[1]应用暂时性语音矫治器治疗腭咽闭合不全

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先天性腭裂是人类最常见的发音畸形之一，发病率较高，严重影响病人的发音及生活质量。多数病人仍然发音不清，即使经过语音训练仍有许多病人发音不能接近正常。主要原因是患者发音时存在腭咽闭合不全.本文对腭咽闭合不全的修复治疗进行讨论.

一、腭裂语音病理

语言的产生是在大脑语言中枢指挥下，由肺部呼出气流，经喉部声带，声道及共鸣腔，是三部分器官协调运动的结果。在正常语音产生过程中，软腭上抬与咽壁紧密的协调运动是咽腔与鼻腔完全分割,以维持口腔压力达到口腔-鼻腔共鸣平衡,从而发出正常语音。当发口腔辅音时，腭咽瓣关闭,使口腔获得足够的空气压力和气流. 当发元音时能得到口腔共振平衡。。腭裂语音是由唇腭裂异常解剖结构,造成腭咽闭合不全而产生。腭裂的语音特点主要有四个方面：①声音共振异常,在发音过程中气流同时进入口腔与鼻腔,在口腔与鼻腔同时共鸣二产生异常语音,高鼻音;②鼻漏气;③口辅音压力减弱;④代偿发音。所以对腭裂语音的矫治也应针对以上四个方面进行。

二. 腭咽闭合不全（VPI）

腭裂术后大约一半左右病人,发音时达到腭咽闭合.在此基础上如能继续接受语言训练及矫正不良发音习惯,有可能恢复正常语音功能.但是约 1/2~1/3 病人由于局部解剖及功能上的先天性缺陷,在单纯手术后其形状与肌肉的位置分布,肌肉的收缩功能均难达到正常从而造成腭咽功能不全.另外手术者的技巧,术式,术后瘢痕均可影响软腭活动造成软腭闭合不全.发音时一部分气体漏入鼻腔,造成口腔内压力不足.同时,漏入鼻腔的气体在鼻腔产生共鸣.从而出现典型的腭裂语音-高鼻音.对于腭咽闭合不全治疗有多种方法如：二次手术、语音训练、修复治疗，等等。本人重点讲述关于腭咽闭合不全的修复治疗。

三.应用暂时性语音矫治器治疗腭咽闭合不全

(一)原理

腭裂治疗的目的是关闭裂隙、重建腭咽闭合，最终达到正常发音。手术关闭裂隙重建腭咽闭合功能是获得正常发音的基础和前提。腭裂术后能达到完全腭咽闭合的患者平均 66%左右。对于腭咽闭会不全（velopharyngeal incompetence，VPI）患者暂不行 II 期手术或行 II 期手术前后几乎可以接受暂时性语音矫治器，即咽阻塞器（obturator）的治疗。通过腭咽阻塞器等序列治疗，其腭咽闭合功能明显改善，甚至 30%患者取出阻塞器后 VPI 已完全改善，

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因此，这是治疗腭裂术后 VPI 及建立发音基础较好的非手术方法。

语音矫治器是用牙科自凝塑料制作的修复体，对治疗起关键作用的是阻塞腭后孔的球状阻塞体。当矫治器戴入口腔时。球状阻塞体应位于软腭平面上、腭咽闭合孔的中央。其作用机理是：堵塞发音时口鼻间不正常的通气道，以达到暂时性腭咽闭合，并同时刺激腭咽肌肉收缩，逐渐增强腭咽肌肉的功能，以期达到功能性腭咽闭合并使口腔具备正常气压，以便形成正常口腔发音习惯，并给语音训练及纠正不良发音习惯创造一个良好条件。在发音时，球状阻塞体周缘同时与运动的咽侧壁、后壁及上抬的软腭接触。完全阻塞腭咽闭合所遗留的漏气孔。不发音时。气流可经过球状阻塞体与腭咽结构间的间隙自由通过，保证正常的鼻呼吸和不造成过低鼻音。当矫治器阻止了发音时的鼻漏气时，就需配合语音治疗。通过以上治疗，语音已达到正常或接近正常时，器可分阶段地逐渐减小，以刺激腭咽部功能的进一步代偿。每 3~4 月缩小一次，直至最后取出阻塞器而不发生 VPI，这是产生了具有完全补偿功能的腭咽肌肉 ,使腭裂术后达到接近正常的口腔发音环境.为正确发音创造条件

