



## Original Article

# Completion Thyroidectomy for Initially Misdiagnosed Differentiated Thyroid Carcinoma-Study of 51 cases

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### Abstract

**Introduction:** Completion thyroidectomy is the removal of any residual thyroid tissue that remains after a less than total thyroidectomy. This procedure is usually done when the final histopathology of the excised ipsilateral thyroid lobe reveals papillary or follicular carcinoma.

**Objective:** A retrospective analysis was done of patients undergoing completion thyroidectomy for thyroid malignancy who had undergone surgery elsewhere for solitary thyroid nodule. The incidence of complications in these patients after re-operation was investigated in this study.

**Material and Method:** Our study included a total 51 patients who had undergone thyroid lobectomy for a solitary nodule as initial surgery in our hospital & elsewhere and were admitted in our hospital for completion thyroidectomy when histopathology revealed malignancy in last 5 years (2014-2018).

**Result:** In this study-51 patients were enrolled; among them 42 were female and 9 male. Their mean age was 33.6 years (range-17-59 years). After initial surgery, the histopathology revealed papillary carcinoma in 45 patients (88.24%), follicular carcinoma in 6 patients (11.76%). Four out of 51 patients had recurrent laryngeal nerve palsy after initial surgery (7.8%). None of the patients had clinical hypocalcaemia after 1<sup>st</sup> surgery. Parathyroid glands are identified and preserved in all patients during completion thyroidectomy. No patient had additional recurrent laryngeal nerve injury in 2<sup>nd</sup> surgery. Mean follow-up was one year. Transient hypoparathyroidism occurred in 9.8% patients, but no permanent hypoparathyroidism. Seven patients were lost to follow-up.

**Conclusion:** Completion thyroidectomy is a safe and appropriate procedure for the management of initially misdiagnosed differentiated thyroid carcinoma.

**Keywords:** Completion thyroidectomy, Recurrent Laryngeal nerve, differentiated thyroid carcinoma.

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### Introduction

The optimal surgical management of differentiated thyroid cancer (DTC) is total thyroidectomy

except in case where the tumor is less than 1 cm in size and is of sclerosing, non-invasive, papillary type. In patients who have undergone less than

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total thyroidectomy for initially misdiagnosed DTC the potential exists for residual or recurrent disease in the remaining thyroid tissues,<sup>1</sup> hence the need for eliminating the thyroid remnant. Re-operation carries an increased risk of complications such as hypoparathyroidism and injury to the recurrent laryngeal nerve because of loss of normal tissue planes caused by scarring.<sup>2-10</sup>

Solitary thyroid nodule is one of the common presentations in ENT department. The usual evaluation for the solitary thyroid nodule includes fine-needle aspiration cytology (FNAC), which in many cases is inconclusive. This mandates hemithyroidectomy followed by completion in the majority of cases of DTC. Ultrasonography and FNAC has led to a 35%-75% decrease in the number of patients requiring surgery.<sup>11-14</sup>

We analyzed our data about post-operative complication in 2<sup>nd</sup> surgery; follow-up of the patient up to 1 year and their treatment outcome.

### Materials and Methods

Data of this study were obtained from patients who underwent surgery for initially diagnosed as solitary nodule or multinodular goiter elsewhere and were referred to our institute for completion thyroidectomy after postoperative histopathological diagnosis of DTC. From 2014 to 2018, a total 51 cases of DTC (which were previously misdiagnosed as benign lesion & operated as less than total thyroidectomy) were re-operated as completion thyroidectomy in our institute. All the patients underwent thorough clinical examination, neck ultrasonography, thyroid hormone assessment; indirect laryngoscopy and CT scan of neck were done before the second operation. All the histological slides and blocks of the first surgery were reviewed by the pathologist. Only patients with confirmed diagnosis of papillary carcinoma with tumor >2 cm, and all follicular carcinoma, were enrolled in the study of patients who underwent completion thyroidectomy. Serum calcium levels were detected pre-operative and postoperatively after 48 hours. All symptomatic patients were started on oral and intravenous calcium supplementation and asymptomatic patients with hypocalcaemia were

started on oral calcium supplementation. All patients underwent vocal cord assessment after the second surgery at the time of discharge. Postoperatively all patients with papillary and follicular carcinomas were referred to Nuclear Medicine Department for radioiodine ablation. Thereafter patients were followed every six months with serum TSH, Tg, antithyroglobulin and serum calcium level.

