Hyperthyroidism in the pediatric population is rare, and nearly always due to Graves’ disease. If medical therapy fails, thyroidectomy is the treatment of choice. Goals of perioperative management include: induction of a euthyroid state, sympathetic-attenuating anesthesia, and observation for signs of thyrotoxicosis.

Case: A 10 year-old girl with history of asthma presented for total thyroidectomy due to symptomatic hyperthyroidism secondary to Graves’ disease. Symptoms included a midline neck mass, weight loss, increased appetite, palpitations, and heat intolerance. She was initially started on methimazole and developed a severe rash, and later developed an allergic rash on oral potassium iodide drops (SSKI). She was admitted for an allergy pretreatment regimen, SSKI and titration of propranolol prior to her surgery. Anesthesia was induced with combined use of sevoflurane, propofol and fentanyl to achieve a deep plane of anesthesia, and the trachea was sprayed with 4% lidocaine prior to intubation. Sevoflurane and vecuronium were used for maintenance. Metoprolol was titrated as needed to treat tachycardia. No bronchospasm was noted intraoperatively. The patient was successfully extubated upon completion of the procedure, and discharged home on postoperative day one.

Discussion: One of the foremost concerns in the hyperthyroid pediatric patient presenting for surgery, is the potential for precipitation of thyrotoxicosis or “thyroid storm” secondary to physiologic stress response. Prevention and early recognition of thyroid storm are paramount, as mortality can be up to 20-30%. Preoperatively, both symptoms and biochemical markers direct anti-thyroid treatment to maintain a euthyroid state. In pediatric patients risks of therapy may outweigh benefits, especially for propylthiouracil, which is associated with liver toxicity, and propranolol, which can provoke bronchoconstriction. Intraoperative management includes continuation of beta-blockers, minimizing sympathetic stimulation, and observing for signs of thyrotoxicosis such as hyperpyrexia, acidosis, and arrhythmias. Thyrotoxicosis can be misdiagnosed as malignant hyperthermia. Differences suggesting thyroid storm include: less than expected acidosis, decreased creatinine phosphokinase, and lack of response to dantrolene. Thyrotoxicosis treatment includes decreasing production and peripheral conversion of thyroid hormones, antagonizing peripheral adrenergic effects, and supportive therapy.

Conclusions: The anesthetic management of pediatric patients undergoing thyroidectomy for symptomatic hyperthyroidism consists of preoperative attainment of euthyroid state, limitation of sympathetic stimulation, and intraoperative monitoring for signs of thyrotoxicosis.