

Transient and Persistent Hypoparathyroidism in Hemi and Total Thyroidectomy Cases



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Abstract

Introduction: Thyroidectomy is one of the most common surgeries conducted daily. Hypoparathyroidism is one of the most common complications of thyroidectomy. Sometimes it causes life threatening sequelae if not detected and managed early. Here in we studied the incidence and persistence of hypoparathyroidism in those who underwent total or partial thyroidectomy.

Method: A retrospective chart review study, we reviewed the records of 214 patients who Underwent thyroid surgery and followed their parathyroid hormone (PTH) and serum calcium (Ca++) results for new onset hypoparathyroidism in early postoperative period and long term follow up.

Results: Out of 214 patients, 183 met our criteria. 36.6% underwent hemithyroidectomy, 60.7% total thyroidectomy, and 2.7 % completion thyroidectomy. Hypoparathyroidism found in the 1st post-operative day in 37.7%. it occurs in 13.4% of hemithyroidectomy cases, and 53.2% of total thyroidectomy cases and 20% of completion thyroidectomy cases. 1 case only developed delayed onset hypoparathyroidism. Persistent hypoparathyroidism occurs in 1.5% of hemithyroidectomy cases, and 5.4% in total thyroidectomy cases. Apart from type of surgery, female gender was associated with higher incidence of transient hypoparathyroidism while male gender has higher incidence of persistent hypoparathyroidism.

Conclusion: Transient post-operative Hypoparathyroidism can occur even in hemithyroidectomy, and to much more extent in total thyroidectomy cases. Most of the post-operative hypoparathyroidism are improved within 1 month. Only few patients will need lifelong supplement.

Keywords: Hypoparathyroidism; Thyroidectomy; Transient; Persistent

Introduction

Surgery is the treatment of choice for symptomatic patients with goiter, although associated with a low rate of mortality and morbidity. Hypoparathyroidism is one of the well-known thyroidectomy complications. It sometimes causes life threatening sequelae if not detected and managed early. Hypoparathyroidism occurs more commonly with total thyroidectomy. But it can occur with hemithyroidectomy where the surgeon consider that two parathyroid glands are not touched, and they will work even if the other two are removed and discharging the patient ignoring this risk. However, we conducted this study to report the incidence and persistence of hypoparathyroidism in those who underwent total or hemithyroidectomy.

Method

A retrospective chart review study, we reviewed the records of 214 patients who underwent thyroid surgery in our tertiary

health care center between October 2012 and January 2017 looking for the incidence and course of hypoparathyroidism in these cases and the factors associated with this complication. Serum parathyroid hormone (PTH) and serum calcium (Ca++) results pre-operatively, 1st post-operative day and 6 months post operatively reviewed and correlated with the type of surgery. We included all cases of hemithyroidectomy, total thyroidectomy or completion thyroidectomy who has had normal parathyroid hormone preoperatively.. SPSS v.22 used for data analysis.

Results

Out of 214 cases, 183 met our criteria, 80.3% female and 19.7% males. Mean age was 40 years (SD:13.1). Regarding the type of surgery, 36.6% was partial thyroidectomy, 60.7% was total thyroidectomy, and 2.7 % was completion thyroidectomy. Hypoparathyroidism found in the 1st post-operative day in 37.7%. this incidence was different according to surgery type,

where it occurs in 3.4% in those whom surgery was partial thyroidectomy, 53.2% in total thyroidectomy cases, and 20% in completion thyroidectomy cases. All of cases were followed with PTH and Ca⁺⁺ in 3 and 6 months. Persistent hypoparathyroidism in partial thyroidectomy case seen in one case only (1.5%). Persistent hypoparathyroidism in total thyroidectomy seen in 5.4%. None of those who underwent completion thyroidectomy developed persistent hypoparathyroidism. Delayed onset

persistent hypoparathyroidism after normal post-operative PTH and Ca⁺⁺ (113 cases), seen in 1 case only. The incidence of both transient and persistent hypoparathyroidism was different among genders; however, it was not statistically significant. In females, the incidence of transient hypoparathyroidism was 39.5% while in males it was 30.6%, while persistent hypoparathyroidism was slightly higher in males (5.6% vs 3.4% in females) (Table 1-2).

