Hypothyroidism following pediatric thyroid lobectomy

Adam D Goodale, MD1,2; David L Steward, MD2; Michael J Rutter, MD1

1 Division of Pediatric Otolaryngology, Cincinnati Children’s Hospital Medical Center, Cincinnati, OH, United States
2 Department of Otolaryngology – Head and Neck Surgery, University of Cincinnati

ABSTRACT

AIMS: Hypothyroidism following thyroid lobectomy can carry significant morbidity and should be recognized when present. There is limited literature in the pediatric population identifying the incidence and risk factors of hypothyroidism following thyroid lobectomy. We sought to identify the incidence, as well as risk factors, of hypothyroidism after pediatric hemithyroidectomy.

METHODS: This is a retrospective chart review of 46 pediatric patients who underwent thyroid lobectomy at Cincinnati Children’s Medical Center from 2007 – 2013. The incidence of postoperative hypothyroidism was based on thyroidal symptoms and clinical symptoms. The relationship between hypothyroidism and lymphocytic infiltration on pathology was investigated.

RESULTS: Twenty-nine patients met inclusion criteria (79% female; mean age 14.6 years; mean follow up 20.8 months). Four of 29 patients (13.8%) became biochemically hypothyroid postoperatively. Half of these patients displayed clinical symptoms of hypothyroidism in the immediate postoperative period. One of four patients (25%) became euthyroid without intervention. Patients with lymphocytic infiltration on pathology had nonsignificant higher hypothyroidism rates (40% versus 9%, P = 0.12).

CONCLUSIONS: We identified an incidence of hypothyroidism after pediatric lobectomy of 13.8%, half of these patients developed clinical hypothyroidism. The presence of lymphocytic infiltrates may increase the risk of hypothyroidism.

INTRODUCTION

• Hypothyroidism following thyroid lobectomy is well known in adults, but has not been well studied in pediatric patients
• Thyroid nodules are less common in children, but the risk of malignancy is markedly higher compared to adults
• 22% of adult patients develop hypothyroidism after lobectomy, 65-75% of these patients will have subclinical hypothyroidism
• Risk factors for hypothyroidism after lobectomy in adults include lymphocytic infiltration on pathology, elevated preoperative thyroid (TSH) levels, and the presence of anti-TPO antibodies, all of which suggest underlying thyroiditis and decreased thyroid function
• Children have a lower incidence of thyroiditis and may be at a lower risk for hypothyroidism after lobectomy

METHODS

• Retrospective chart review at a single, tertiary pediatric hospital from 2007 to 2013
• All patients were 18 years or younger at the time of surgery
• The following data points were collected: age, gender, indication for operation, preoperative serum TSH, postoperative serum TSH, pathology reports, length of follow-up, and clinical evidence of hypothyroidism
• All patients were euthyroid preoperatively and had a thyrotropin level obtained at least 6 weeks postoperatively
• Exclusion criteria:
  1) lack of postoperative follow-up or follow-up at an outside institution
  2) subsequent completion thyroidectomy
  3) actively taking medications known to cause hypothyroidism
  4) received previous radiation therapy to the cervical region
  5) taking levothyroxine prior to surgery.
• Hypothyroidism was defined as elevated thyrotropin level above the upper limit of normal at least 6 weeks after surgery
• For statistical analysis, a Student’s t-test was used for continuous variables and a Fisher’s exact test was used for categorical variables. A P-value less than 0.05 was considered statistically significant

RESULTS

• The overall incidence of postsurgical hypothyroidism was 13.8% (4 of 29 patients).
• 46 patients underwent thyroid lobectomy during the study period. 29 met inclusion criteria
• The most common reasons for exclusion was lack of follow up or follow-up at an outside institution (64.7%) and undergoing a subsequent completion thyroidectomy (11.7%).
• Lymphocytic thyroiditis on pathology did not show a higher incidence of hypothyroidism compared to patients without lymphocytic infiltrate (40% versus 9%, P = 0.12).
• There was no statistical difference in preoperative TSH values (P = 0.67) and no patients in either group had elevated preoperative TSH values.
• Two of the patients with hypothyroidism had subclinical hypothyroidism and two had clinical hypothyroidism.
• 50% (2 of 4) of patients with Hashimoto’s developed hypothyroidism after lobectomy

CONCLUSIONS

• Hypothyroidism following thyroid lobectomy can carry significant morbidity if not recognized and should be routinely assessed postoperatively with thyrotropin levels
• The rate of hypothyroidism we identified in children (13.8%) is notably lower than that in adults (22%)
• There was no correlation between preoperative thyrotropin levels and postoperative hypothyroidism.
• Studies have shown that 59% of adult patients with Hashimoto’s thyroiditis develop hypothyroidism after lobectomy. We found a similar incidence with 50% (2 of 4) of patients with Hashimoto’s developing hypothyroidism.
• Half of the patients developing hypothyroidism were subclinical while the other half developed clinical hypothyroidism. This is similar to the distribution reported in adult studies.
• Although children appear to be at a lower risk for hypothyroidism, a relatively large percentage will experience hypothyroidism and routine postoperative biochemical evaluation should be performed.
• Future studies with larger patient populations including multiple institutions would help to further elucidate the risks of hypothyroidism after lobectomy in children.

REFERENCES