

EARLY PALATE EXPANSION FOR KIDS WITH DOWN SYNDROME

OVERVIEW

People with Down syndrome (T21) are prone to have a narrow arch in their palate. This can cause a variety of issues, and is therefore ideal to address early. The middle 1/3 of the face of children with T21 (the sphenoid bone) does not grow properly, and compresses all the major head glands. In particular, it can prevent the proper functioning of the pituitary gland and all its hormones, from growth to TSH. The goal is to widen the top palate. It is not just about teeth, but about the fact that the middle third of the face does not grow in proportion to the rest of the face in children with T21.

POTENTIAL BENEFITS OF PALATE EXPANSION

- Expand the lower face to give a more even appearance
- Make more room for the teeth
- Relieve pressure on the nasal and ear passages
- Improve clarity of speech
- Promote growth in the middle third of the face
- Help to resolve sleep apnea
- Lessen occurrence of ear and sinus infections
- Increase space for sinuses to drain, improving nasal congestion
- Facilitate proper function of thyroid

ISSUES WITH UNDERGROWTH OF SPHENOID

Draw a line from the eyebrow to the back of the occipital and the upper lip to the back and look at all the functioning impaired by undergrowth of the sphenoid. These are all the functions impaired when the middle third of the face is too small.

Hypothalamus

Thyrotropin-releasing hormone
Dopamine
Growth hormone-releasing hormone
Somatostatin
Gonadotropin-releasing hormone
Corticotropin-releasing hormone
Oxytocin
Vasopressin

Thyroid

Triiodothyronine
Thyroxine

Pineal gland

Melatonin

Pituitary Gland

Anterior pituitary

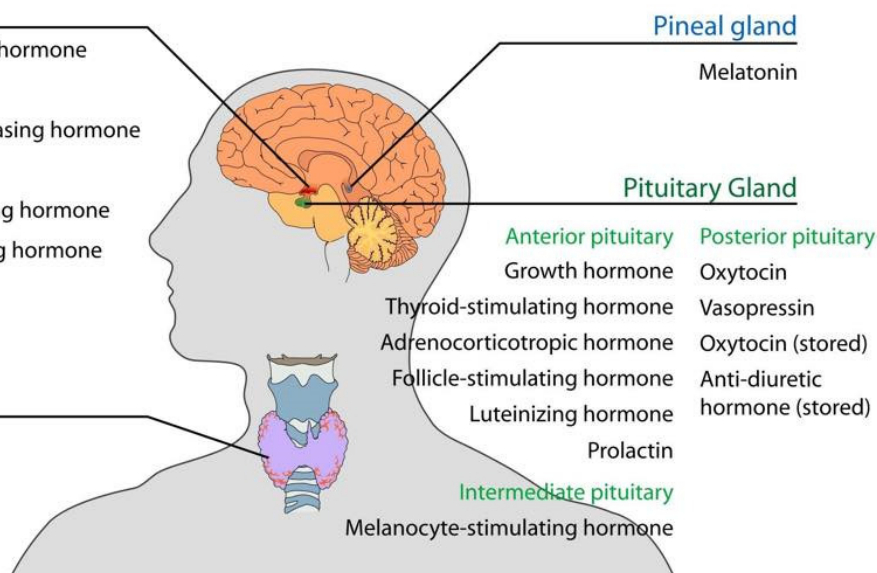
Growth hormone
Thyroid-stimulating hormone
Adrenocorticotrophic hormone
Follicle-stimulating hormone
Luteinizing hormone
Prolactin

Posterior pituitary

Oxytocin
Vasopressin
Oxytocin (stored)
Anti-diuretic hormone (stored)

Intermediate pituitary

Melanocyte-stimulating hormone



TYPES OF APPLIANCES

- Traditional RME/RPE (Rapid Maxillary/Palate Expansion) – cemented to the permanent molars and requires daily adjustment with a key
- Biobloc
- ALF (Alternative Lightwire Functionals) - <http://www.alforthodontics.com/>
- One appliance that requires no teeth (don't have the name of it)
- Removable appliance similar to a retainer, split in the middle, you crank to adjust (don't have the name of it)

RELATED THERAPIES

- Oral Facial Myology
- Castillo Morales Palatal Plate - Acrylic Plate that rests in the mouth with a crater in the middle
- Combined Crozat/Facemask orthodontic treatment

OBJECTIONS & RESPONSES

Child is too young to cooperate with making the impression and/or installing the appliance.