Table 1: PTH: Parathyroid Hormone Showing the incidence of hypoparathyroidism in the first postoperative day in both males and females.

Type of Surgery	1 st Day Post-operative PTH		6 Month Post-operative PTH		Total
	Normal	Decreased	Normal	Decreased	
Hemithyroidectomy	58	9	66	1	67
	86.60%	13.40%	98.50%	1.50%	
Total Thyroidectomy	52	59	105	6	111
	46.80%	53.20%	94.60%	5.40%	
Completion Thyroidectomy	4	1	5	0	5
	80%	20%	100%	0%	
Total	114	69	176	7	183
	62.30%	37.70%	96.20%	3.80%	

Table 2: PTH: Parathyroid Hormone Showing the follow up of the PTH one month after the surgery in both males and females.

Gender	1 st Day Post-operative PTH		1 Month Post-operative PTH		6 Month Post-operative PTH		Total
	Normal	Decreased	Normal	Decreased	Normal	Decreased	
Male	25	11	34	2	34	2	36
	69.40%	30.60%	94.40%	5.60%	94.40%	5.60%	
Female	89	58	140	7	142	5	147
	60.50%	39.50%	95.20%	4.80%	96.60%	3.40%	
Total	114	69	174	9	176	7	183
	62.30%	37.70%	95.10%	4.90%	96.20%	3.80%	

Discussion

Postoperative hypoparathyroidism is an ongoing and frequently underestimated complication in thyroid surgery. In total thyroidectomy transitory hypoparathyroidism is the most frequent complication and occurs in 16.5 to 71% of patients [1-4]. Most patients with a low postoperative PTH recover function quickly, but it can take up to 1 year for full resolution [5]. The majority of patients with parathyroid dysfunction after thyroidectomy return to normal function within a few weeks or 1 month of surgery [6,7]. In the English literature, only one study tackled the hypocalcemia in partial thyroidectomy. In that study there was a non-significant decrease in mean calcium concentration from the preoperative determination (9.1mg/dL) to postoperative day one determination (8.4mg/dL) and then a significant mean increases in the calcium concentration from postoperative day one to day seven (9.0mg/dL). There was no statistical difference between the mean preoperative calcium concentration and the day seven mean calcium concentration. therefore, the need for calcium replacement or prolonged hospitalization was generally not necessary [8].

Injury to the parathyroid gland during thyroid surgery may be due to direct trauma to the glands, injury to the feeding vessels, accidental removal of the glands during surgery, or intentional removal for oncologic purpose [9]. In situ preservation of parathyroid gland during surgery is important to reduce the risk of postoperative hypoparathyroidism and hypocalcemia. If parathyroid glands could not be preserved during surgery, they should be auto transplanted in case where the parathyroid glands are not preserved in situ to prevent postoperative hypoparathyroidism [10,11]. Transient hypocalcemia is more in patients with retrosternal goiter than patients with goiter limited to the neck. Attention should be given to localize parathyroid glands especially the inferior parathyroid glands and avoid injury to their blood supply during total thyroidectomy in retrosternal goiter [12].

Identifying all four parathyroid glands is not always possible even by experienced surgeon due to their variable anatomic position. Therefore, surgeons need to be aware that if they are not able to localize the parathyroid glands, they should search

the resected thyroid gland for any removed parathyroid glands in order to perform autotransplantation [13]. In our study, the incidence of transient postoperative hypoparathyroidism occurs in more than half of cases of total thyroidectomy and was a common complication of hemithyroidectomy as well. Also, females have higher incidence of transient postoperative hypoparathyroidism than males. The recovery to normal occurs in most of the cases, more in females. Even hemithyroidectomy and completion thyroidectomy cases experienced temporary or persistent hypoparathyroidism, but in minority of cases. All cases of completion thyroidectomy recovered to normal, while only one case of hemithyroidectomy have persistent hypoparathyroidism.

Conclusion

Transient post-operative Hypoparathyroidism can occur even in hemithyroidectomy, and much more in those who underwent total thyroidectomy. Most of the post-operative hypoparathyroidism are improved within 1 months. Only few patients will need lifelong supplement. The risk of transient hypoparathyroidism as a complication of thyroid surgery was slightly higher in female patients, while persistent hypoparathyroidism was slightly higher in males.

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