium and vitamin D replacement persisting for more than 6 months after surgery, were defined as permanent.

Recurrent laryngeal nerve damage was seen as voice fade and loss of voice quality. All of the patients underwent preoperative laryngoscopic examination and those with postoperative voice disturbances were examined also after the reoperation.

### Surgical technique

The lateral approach is the preferred technique for reoperations in our clinic. The medial access may be appropriate when the integrity of the thyroid capsule has been restored at the first operation. After skin cut on surgical scar from previous operation, bottom and top flaps prepared the same as primer thyroidectomy. Following this procedure, in medial approach; to able to reach lodge fore thyroid muscles separated in the middle line or dissection is deepened between the anterior border of sternocleidomastoid muscle and sternothyroid muscle, and then entered the thyroid lodge through lateral by cutting omothyroid muscle. With lateral approach; it is easier to reach the upper pole and posterior side of remaining tissue by staying away the adhesiveness related to previous operation. Pulling the carotid sheath laterally and the thyroid medially the recurrent laryngeal nerve can be found→

| Table 1: Indications for reoperations  |             |           |             |
|--|-------------|-----------|-------------|
| Preoperative diagnosis                 | Female      | Male      | Total       |
| <b>Benign</b>                          |             |           |             |
| Recurrent multinodular goiter          | 126 (47.9%) | 15 (5.7%) | 141 (53.6%) |
| Recurrent multinodular toxic goiter    | 7 (2.7%)    | 4 (1.5%)  | 11 (4.2%)   |
| Compressing nodules                    | 3 (1.1%)    | 1 (0.4%)  | 4 (1.5%)    |
| <b>Malignant</b>                       |             |           |             |
| Papillary carcinoma                    | 51 (19.4%)  | 7 (2.7%)  | 58 (22.1%)  |
| Papillary microcarcinoma               | 1 (0.4%)    | 1 (0.4%)  | 2 (0.8%)    |
| Follicular variant papillary carcinoma | 1 (0.4%)    | 1 (0.4%)  | 2 (0.8%)    |
| Follicular carcinoma                   | 19 (7.2%)   | 9 (3.4%)  | 28 (10.6%)  |
| Medullary carcinoma                    | 7 (2.7%)    | 5 (1.9%)  | 12 (4.6%)   |
| Hurthle cell carcinoma                 | 4 (1.5%)    | 1 (0.4%)  | 5 (1.9%)    |

in the tracheoesophageal groove. The inferior thyroid artery too can be used as a guide. It is not always easy to expose recurrent laryngeal nerve at its regular anatomic position in these patients. In those conditions it is better to search the nerve at its lowest location, i.e. near the thoracic inlet or its highest position i.e. the cricothyroid junction just before it enters the larynx and follow it upward or downward respectively. Possible variations of the nerve should always be kept in mind.<sup>10,11</sup>

When the blood supply of any parathyroid gland is deemed precarious, it must be implanted into the sternocleidomastoid muscle.<sup>12</sup>

## RESULTS

Two hundred and twenty three (84.8%) of the patients were female and 40 (15.2%) were male. The median age was 49 (13-85). The indication for reoperation was benign pathologies in 156 patients (59.3%) and malignancy in 107 (40.7%). Among benign lesions multinodular goiter (n:141, 53.6%) and among malignant ones papillary carcinoma (n:62, 23.6%) were the most common (Table 1). 70% of the patients had undergone their first operation at another hospital. Those first interventions were subtotal thyroidectomy in 80 cases (30.4%), nodule excision in 44 cases (16.7%) and near-total thyroidectomy in 23 (8.7%). In 116 patients (44%) no sufficient data could be obtained. 12 of the tumor patients (4.6%) were submitted to completion thyroidectomy by the use of radioguided surgery. Histopathological exam revealed nodular hyperplasia (n:153, 58.2%) and papillary carcinoma variants (n:52, 19.7%) as the most frequent lesions (Table 2).

Reoperations were deferred for 3 months when the matter was a carcinoma. This interval lengthened when

other indications were at issue. It reached a maximum of 27 years in our series.