- Sedation
- Practice with a MYO Munchie (<http://www.teethperfect.com/>) until child can hold it in mouth for 1 minute
- Ask dentist to give you an "impression" plate to practice with for a couple of weeks prior to the procedure. It's worth getting child used to it before the real impression is made. An orthotropic dentist one parent saw recently said to put some mashed potato or something of that texture in it after a week or so of practicing with just the plate, and to be prepared to hold still with the plates for 30 seconds.
- Watch videos of child having procedure or just at the dentist, to show the child it isn't scary etc.
- Create a book with sequence of events to teach child what to expect

Cannot be done until child is at least 7 years old and has permanent molars

- The appliance can be successfully cemented to other teeth

If you turn the expander too fast, it can negatively affect the nasal bones in a toddler.

- Some dentists recommend going at half speed, turning it every other day instead of every day

BLOGS/TESTIMONIALS

<http://www.thedownsyndromeactionplan.blogspot.com/2013/01/long-overdue-update.html> - Blog post about a little boy who had palate expansion done just after his 4th birthday, and the amazing results

<http://www.thedownsyndromeactionplan.blogspot.com/2013/06/six-months-post-expansion.html> - same little boy, 6 months post expansion

RESEARCH, STUDIES, OTHER RESOURCES

1. **Down syndrome: otolaryngological effects of rapid maxillary expansion**
Conclusion: Rapid maxillary expansion resulted in a reduction in hearing loss, yearly rate of ENT infections and parentally assessed symptoms of upper airway obstruction, compared with no treatment. These findings are probably related to expanded oronasal space, due to rapid maxillary expansion.
<http://www.ncbi.nlm.nih.gov/pubmed/18577269>
2. **Rapid maxillary expansion and nasal patency in children with Down syndrome**
Conclusion: Rapid maxillary expansion produced a significant augmentation of nasal volume in children who had been treated ($p < 0.05$) compared to the control group; these results were stable through the period of retention.
<http://www.ncbi.nlm.nih.gov/pubmed/16008071>
3. **Maxillary expansion therapy in children with Down syndrome.**
Conclusion: Maxillary expansion can be undertaken in DS children and is successful in a high proportion of cases if correct case selection has been performed. These patients, however, may require a slow activation of the appliance during the expansion phase and are more susceptible to the appearance of oral ulceration, which can affect the course of treatment.
<http://www.ncbi.nlm.nih.gov/pubmed/21462762>
4. **Castillo-Morales' orofacial therapy: treatment of 67 children with Down syndrome.**
Conclusion: Castillo-Morales' therapy with 67 Down syndrome children (average age at start of therapy 13.9 months), who wore the palatal plate intermittently for an average of 12.1 months. Significant positive results were obtained in spontaneous tongue position, upper and lower lip tonicity and position, mouth closure, drooling and sucking.
<http://www.ncbi.nlm.nih.gov/pubmed/1828445>
5. **A four-year longitudinal study of palatal plate therapy in children with Down syndrome: effects on oral motor function, articulation and communication preferences.**
Conclusion: After 4 years of palatal plate therapy, orofacial function had improved significantly in the 9 PPG children and specifically in terms of tongue position and lip activity.
<http://www.ncbi.nlm.nih.gov/pubmed/12635780>
6. **Orofacial development in children with Down's syndrome 12 years after early intervention with a stimulating plate.**
Conclusion: The follow-up examination (of children treated with Castillo Morales stimulating plate) showed that the improved orofacial appearance resulting from the early treatment had remained stable in most cases.
<http://www.ncbi.nlm.nih.gov/pubmed/14749890>
7. **Long term effects of the palatal plate therapy for the orofacial regulation in children with Down syndrome.**
Conclusion: The results showed distinct improvement in nearly all of the parameters (spontaneous lingual protrusion based on three level scale, position "open mouth", labial hypotonia and sialorrhea) compared to initial conditions.
<http://www.ncbi.nlm.nih.gov/pubmed/14604150>
8. **Weston A. Price British Identical Twin Study and Teen with Down syndrome**
Summary: Teen with Down syndrome treated with expansion device, widened $\frac{1}{2}$ " in 6 months.

Notable increase in IQ and improvements in other areas as well. Also see the twin study.

<http://www.westonaprice.org/holistic-healthcare/from-attention-deficit-to-sleep-apnea/>

9. **Metric analysis of the hard palate in children with Down syndrome - a comparative study**

<http://www.down-syndrome.org/reports/1999/>

10. **Research and references that support orthodontic treatment procedures in the 4-7-year-old child**

<http://perfectstart.com/how-it-works/supporting-research/>

11. <http://orthotropics.com/>

Please also see the **PDF Slide Presentation by James Bieneman, D.D.S. (attached)**