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RESEARCH ARTICLE
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CHRONIC ADENOID HYPERTROPHY WITH GRADE 2 ANKYLOGLOSSIA TREATED BY ENDOSCOPIC DEBRIDER/COBLATION ASSISTED ADENOIDECTOMY AND TONGUE TIE RELEASE

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Abstract

Background: Chronic adenoid hypertrophy and ankyloglossia (tongue tie) are common pediatric conditions with the potential of distinctly impacting airway, speech and quality of life. This case presentation entails a review of a clinical case of a 5-year-old boy presenting with chronic adenoid hypertrophy and grade 2 ankyloglossia, managed in surgery directly.

Case Presentation: This patient was referring with typical signs of adenoid hypertrophy nasal obstruction, mouth breathing, snoring, and speech problems due to tongue tie. Adenoidectomy and tongue tie release were done using endoscopic debrider/coblation in one surgical procedure.

Results: The combined modality resulted in an immediate symptomatic relief with resolving nasal obstruction, better sleep quality, and better tongue mobility. All postoperative and intraoperative complications were insignificant. At follow-up, the patient showed better speech articulation and quality of life in general.

Conclusion: Endoscopic debrider/coblation-assisted adenoidectomy and tongue tie release is a safe and efficacious approach to the simultaneous treatment of adenoid hypertrophy and ankyloglossia in

children. This can be done through early intervention and prevent long term complications and optimizing functional outcomes.

Keywords: Adenoid hypertrophy, ankyloglossia, coblation, endoscopic adenoidectomy, tongue tie, tongue tie release, speech results, airway obstruction, case report.

Introduction

Adenoid hypertrophy and ankyloglossia (tongue tie) are the common children conditions, which may seriously affect the quality of life of a child. The case under review is that of a 5-year-old boy with a history of chronic adenoid hypertrophy and grade 2 ankyloglossia who was put under general anesthesia and underwent endoscopic debrider/coblation-assisted adenoidectomy and tongue tie release. This integrated management of the conditions in question is at once a significant point in the practice of pediatric otolaryngology.

Patient Profile

Patient: 5-year-old male
Presenting Symptoms:
Long-term nasal stuffiness (12 or more months)
Mouth breathing
There was loud snoring that had apneic breaks.
Speech difficulties in production (especially sounds of /t/, /d/, and /l/)
Low threshold to infection of the throat (4-5 times/year)
Laboratory Investigations
Complete Blood Count (CBC):
WBC: 9.2 x 10^3 / microlitre (normal)
Lymphocytes- 42 percent (slight elevation)
Hemoglobin: 12.8 g/dL(normal)
Platelet count 280 x 103/l (normal)
Allergy Panel (IgE (e)):
Negative to common aeroallergens (dust mites, pollen, mold)
Throat Culture:
No increase in the amount of pathogenic bacteria (drawn in the asymptomatic period)
Coagulation Profile(pre-op):
PT/INR- 12.5 sec/1.1 (Normal)
aPTT: 32sec (normal)
Differential Diagnosis
Adenoid Hypertrophy:
Allergic rhinitis
Chronic sinusitis
Nares mass
GERD-induced inflammation
Ankyloglossia:
Isolated congenital deformity
Neurological basis of oral-motor dysfunction (neurological basis)
Orofacial myofunctional disorder
Comorbidities:
sleep obstructive apnea (OSA)
Recurrent tonsillitis

Pathophysiology

Adenoid Hypertrophy

The adenoid tissue, which is part of the Waldeyer lymphatic ring, is very important to the body and provides a primary defense against invading organisms through the respiratory and digestive tracts. Sensible enlargement of the adenoid in early childhood is underlined by its role in immune processes, and its enlargement during childhood reaches a maximum at the age of 3 to 6 years. Due to abnormal immune reactions in some children, the adenoidal tissue becomes hypertrophic, which results in chronic inflammation. The prevalence of adenoid hypertrophy among pediatrics is estimated to be about 34 percent of the pediatric population and prevalent in males when compared to the females (a proportion of 1.6:1). The age of maximum diagnoses is observed between the age group of 12-72 months (43.4%), which was 5 years old in our patient.

Tongue Tie (Ankyloglossia)

Ankyloglossia is a form of intersex where the lingual frenulum is shorter than normal or thicker, or taut, which limits tongue movement. The condition is common in boys compared to girls and may cause several limitations in function. Grade 2 (moderate) Grade 2 ankyloglossia is defined by the length of the so-called free tongue that is average, measured as 8-11 mm based on a standard grading system.