(二)暂时性语音矫治器的结构

主要有三部分组成

1. 前部:硬腭腭托,具有固定功能的树脂板。
2. 中部:连接杆,为连接前后两部的不锈钢丝.
3. 后部:阻塞球,为一塑脂球,载入口腔时,此球位于腭咽孔部位,发音时阻塞腭咽闭合不全的漏气孔.静止时气流可以从周围自由通过.

(三)语音矫治器制作方法

1. 取上颌模型.
2. 模型制作:一般在双侧磨牙上设计连续卡环,成人在 76⊥67, 儿童在ⅤⅣ┬ⅣⅤ, 个别固位力差者可加固位卡环;
3. 制作腭托:用甲基丙烯酸甲酯按一般腭托制作方法制作腭托;试戴 1-2 周;
4. 制作连接杆：口内测量腭托后界至腭后壁距离, 与相当于中线位置, 用 0.9mm 直径钢丝 2 根作为连接杆。
5. 制作阻塞球：根据鼻咽镜检查腭咽孔大小形状, 在远端用自凝甲基丙烯酸甲酯制作阻塞球, 小球由小逐渐加大, 以至足够大, 能在发音时阻塞球与腭咽部组织少许接触完全阻塞腭咽孔, 而不发音时气流可自由通过, 不影响患者呼吸, 及造成其他不适. 小球一般位于悬雍垂上方, 相当于硬腭延伸平面.

(三) 语音矫治器制作注意事项

目的使患儿戴阻塞器舒适, 无恶心, 不给患儿带来其他不良伤害或反应, 从而能主动配合

治疗.

1. 取模时不使患儿恶心及反感
2. 制作阻塞器的连接杆必须紧贴软腭并将其抬高 1mm
3. 固为良好.
4. 硬腭区腭板不要太厚,尤其在切牙区不要太厚,因大约 85%辅音在此发生.
5. 对戴后疼痛及明显不适者要及时检查,防止造成局部压迫型溃疡

(四)腭咽阻塞器的应用

1. 白天戴入口中,夜间放入水中,以保持其不变性.
2. 戴入 3-4 月复诊一次最好在鼻咽镜下检查(令患儿讲 1-100 数字;早晨空气好,蹦蹦跳跳,身体好;我想吃冰糖,可是哥哥不让吃;他去无锡市,我到黑龙江)观察腭咽闭合与阻塞器小球协调情况. 小球上涂一层白色显示膏或牙膏显示阻塞器那些部分和鼻咽部或软腭后仍接触过紧,磨去过紧部分,如有漏气部分应添加塑料.
3. 戴矫治器的过程中卡环过松,或有部位摩擦疼痛应及时来医院或请当地牙医修改.
4. 戴矫治器后 6 个月请患儿家长密切注意观察患儿每次取下矫治器前后的变化. 如家长发现戴矫治器与不戴矫治器一样时,经过医院检查证实后,暂时停戴 1-2 周,或每次周末停戴. 如果不出现腭裂语音可以停戴阻塞器 1 月. 此时仍将矫治器放在水中以保持其大小及持久性 . 如语音变化不大可永久摘除阻塞器.,若摘下阻塞器后出现高鼻音仍需继续戴阻塞器.
5. 在医师指导下,父母帮助保持矫治器清洁及口腔卫生,防止因戴矫治器造成龋齿或口腔不洁.
6. 应用矫治器治疗的关键在于患儿合作与家长配合,如能坚持一定能取得良好效果.