### Surgical Technique

The previous incision was revised and extended if necessary. After elevating subplatysmal flaps and retracting strap muscles in the midline, both sides of thyroid or thyroid bed and the isthmus were carefully evaluated for any thyroid tissue. Meticulous dissection was performed, approaching the thyroid gland laterally from the strap muscles. Microscopes were used during surgery, but nerve monitor was not used. The superior laryngeal nerve, recurrent laryngeal nerves and parathyroid glands were identified before resecting thyroid tissue. Where required, appropriate neck dissection was done. The central compartment was dissected in all cases.

### Results

There were 51 patients, 42 women and 9 men. Their mean age was 33.6 years (range from 17-59 years) (Table-1). The period between initial and second surgery ranged from 14 days to 120 days, with a median of 58 days. Mean operating time was 70 minutes. After initial surgery, the histopathology revealed papillary carcinoma in 45 patients (88.24%) and follicular carcinoma in 6 patients (11.76%). Four out of 51 patients had recurrent laryngeal nerve palsy (7.8%) after vital surgery. One or more parathyroid glands were identified and preserved in all 51 patients. No patient had additional recurrent laryngeal nerve injury at second surgery. Mean follow-up was 1 year. Transient hypoparathyroidism occurred after 2<sup>nd</sup> surgery in 5 patients (9.8%), (Table-2) but no permanent hypoparathyroidism. Seven patients were lost to follow-up.

There was no mortality and no chylous leak. There was no additional RNL palsy and the mean pre and post-completion thyroidectomy serum calcium

levels were 8.89 mg/dl and 8.72 md/dl respectively. There was no wound infection or haematoma requiring exploration.

**Table 1: Patient Demographics.**

Patient and Surgery Details	n
Age Group	
<20	3
20-40	37
40-60	11
Sex	
Male	9
Female	42
Surgery (1 <sup>st</sup> surgery)	
Hemithyroidectomy	29
Lobectomy	11
Subtotal thyroidectomy	11
Pathology (Histopathology)	
Papillary Carcinoma	45
Follicular Carcinoma	6

**Table 2: Complications**

Complications	n%
After first surgery	
RLN palsy	4(7.8%)
Hypocalcaemia	0 (0.0%)
After 2 <sup>nd</sup> surgery	
Additional RLN palsy	0 (0.0%)
Lost of follow-up	7(13.72%)
Transient hypoparathyroidism	5(9.8%)
Permanent hypoparathyroidism	0 (0.0%)
Mortality	0 (0.0%)

## Discussion

A completion thyroidectomy is required when papillary or follicular thyroid carcinoma is diagnosed postoperatively in patients undergoing partial thyroidectomy. It facilitates removal of the residual thyroid tissue/disease, permits screening and ablation of metastasis disease with radioactive iodine, and allows for thyroglobulin level monitoring, thereby eliminating the risk of recurrence of the tumor and prolonging survival.

In addition, it is reported that presence of multifocal tumor is associated with a high risk of lymph node metastasis.<sup>8</sup> Studies have reported residual tissue malignancy rates of 33% to 44%

after the completion surgery.<sup>2-7</sup> It was reported to be as high as 78% in Levings series.<sup>9</sup> Several authors have concluded that completion thyroidectomy is safe; associated morbidity and timing had no impact on development of complications.<sup>2-10</sup> The rate of the recurrent laryngeal nerve palsy varies from 0% to 4%<sup>2-11</sup>.