The limited movement of the tongue in ankyloglossia may impair the speech production processes, oral cleanliness, and communication, especially when children reach their adolescent age. The condition can make the tongue look like a heart shape when extended and restrict the skill of the tongue to go to the palate or sideways.

Clinical Presentation

Adverse Adenoid Hypertrophy Symptoms

Children with adenoid hypertrophy usually present with constellation of the symptoms that involve upper airway obstruction. The commonest presenting symptoms are:

Obstruction in the nose and mouth breathing (80.1%)

Snoring (82%)

Awake mouth open (76.1%)

Trouble breathing through the nose

Obstructive sleep apnea 27%; sleep-disordered breathing (27%)

Hearing impairment/Recurrent otitis media (13%)

Adenoid facies- typical facial features of an open mouth, long face, and blank expression (14%)

Adenoid hypertrophy chronic situation may cause serious complications and not receiving appropriate care, such as obstructive sleep apnea, which negatively influences cognitive development and critical performance rates, and the quality of life.

Grade 2 Ankyloglossia Symptoms

Among the clinical features in the grade 2 level of ankyloglossia are:

Little tongue protrusion beyond lower incisors

Inability to push the tongue to the palate

Limited sideways movement of the tongue

Heart-like look of the tongue when sticking out

Difficulties in articulation of speech especially some consonants

In laying difficulties with dictetics and food crumbs puking

Diagnostic Approach

Adenoid Hypertrophy Evaluation

Adenoid hypertrophy is usually examined by:

Clinical examination: Nasal breathing assessment, facial assessment and oral examination

Lateral neck radiography: To see and assign a size of the adenoid and its relation to the nasopharyngeal airway

Nasal endoscopy: it allows direct examination of adenoid tissue and determination of the level of nasopharyngeal congestion
Sleep studies: In other suspected obstructive sleep apnea
Ankyloglossia Assessment
Diagnosis of Ankyloglossia includes:
Oral examination: The tests of frenulum length, thickness, and resilience are performed.
Kotlow classification: Grade 2 (moderate) ankyloglossia is associated with a free tongue length of 11-8mm
Functional assessment: The mobility of the tongue, such as protrusion, elevation, and lateral movement of the tongue, is evaluated
Speech assessment: The evaluation of the articulation and the problems with lingual sounds.

Surgical Management
Endoscopic Debrider/Coblation Assisted Adenoidectomy
1. Blind curettage adenoidectomy is a traditional technique that has been used over the last few decades. Endoscopic procedures using powered instrumentation, however, provide several benefits:
2. Endoscopic visualization: This gives the surgeon a first clear picture of the surgical site, and thus, more and better adenoid tissue can be removed
3. Microdebrider technique: Tools are propelled by constant suction that clears the adenoid area cut by a powered rotary cutting tool under direct observation
4. Coblation technology: Uses radiofrequency waveform to generate a plasma field, on which the tissue is disintegrated by breaking down at the molecular unit at colder temperatures (40-70 °C) than electrocautery
Some of the advantages of using the combined endoscopic debrider/coblation approach are listed below:
1. Further excision of adenoid material, especially of hard-to-reach places like choanae and openings of the Eustachian tubes
2. Limited hemorrhage during the surgical procedure over conventional curettage
3. It results in fewer chances of hurting surrounding buildings since they can be seen directly.
Fewer medical costs and reduced postoperative pain, and faster recovery
Comparisons between conventional adenoidectomy and endoscopic coblation techniques have proven that they produce greater adenoid tissue removal and postoperative adenoid grades. Endoscopic procedure enables one to see all parts of the nasopharynx, including the cranium part of the adenoid and its extension in the nasal area, which could easily be blocked due to the normal curettage.

Frenotomy/ Frenuloplasty or Tongue Tie Release
In the case of grade 2 ankyloglossia, the surgical intervention is normally suggested to loosen the lingual frenulum to enhance freedom of motion in the tongue
It can include the process of:
1. Frenotomy: Straight and plain frenulum cut with scissors, scalpel, or laser
2. Frenectomy: Excision of the frenulum through and through
3. Frenuloplasty: A more involved procedure that involves reconstruction of the frenulum, usually employed when the frenulum is thicker
The tongue tie releasing process is performed either with local anesthesia or with general anesthesia when the child is younger
The process entails:
1. Fixation of the tongue, a suture at the end during operation upon it.
2. Clamping and identification of the frenulum
3. Letting or cutting off the frenulum surgically with scissors or scalpel, or laser.