The preoperative laryngoscopic examination revealed vocal cord paralysis in 17 (6.4%) patients, 7 (2.6%) being at the right side, 10 (3.8 %) at the left. All of these patients, but one, have been operated in another institution. On that patients that had complementary thyroidectomy we have not seen any complication. Mean operative time was 44.6 minutes (30-118) and the mean hospital stay was 1.2 days (1-3). The hospital stay prolonged when complications occurred or because of additional medical co-morbidities requiring additional treatment. The operative site was vacuum drained in most of the cases.

Postoperative complications were as follow: transient hypocalcemia (21 patients, 8%), permanent hypocalcemia (5 patients, 2%), transient vocal cord paralysis (5 patients, 2%), (4 right vocal cord, 1 left vocal cord). One patient developed permanent vocal cord paralysis on right vocal cord (0.4%). No any other complication nor mortality was encountered.

## DISCUSSION

Reoperations on the thyroid gland are difficult interventions associated with dissection difficulties and ensuing higher complication rates even at specialized centers. Surgical experience and mastery of regional anatomy are essential to reduce the morbidity but it is not always sufficient.<sup>13</sup> The most common indication for reoperation in thyroid surgery is cancer treated unconsciously or erroneously with less than total thyroidectomy. Many surgeons and endocrinologists recommend total thyroidectomy as treatment standard for differentiated thyroid cancers.<sup>14-16</sup>

Multicentric tumour incidence in differentiated thyroid cancers varies between 25% and 88% and residual tumor incidence in the remnant thyroid is between 22% and 64%.<sup>4,17,18</sup> Consequently complementary thyroidectomy removes synchronous tumours in contralateral lob and multicentric foci in tissue left behind. Thus, residual disease risk disappears and anaplastic transformation risk lowers. Furthermore, removing all of the thyroid tissue increases response to an eventual radioiodine treatment.<sup>19,20</sup>

The aim of our study is not to evaluate the long term results of total thyroidectomy on thyroid cancers, but to review overlooked pathologic features and morbidity after surgery. Patients reoperated for recurrent goiter in our clinic are cases which gained functional autonomy during years. We think that, the main cause of this situation is inadequate conservative surgeries. →

In fact, in our cases reoperated for recurrent goiter, the index operation was isthmectomy, nodule enucleation, subtotal thyroidectomy or bilateral resections with conserved upper poles. It is admitted that, the cause of higher and earlier recurrence in patients treated with less than total thyroidectomy is the growth of macroscopically invisible missed nodules.<sup>21</sup>

The greatest difficulty and highest complication rates are encountered in patients submitted previously to bilateral subtotal thyroidectomy. In total thyroidectomized patients recidives occur in the remaining tissue frequently found adjacent to Berry ligament or incompletely removed Zuckerkandl tubercle or pyramidal lobe.

Preoperative fine needle aspiration biopsy and peroperative frozen section biopsy do not always provide correct diagnostic information in thyroid cancers. In well differentiated thyroid cancers, diagnosis can not be made until getting definitive pathological evaluation. The most appropriate attitude in this situation is, if possible, to perform hemithyroidectomy on the lesion side. Thus in case of reoperation there will be no residue in one side, and the lobe to be removed will be virgin. This attitude will result in lower complication risk.

The most feared complication in reoperations is recurrent laryngeal nerve injury. In our study, transient vocal cord paralysis developed in 5 patients (2%) and permanent vocal cord paralysis in one (0.4%). The study done by Bearhs and Vandertoll in 1961, reports the rate of vocal cord paralysis as 17% in 548 secondary thyroidectomies.<sup>22</sup> Complication rates decrease with the advances in surgical technique and increased surgical experience. According to the results of Pasięka et al. transient vocal cord paralysis is seen in 1.5% of 60 thyroid cancer cases treated by complementary thyroidectomy, without any permanent paralysis.<sup>4</sup> Calabro et al. reported similarly 1.5% transient recurrent nerve paralysis after complementary thyroidectomy.<sup>8</sup> There were only 2 patients with transient recurrent nerve paralysis out of 100 well differentiated thyroid cancer cases treated with complementary thyroidectomy by De Jong et al.<sup>6</sup> In Wax and Briant's complementary thyroidectomy series, 3% of patients developed transient recurrent nerve paralysis, but no permanent damage was observed.<sup>23</sup> The ratio of permanent recurrent nerve damage was 5.6% among 166 patients who underwent secondary thyroid surgery in the study of Seiler and colleagues.<sup>7</sup> In the study of Chao et al. among 115 patients submitted to complementary thyroidectomy; transient recurrent nerve paralysis ratio was 2.6% and permanent paralysis ratio was 1.7%.<sup>24</sup> In another study done by Eroglu et al. following

