Pediatric turbinectomy and turbinoplasty

Clinical Policy ID: CCP.1507

Recent review date: 1/2022

Next review date: 5/2023

Policy contains: Nasal congestion, turbinate hypertrophy, rhinitis, rhinosinusitis, turbinectomy, turbinoplasty

Coverage policy

Turbinectomy or turbinoplasty for children younger than age 18 are investigational/not clinically proven and, therefore, not medically necessary.

Limitations

No limitations were identified during the writing of this policy.

Alternative covered services

Balloon ostial sinuplasty.
Standard treatments for chronic nasal congestion, deviated septum, snoring, sleep apnea, or nosebleeds.

Background

The superior, middle, and inferior turbinates are bonelike structures in the inferior part of the nose that clean, warm, and humidify inhaled air. Turbinate hypertrophy, which can be caused by allergy, infection, and hormonal changes, results in nasal obstruction (allergic, vasomotor, or infectious rhinitis), as measured by the amount of air flow in the nose (Abdullah, 2021). A study of 544 children with allergic rhinitis found 438 (80.8%) were diagnosed with turbinate hypertrophy (Ciprandi, 2020).

Antihistamines, topical decongestants, and topical corticosteroids are often effective in treating nasal obstruction.

If these therapies are unsuccessful after three to six months, surgery can be considered (Komshian, 2019;

Scheithauer, 2010). Procedures include adenoidectomy, sinus puncture/lavage, open surgical approaches, endoscopic sinus surgery, balloon sinuplasty, turbinectomy, and turbinate reduction (Isaacson, 2015).

Surgical reduction of the inferior turbinate can relieve nasal block while retaining turbinate function. Surgery of the inferior turbinate involves removal of the mucosa, soft erectile tissue, and turbinate bone. Techniques include conventional (partial or total), laser, cryo-, and electrocautery turbinectomy. Because surgery results in excess loss of bone and mucosa tissue, turbinoplasty (which preserves functional medial mucosa) can be performed instead (Abdullah, 2021), most commonly by submucous resection or tissue ablation (Seidman, 2015).

Turbinate reduction surgery in children, as compared with adults, has been described as "contentious and debatable" due to concerns over complications like excessive bleeding, damage to the mucosa with synechiae and tear, disruption of nasal physiology and function, and disturbance of facial development (Abdullah, 2021).

One review states that "many surgeons feel it is prudent" to wait until the patient's nasal growth is completed before surgery is performed (Gary, 2017). Another contends that "no ideal standard technique for turbinate reduction has been developed," citing a lack of comparable long-term studies, but concedes anterior turbinoplasty to be the method of choice based on limited information (Scheithauer, 2010).

A review notes that turbinate reduction in the pediatric population can be achieved through turbinectomy, electrocautery, lasers, submucous microdebridement, and radiofrequency volumetric tissue reduction, but that consensus on the preferred approach is lacking (Komshian, 2019).

Findings

The American Association of Family Physicians' guideline on rhinosinusitis only addresses adult cases (Sedaghat, 2017). The American Academy of Otolaryngology's guideline on allergic rhinitis with nasal obstruction and enlarged inferior turbinates supports the referral of patients who failed medical management to specialists for surgery; children younger than age 2 were excluded from this guideline. The Academy concludes that "inferior reduction surgery is a reasonable option" for allergic rhinitis patients who have inferior turbinate hypertrophy with symptoms despite medical management (Seidman, 2015).

A guideline from the United Kingdom states that, in cases of turbinate hypertrophy refractory to medical management, evidence supports the safety of radiofrequency tissue reduction for turbinate hypertrophy, and supports efficacy up to two years after surgery. However, the guideline includes microdebrider-assisted and laser-assisted turbinoplasty as acceptable, but not turbinectomy (National Institute for Health and Care Excellence, 2014).

A review recommended that pediatric inferior turbinate hypertrophy treatment should start with three months of medical management, evaluation for adenoid hypertrophy for consideration of concurrent adenoidectomy, and, finally, radiofrequency volumetric tissue reduction or submucous microdebridement as first-line surgery (Komshian, 2019).

A literature review observed that non-mucosal-sparing turbinectomy surgery often results in postoperative complications (excessive bleeding, crusting, pain, and prolonged recovery period), and thus mucosal-sparing procedures (turbinoplasty) are typically the preferred option for cases of nasal obstruction refractory to conservative treatment (Abdullah, 2021).

A systematic review of 13 studies (n = 1,111) of turbinate surgery in children showed postoperative improvement in nasal congestion. Authors concluded the procedure to be safe, based on a complication rate of 3.12% — mostly minor bleeding, crust, and pain. Due to poor quality of studies, a surgical technique could not be recommended, but the safest are microdebrider-assisted inferior turbinoplasty, radiofrequency, coblation, and laser (Calvo-Henriquez, 2020).

A review of 1,770 children treated with an inferior turbinoplasty procedure at a Colorado hospital from 2003 to 2013 included 107 with an isolated procedure, namely radiofrequency ablation (72); microdebridement (19); and partial turbinate resection (21). None experienced major complications. Over half (54.0%) continued to require medical management; and authors note hypertrophy is not solely a surgical disease (Arganbright, 2015).

A systematic review of 58 studies analyzed results of surgery for inferior turbinate hypertrophy, excluding patients with refractory allergic/vasomotor/hypertrophic rhinitis. Turbinectomy and submucosal resection had elevated rates of crusting and epistaxis. Conservative treatments such as cryotherapy and submucous diathermy did not provide long-term results. Authors judged submucosal resection and radiofrequency ablation to have the most positive outcomes (decreased nasal resistance and preserved mucosal function (Sinno, 2016).

The Sinno review did not distinguish results for children and adults separately. Other large reviews exclude pediatric patients (Acevedo, 2015; Mirza, 2020; Pedersen, 2018; Wright, 2020).

A review of 11 studies (n = 730) on inferior turbinate reduction surgery included children ages 1 – 17 followed for up to 14 years. Turbinate surgery was the sole procedure in 79.1% of cases. Studies generally support the effectiveness of surgery, but outcome measures varied. Authors conclude “there is little evidence to support turbinate reduction surgery in children” (Leong, 2010).

A large review included children younger than age 18 who underwent tonsillectomy/adenoidectomy (n = 72,043), turbinectomy (n = 639), or both (n = 3,079). Adding turbinectomy did not significantly raise rates of 14-day relevant revisits (9.4% versus 8.6%, $P = .11$) or hemorrhage requiring cauterization (1.5% versus 1.4%; $P = .64$) (Yeun, 2017).

A review of 3,669 patients younger than 18 years old with endoscopic sinus surgery showed turbinate reduction had no significant impact on rates of readmission within 30 days (McKeon, 2019).

A survey completed by 103 pediatric otolaryngologists revealed 81% performed inferior turbinate surgery. Coblation was the most commonly used technique (51% of respondents), and a recent change to coblation or microdebridement was reported by 53% of respondents. Most (80%) turbinate surgeries were performed with other procedures, and 71% of respondents were satisfied or very satisfied with results (Jiang, 2012).

A study of 227 children younger than 10 years of age who underwent total (inferior) turbinectomy showed, after one year, 78.9% were free of nasal obstruction, plus another 14.5% with improved symptoms. However, 6.6% developed synechiae during wound healing, which often resulted in an operative intervention (Segal, 2003).

References

On October 27, 2021, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health

Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “nasal congestion,” “rhinitis,” “rhinosinusitis,” “turbinate hypertrophy,” “turbinectomy,” and “turbinoplasty.” We included the best available evidence according

to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

1/2022: initial review date and clinical policy effective date: 2/2022