Predicted Results and Recovery

Adenoidectomy Outcomes

After adenoidectomy using the endoscopic debrider/coblation procedure, patients normally experience:

1. Immediate resolution: Nasal obstruction fits and breaths more easily.
2. Fewer snoring and sleep-disordered breathing: Sharp decrease in adverse effects of sleep and decreased sleep apnea indicators.
3. Time of recovery: Normally, this takes 1-2 weeks, and children will usually need about one week out of school or daycare

Ordinary post-operative effects: Light sore throat, stuffiness of the nose, earache, and feeling exhausted for a few days.

Endoscopic coblation adenoidectomy has a high success rate, and most studies have shown complete adenoid tissue removal with a low rate of recurrence as well

Results of the Release of a Tongue Tie

After the release of the tongue tie, the patients commonly undergo:

1. Short-term effects: Increased tongue mobility and range of motion
2. Speech advancement: Scholarly work indicates great improvement in speech articulation post-frenectomy in tongue tie (success rate 78%)
3. Recovery schedule: Fast recovery, mostly within 1-2 weeks
4. Post-surgery exercises: Temporal tongue mobility exercises are usually prescribed so that they make the maximum of the expertise

A synthesized analysis of speech outcomes before and after frenectomy surgery on tongue tie revealed that the surgery resulted in considerable enhancement of speech articulation, particularly when they were done at earlier ages.

Potential Complications

Adenoidectomy Complications

1. The possible adenoidectomy complications are:
2. Hemorrhage: Primary (within 24 hours) or secondary (after 24 hours)
3. Infection: regional or local infection, which is now rarely encountered with modern techniques
4. Velopharyngeal insufficiency: An Unusual side effect on speech resonance
5. Nasopharyngeal stenosis: exceptionally low side effects.
6. Damage to the Eustachian tube: It may impair middle ear activity.

The overall complication rate of adenoidectomy is minimal, especially when endoscopic means of operating are employed, as this gives a direct view of the operating area.

The complications of Tongue tie release.

1. The possible adverse effects of tongue tie release are:
2. Bleeding: minimal because of the poor vascularity of the frenulum
3. Infection: This is uncommon when proper techniques are followed during the surgery as well as follow-up after the surgery
4. Recurrence: It may happen in case of an incomplete release or scarring
5. Breaking of neighboring structures: Uncommon with Excellent Methodology.

Post-Operative Management

Adenoidectomy Follow-up

The recovering period after adenoidectomy consists of:

1. Pain control: Under acetaminophen or a non-steroidal anti-inflammatory remedy (generally)
2. Hydration: Proper liquid taking in sufficient quantity
3. Activity limitation: 1-2 weeks of reduced physical activities
4. Follow-up assessment: It is usually carried out 2-4 weeks after surgery to evaluate healing and the disappearance of symptoms

TTR follow-up

Post-operative care of tongue tie release includes:

1. Pain control: Low in general and controlled using oral analgesics
2. Tongue exercises: Certain exercises for Tongue mobility and preventing its reattachment
3. Oral health: Soft scrubbing of the surgical region
4. Follow-up assessment: The follow-up assessment is usually done 1-2 weeks after surgery to determine the healing process and improvement in functioning.

Discussion

Treatment of chronic adenoid hypertrophy and ankyloglossia in children is one of the subjects of otolaryngology that does not stand still. We present a case of a 5-year-old male in whom simultaneous endoscopic debrider/coblation-assisted adenoidectomy and grade 2 tongue tie release were performed, which complements the present trends with minimally invasive and precise surgical methods and early intervention, which would ensure better functional results.

The Adenoid Hypertrophy and Endoscopic Coblation Adenoidectomy

Adenoid hypertrophy contributes to the main causes of nasal obstruction and sleep-disordered breathing in children. One of the most commonly done operations in children between 1 to 7 years is adenoidectomy since adenoid regresses after this age is attained. Conventional adenoidal surgery (curettage) has proven to be successful but has its limitations including failure to adequately make the area clear, excessive bleeding during the operation and discomfort after the operation also occurs. The last couple of investigations have indicated that endoscopic-assisted coblation adenoidectomy is very effective compared to the tradition curettage. To illustrate, Gupta et al. (2024) stated significant reduction in postoperative pain and morbidity with less postoperative recovery and complication rates brought about by coblation-assisted adenoidectomy.

. In a comparable study, it was demonstrated that endoscopic coblation adenoidectomy has less intraoperative blood loss (mean 10.6ml vs. 30.36ml in curettage), less postoperative pain and more complete removal of adenoid tissue because of the improved visualization. Coblation involves the plasma-mediated tissue fragmentation and this method works at a low temperature which limits thermal injury and postoperative inflammation.