| Table 2: Pathological exam results |     |         |
|------------------------------------|-----|---------|
| <b>Malignant</b>                   | 70  | (26.6%) |
| Papillary cancer                   | 52  | (19.7%) |
| Follicular cancer                  | 12  | (4.6%)  |
| Hurthle cell cancer                | 4   | (1.5%)  |
| Medullary cancer                   | 2   | (0.8%)  |
| <b>Benign</b>                      | 193 | (73.4%) |
| Nodular hyperplasia                | 153 | (58.2%) |
| Thyroiditis                        | 14  | (5.3%)  |
| Follicular adenoma                 | 10  | (3.8%)  |
| Diffuse hyperplasia                | 9   | (3.4%)  |
| Hurthle cell adenoma               | 7   | (2.7%)  |

complementary thyroidectomy on 165 patients, 3% transient recurrent nerve paralysis, 5.5% permanent paralysis were reported.<sup>1</sup> The high ratio of permanent nerve paralysis in this study was, attributed to the fact that complementary thyroidectomy was performed in 36 cases (21.8%) of patients for locoregional recurrence or metastatic disease.<sup>1</sup> The incidence of nerve injuries can be further decreased by the use of intraoperative nerve monitorisation, which provides possibility of separating nerve clearly from other tissues and enables to control integrity of nerves, is being used like in many centres.<sup>25,26</sup> However in a 237 patient prospective study performed by Erbil et al. 409 recurrent nerve at risk were analysed in 2 groups, as a result of the study, in terms of postoperative complications there is no significant different between the groups.<sup>27</sup> To minimize complications related with the nerves is understood that the most important factors are experience and routine nerve exploration.

The low rate of vocal cord paralysis in our series can be partly explained by the lack of systematic postoperative laryngoscopic examination. Only symptomatic cases were directed to laryngoscopic examination in our study. It is well known that some vocal cord paralysis can be asymptomatic and missed.

Another feared complication in complementary thyroidectomy is permanent hypoparathyroidism. In our study, 8% (21 patients) transient and 2% (5 patients) persistent hypocalcemia were observed. These results are in accordance with the literature. It is stated that, transient hypoparathyroidism rates after complementary thyroidectomy are between 8% and 15%.<sup>4,6,24,28</sup> Permanent hypoparathyroidism rates were stated between 0% and 3.5% in several studies.<sup>1,4,6,7,23</sup> Transient hypoparathyroidism result from temporary ischemia of parathyroid glands. Parathyroid glands can be found in unusual locations due to previous dissection. It is not evident to expose them in the presence of fibrosis and scar tissue. As a result, dissection must be done carefully without relying solely on classic →

localisation knowledge during complementary thyroidectomy. If parathyroid glands can not be exposed due to fibrosis intracapsular near total thyroidectomy can be preferred in some conditions. This rule is also valid for recurrent laryngeal nerve.<sup>2,29</sup>

Inflammation, formation of scar tissue, hemorrhage and edema following surgery make anatomic structures more difficult to identify. Inflammation and fibrosis are at their lowest level during the first postoperative week. It is recommended that, complementary thyroidectomy should be performed within the first postoperative days or it should be postponed 3-4 months due to technical difficulty and to lower complication rates.<sup>8,30</sup>

As we never perform complementary thyroidectomy before the fourth month, we can not do any comment on the importance of that interval between first and second surgeries and its impact on complications.

## CONCLUSION

Some surgeons are reluctant to perform secondary thyroid surgery because of higher complication rates associated with it. However, abiding technical rules and mastery of anatomy reduce complication rates. Moreover, to prevent recurrence and/or reoperation necessity, the first operation must be sufficient in its extent and patients operated for goiter must be followed and treated adequately.

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| <b>✓</b> | <b>DELIVERING DATE:</b> 09 / 03 / 2012 • <b>ACCEPTED DATE:</b> 16 / 07 / 2012  |

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