Although some studies recommend that completion thyroidectomy should be performed either before scar tissue development or after clinical remission of scar tissue, edema, and inflammation, recent evidence shows that timing of surgery has no effect on morbidity.<sup>7</sup>

Recurrent laryngeal nerve (RLN) injury can occur after thyroid surgery. The rate of RLN injury, mostly transient, ranges from 0.5% to 5%.<sup>15</sup> The risk is more important in patients who undergo re-operative thyroid surgery and in patients with thyroid cancer or hyperthyroidism.<sup>9</sup> A meticulous surgical technique can lower the postoperative morbidity if precise operative rules are respected.

In our study there was no additional RLN injury in completion thyroidectomy. We used surgical microscope for meticulous dissection and identification of the nerves and parathyroid. A nerve monitor was not used in this study. Completion thyroidectomy was shown to be a fairly safe procedure, which carries a low incidence of complications and also facilitates further management and follow-up with radioactive iodine. There was no recurrent laryngeal nerve palsy in the study by El-Zohairy and Zaher.<sup>16</sup> Similar results were noted with a 0% incidence of RLN injury when completion thyroidectomy was necessary for the treatment of thyroid malignancy, and it was effective for diagnosing and removing occult disease in the remaining thyroid by Kupferman et al.<sup>2</sup>

In another study of 647 patients, conducted by Gulcelik et al. who compared groups for complications, there were no significant differences except temporary hypocalcaemia between completion thyroidectomy and total thyroidectomy for differentiated thyroid carcinoma.<sup>17</sup> The routine use of intraoperative neuromonitoring seems not to reduce the incidence

of RLN during revision thyroid surgery, at least in the setting of a tertiary referral center.<sup>18</sup>

Hypocalcaemia after thyroidectomy is the most common postoperative complication, with a reported incidence from 0.5% to even 50% of the operated patients.<sup>19</sup>

Transient hypoparathyroidism is said to be present when oral/intravenous calcium supplements are required for less than six months after surgery and permanent hypoparathyroidism if hypocalcaemia symptoms last more than six months or when the requirement for oral calcium/intravenous supplements lasts longer than six months.

In a large series of 5,000 patients undergoing bilateral thyroid surgeries the overall incidence of transient and permanent hypoparathyroidism was 7.3% and 1.5%, respectively. Extent of resection and surgical technique had a greater impact on the rates of permanent postoperative hypoparathyroidism than thyroid pathologic condition.<sup>20</sup> Other series have reported an incidence of temporary hypoparathyroidism of 0% to 14%, and a permanent hypoparathyroidism incidence around 2% to 8%.<sup>2-7,10,21-23</sup>

With improvements in surgical technique and experience, complication rates of thyroidectomy performed for benign or malignant diseases are reduced. In spite of the improvement in surgical experience, temporary RLN palsy and hypoparathyroidism are the main complications in completion thyroidectomies, which need special attention.<sup>17</sup>

Hypocalcaemia occurred more frequently when neck dissection was combined with total thyroidectomy (60%) than without it (17%) ( $p < 0.005$ ). The incidence of hypocalcaemia was higher after central, than lateral, neck dissection.<sup>24</sup> In a series by Roh et al. the incidence of temporary hypocalcaemia 46.3%, and permanent hypocalcaemia 4.9%, in patients undergoing central compartment re-operation for recurrent/persistent differentiated thyroid cancer.<sup>25</sup> Other series did not reveal increased morbidity following central compartment dissection.<sup>26,27</sup>

In our study, transient hypoparathyroidism occurred in 5 (9.8%) patients. Seven patients were lost to follow-up.

We considered all patients for radioiodine ablation as the tumor size in previous histopathology reports could not be verified, and in a significant number of patients we found residual thyroid tissue in the previously operated thyroid bed.

### Conclusion

Completion thyroidectomy is a safe and appropriate option in the management of well-differentiated thyroid cancer. It removes disease on ipsilateral and contralateral sides of the thyroid and carries a low risk of recurrent laryngeal nerve damage, but a higher risk of permanent hypoparathyroidism. The incidence of hypocalcaemia was higher after central than lateral neck dissection. With improvements in surgical technique and knowledge, complication rates of completion or revision thyroidectomy are reduced.

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