Hypocalcemia After Minimally Invasive Thyroidectomy

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ABSTRACT

Title: Hypocalcemia after Minimally Invasive Thyroidectomy.

Objectives: Determine the incidence of hypocalcemia after minimally invasive thyroidectomy.

Study Design: A retrospective study was performed on patients receiving thyroidectomies between July of 2006 and July of 2008 to evaluate the incidence of postoperative hypocalcemia in patients undergoing minimally invasive thyroidectomy.

Methods: Retrospective nonrandomized study.

Results: 168 patients underwent thyroid surgery during the study period. 74 of these surgeries were performed by a minimally invasive technique through a 3 cm incision. Postoperative hypocalcemia occurred in 14 patients (18%) requiring supplementation with calcium and vitamin D for 2 weeks in the postoperative period to regain normal calcium status. No patients demonstrated symptoms of hypocalcemia. All patients demonstrated normal serum calcium levels at three weeks. The performance of minimally invasive total thyroidectomy was predictive of postoperative hypocalcemia.

Conclusion: Minimally invasive thyroidectomy is associated with a low rate of postoperative hypocalcemia compared to that reported previously after standard thyroidectomy.

INTRODUCTION

Minimally invasive thyroidectomy (MIT) has increasing been reported as an advancement in patient care.1-3, 6-8. Definitive studies supporting this remain lacking in part due to a lack of consensus of what defines the "minimally invasive" procedure and outcome data clearly supporting its benefit over the conventional procedure. While, the heralding of this technique has been questioned as a marketing gimmick by some due to this lack of data, it does make intuitive sense that if a procedure can be performed through a smaller incision with less local tissue trauma then improved cosmetic and post operative pain outcomes may result. Our purpose in this study was to assess whether the reduction in incisional length and external exposure during the performance of minimally invasive thyroidectomy (herein defined as performed through an incision 3 cm or less) contributed to a higher incidence of post operative hypocalcemia compared to conventionally performed thyroidectomies through larger incisions.

METHODS AND MATERIALS

Between July of 2006 and July of 2008, 168 patients with thyroid pathology underwent either hemithyroidectomy or total thyroidectomy by the senior author (DM). Patient demographic data was recorded. Indications for the procedure, the presence or absence of recurrent laryngeal nerve injury, as well as serum calcium levels at 12 hours, 24 hours, and 3 weeks postoperatively in all patients were recorded. Hypocalcemia was defined as serum calcium under 8.0 mg/dl for two consecutive measurements. Symptoms of hypocalcemia were ascertained in all patients. Oral elemental calcium at 1000 mg BID and vitamin D (1,25 dihydroxyvitamin D3) at 0.25 mcg BID was initiated in all patients with hypocalcemia on two consecutive measurements. Serum calcium levels were then obtained at 12 hour intervals until levels greater than 8.0 mg/dl were obtained, the patient was without symptoms of hypocalcemia and the patient discharged as is the routine of the senior author (DM). In those patients that developed hypocalcemia, serum calcium levels were assessed at two weeks and calcium/vitamin D supplementation was discontinued if serum calcium had normalized. Serum calcium level was then reassessed at 3 weeks to ensure normocalcemia. Length of hospitalization was recorded in all patients.

Of the total of 168 procedures, 74 were performed through an incision of 3 cm or less by a combination of an open minimally invasive approach and the use of endoscopic video assistance. 94 patient’s procedures were performed through incisions ranging from 3 to 7 cm secondary to a preoperative diagnosis of cancer requiring a central neck dissection (20), large goiters (33) and reoperation after previous thyroid surgery (11). In 30 patients the failure to gain adequate exposure through a 3 cm incision required the extension of the initial incision length to provide safe and adequate exposure during extraction of the thyroid gland from the pertinent local anatomy in convention with standard thyroid surgery principles to prevent a compromise of patient care.

RESULTS

74 minimally invasive thyroidectomies were performed during the study period. The indications for surgery in these patients were nontoxic multinoduler goiter (34), solitary thyroid nodule (20), symptomatic goiter (14), and hyperthyroidism (6). All patients had normal free T3 and T4 levels at the time of surgery. 40 patients underwent hemithyroidectomies and 34 patients total thyroidectomies. No patients developed recurrent laryngeal nerve injuries. 14 patients demonstrated hypocalcemia on two consecutive measurements drawn 12 hours apart and received supplementation with elemental calcium and vitamin D. No patients developed symptoms from their hypocalcemia. All cases of hypocalcemia occurred after total thyroidectomies. All normocalcemic patients were discharged on post operative day 1, with 13 of the 14 patients with hypocalcemia discharged by postoperative day 3. One patient required 4 days of supplementation to regain a serum calcium level above 8 mg/dl, the other patients developing hypocalcemia rapidly regained normocalcemic status. A shortcoming of our study rests in our failure to obtain intact parathyroid hormone levels in patients demonstrating hypocalcemia, which would have refined our assessment.

Conclusion: Minimally invasive thyroidectomy is associated with a low rate of postoperative hypocalcemia comparable to that reported previously after standard thyroidectomy.

CONCLUSIONS

The present study focuses on the incidence of hypocalcemia in patients undergoing MIT (incision length less than 3 cm). Our finding of an incidence of transient hypocalcemia of 18% in our study group and the increased relative incidence of transient hypocalcemia after total thyroidectomy is consistent with other series.6-8. Our adaptation of MIT with our focus on ligating the pertinent thyroid vascularity at the thyroid capsule and diligent attention to preserving the parathyroid glands and their vascularity in situ offers a means to prevent prolonged hypoparathyroidism.

In our study no patient developed symptomatic hypocalcemia or postoperative hypocalcemia beyond the second post operative week. With the exception of the one patient requiring 4 days of oral supplementation to regain a serum calcium level above 8 mg/dl, the other patients developing hypocalcemia rapidly regained normocalcemic status. A shortcoming of our study rests in our failure to obtain intact parathyroid hormone levels in patients demonstrating hypocalcemia, which would have refined our assessment. The findings of this study suggest that no additional risk in regard to the development of prolonged postoperative hypocalcemia is posed by the MIT technique. We did not seek to compare the MIT cohort to our patients undergoing conventional open thyroidectomy as they are dissimilar groups due to thyroid anatomy, disease state, and extent of resection making the utility of comparison of little additional value in regard to the aim of this study.

REFERENCES