(六)暂时性语音矫治器临床评价

1. 暂时性语音矫治器可以使腭裂术后腭咽闭合不全患儿达到暂时性腭咽闭合,从而形成了具有正常明显压力的发音环境,利于腭裂患儿正常发音及矫正不良发音习惯.
2. 戴矫治器及时请专家进行语音训练及矫正不良发音习惯,因阻塞器仅仅是创造了一个暂时性发音的腭咽闭合的环境,为正常发音创造了一个良好的条件,但必须改正不良发音习惯,及请专家讲授正常的发音方法,方能发出正常音来.
3. 早期戴矫治器每3-4月复诊一次. 根据临床检查与壁眼睛检查结果,调改组塞器小球,通过对腭咽周围组织的刺激,促使其收缩,缩小咽腔. 相应缩小小球. 缩小小球是通过视觉与听觉指征进行.
4. 当矫治器后部阻塞体缩小到一定程度,患儿家长及医师判断戴矫治器与摘下矫

治器发音相同(一般 2-3). 可停戴矫治器观察一个月, 若仍有高鼻音, 可在戴上, 若发音基本正常可永久停戴. 如果 3 年后仍不能摘下矫治器, 如家长同意手术, 可考虑II次手术, 作咽后壁组织瓣或其他缩小咽腔手术, 此时由于戴矫治器, 患儿具有了正常语音和明显腭咽部肌肉的代偿, 肌肉收缩功能大大加强. 为二次手术创造了良好的条件. 个别病人也可以永久戴矫治器.

5. 临床实践中发现儿童似乎对各种矫治器比成人适应更快,更满意.但是儿童有时不合作,应当耐心争取儿童配合,年长儿童自尊心强,主动配合.但由于不良发音习惯已形成,适应力也差, 故语音矫治时间往往延长.

.通过 5 年的临床实践,我们采用暂时性语音矫治器治疗腭裂术后腭咽闭合不全患儿 200 例,收到良好效果,100%语音得到改正,30~40%摘除矫治器后语音基本正常.我们通常对每个腭裂患儿进行术后 3~6 月复诊.如发现有腭咽闭合不全即制作语音矫治器治疗腭咽闭合不全.同时在寒暑假举办 2 次语音学习班.学习班要求患儿与家长一起来参加.一方面检查矫治器及监测语音,一方面采用集中训练与个别指导相结合方式纠正不良发音习惯与教患儿正常汉语语音.从而取得良好效果,我们认为语音矫治器是一种保守治疗腭裂术后腭咽闭合不全的好方法.

Prosthetic treatment of VP function

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Cleft lip and palate is a common congenial deformity. It affects speech and life quality of the patients. There still are disorders of speech in many patients after operation. The velopharyngeal incompetence is the main reason. The paper is written to discuss about prothesis treatment of VP function.

Speech of Pathology of cleft palate

Speech production is an intricate process. In the process, the airflow that passes the glottis, and the vocal tract results in the acoustic output. To pronounce correctly, enough air pressure is required in the oral cavity. And the complete velopharygneal closure is the prerequisite for pronunciation. But velopharyngeal incompetence still exits in 1/3 of children with cleft palate after operation. Articulation of cleft palate has four characteristics1.hypernasalty: Under velopherangeal incompetence, a lot of air goes into nose, and causes a resonance in oral cavity and nasal cavity spontaneously. 2.nasal emission 3.decrese of oral cavity pressure 4.compensative articulation. To evaluate and treat the palatalized phonation, the clinician should make a treatment plan to confront these four aspects.

VPI

After operation, about 60% of child with cleft palate achieves complete closure of VP. With speech training and behavioral therapy, it is possible that the VP function of the patients post-operatively can develop to normal. But about 40% patient still has VPI. Many factors may cause VPI, for example congenital defect of anatomy and function in palate muscles, technique and method of surgery, etc. many methods may treat VPI.
The focus is about using prothetic treatment of VP function in the paper.

Temporary speech prothesis

1. Principle

Temporary speech prothesis is one of good appliance for VPI, especially for patients who want not to do the second operation or before the second operation.