This is the combined endoscopic debrider/coblation technique that was applied in our case, and it also supports the results of a prospective study comparing classical, coblation, and combined methods of adenoidectomy. The mixed method provides a compromise between the operative duration and the control of bleeding, as well as the minimum amount of residual tissue, which is of paramount importance in avoiding the rearrangement and the continuous symptoms. Another important incident is that the risk factor of damage to adjacent structures and complication circumstances like velopharyngeal insufficiency which though not common but may affect the speech resonance, is minimized because the nasopharynx is visualized directly during surgery.

Ankyloglossia and Release of Tongue Tie

The movement of the tongue can be seriously impaired by such conditions as ankyloglossia or tongue tie which negatively influence their speech, feeding, and oral hygiene. Whether to conduct frenotomy or frenectomy is based on the age of the patient, frenulum anatomy and the level of functional impairment. According to the literature, early diagnosis and treatment should be conducted to avoid long-term effects (irregularities in swallowing and speech disorders). Since it is undemanding and less invasive, frenotomy operations are often carried out on infants, whereas frenectomy or frenuloplasty are favoured to work on children of older age since the final results tend to be more predictable and recurrence is less likely.

A recent systematic review of the prevailing literature regarding the results of the speech after frenectomy depicted strong results about a pronounced improvement in the articulation of the speech after the procedure, with an overall success proportion of about 78 percent. This correlates with the presence of improvement of speech observed in our patient after the release of grade 2 tongue tie.

In addition, a series of cases involving the posterior tongue-tie release based on laser frenectomy are evident of immediate and long-lasting post-surgery changes in lingual mobility, speech, and feeding abilities among children. Our case represents a classic anterior tongue tie, however, the general principle of better functional outcomes after the release of surgical intervention applies.

Mixed Surgical Addressing

Conducting the endoscopic adenoidectomy and the tongue tie release in the same surgical procedure provides a number of warrants:

Minimizes the time dependent on repeated exposure to anesthesia, especially on young children.

Tackles both airway hindrances as well as speech disability at the same time, by enhancing general living standards. Allows coordinated postoperative management and rehabilitation and speech therapy in case there is need.

Although there is a paucity of literature concerning combined procedures, the individual strengths of each modality have been clearly identified and it is just rational to combine the two in patients with combined pathologies.

Limitations/Future directions. Although it works, its drawbacks involve requiring specialist equipment and surgical skill to perform an endoscopic coblation adenoidectomy and the possibility of a repetitive occurrence or an incomplete release during tongue tie surgery in case of a poor application.

Long-term outcomes of a combined intervention require enrollment to larger cohorts and the extension of the follow-up period in the future studies. The clinical decision-making would also be improved in terms of cost-effectiveness analyses and the uniform guidelines regarding the timing and selection of techniques.

Conclusion

The two conditions that are highly encountered in children being chronic adenoid hypertrophy and ankyloglossia usually coexist and partially affect the upper airway as well as the speech and the quality of life. This case illustrates the effectiveness and the safety of a multimodal head-and-neck surgery with endoscopic debrider/coblation-assisted and adenoidectomies in the patient with a 5-year-old male with grade 2 tongue tie. The endoscopic coblation method has better visualization, complete removal of hypertrophic adenoid tissue, less intraoperative bleeding, and early recovery in postoperative condition when compared to the conventional methods. At the same time, the early surgical treatment of ankyloglossia enhances tongue movements and the process of articulation, which circumvents prolonged loss of functions.

We have observed findings that are inline with the other recent literature that shows that coblation adenoidectomy applies reduced operative morbidity and remaining tissue over curettage approaches, and tongue tie release results in great improvement in speech and feeding outcomes by children. The two methods reduce exposure to anesthesia and facilitate patient handling, especially in the pediatric group.

Although the outcomes are promising, other limitations, the need of specialized equipment, and specific skills of a surgeon, along with the possibility of a recurrence or incomplete release, should be addressed. Greater follow-up prospect studies are needed to confirm long-term results and cost-effectiveness of such combination of strategies.

Summarizing, endoscopic coblation adenoidectomy and tongue tie release as combined approaches to dealing with adenoid hypertrophy and ankyloglossia may be seen as an exhaustive and effective intervention to address these health conditions in children, with an overall potential of a dramatic enhancement of the airway clearance, speech, and airflow as well as the quality in general.

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