A temporary obturator is an acrylic prothesis, with a small bulb on its end, and it contributes the most of role to patient. The bulb is located at the center of hole of VP. It can block the airflow tract between oral cavity and nasal cavity so as to achieve temporary closure of VP. At the same time the bulb may stimulate surrounding muscles. So these muscles become more and more stronger.

The temporary VP closure is a prerequisite of stopping compensatory articulation and speech therapy. When patient is speaking, the periphery of bulb will be attached to the moving VP wall and

the hole of VPI. When patient is quieting, air may go through the leak between the bulb and pharyngeal wall, which can insure the normal nasal breathing and avoid hyponasalty. As the speech is normal or approximately normal, the bulb is to be reduced in size, step by step, so that it can further stimulate pharyngeal muscles and improve the compensatory of VP function. Generally, the patients should be checked every 3~4 months interval. And the bulb should to be reduced according to the result of exam of nasoendoscopy. When it is determined that VPI will not occur without obtuator, complete compensation of VP muscles is established because it sets up good circumstances for correct articulation.

Structure of appliance

This appliance involves the following three parts

1. Anterior part: an acrylic thin plate which attaches hard palate.
2. Middle part: connecting rod, which links the anterior part and the posterior part.
3. Posterior part: bulb made from acrylic resin. When the appliance is worn into oral cavity, the bulb is located at the center of VP hole.

Manufacturing methods

1. Get model of maxillar
2. design: to design circumferential clasp attached to 76|67 or V Ⅳ |Ⅳ V. Some children need a more clasp.
3. Make palate plate: it is similar to the method of

about 1~2 weeks.

4. To make a connecting rod: the rod is made of 0.9mm two sticks of wires. The length is from posterior margin of palate to uvula.
5. According to nasoendoscopy pictures of the shape and size of VP hole, to make the bulb, clinician may add more acrylic the bulb little by little to fit the VP hole. When the obturator is large enough, the air leak accompanying sound in the nose will notably decrease or stop. It should not affect patient's breathing or cause other uncomfortable.

Points for attention

Be sure that patients feel comfortable with no nausea when they wear it and that the appliance will do no harm to patients' health and development. Be sure that the patients can cooperate with the clinicians.

1. No nausea or opposition from patient when clinician makes the model of maxillar.
2. Be sure that the connection bar tightly attached to soft palate and elevates soft palate 1mm.
3. Good fixation.
4. The palate plate should be thin, especially at the incisor area because 85% of consonants occur in this area.
5. If patient feel uncomfortable or hurtful, he (or she) must go to see a doctor or a dentist, when wearing obturator.

Directions of using obturator

take it off and put it in water at night, which can maintain the original shape.

2. Patients have to go back to hospital every 3~4 months interval. The doctor will assess VP function and modify the bulb with nasoendoscopy.
3. As the patients achieve normal voice quality and proceeds with proper articulation, the clinician should pay attention to the changes after using it about 6 months. If the speech becomes normal, it usually indicates that there should be a treatment break at weekend, even for one month. If speech disorders still appear, patients should wear it again.
4. To prevent caries and bad hygiene, parents may help children keep the obturater clean under the directions.
5. Many patients referred for consistent application apparently have adequate potential for appropriate VP function if children (parents) and clinicians cooperate closely

Assessment

1. After obtaining temporary closure of VP with this appliance, patient should go to see a speech pathologist timely to correct the articulation.
2. According to nasoendoscopy examination, abturator are usually worn and reduced every 3~4 months.
3. obturaters are usually worn ,and reduced ,over 1 to 3 years. When it is determined that an obturator

successful removed, the patient is referred for a surgical substitute so that the temporary speech appliance can be discarded.

4. Through clinic practice, we found that children seem have a better adaptation and prognosis than adults'. But clinician should understand that children who are not co-operative well need more patience.

Study of and experience with temporary obturator for 8 years at the affiliated hospital of Qingdao university has indicated that obturator can be reduced considerably in size and even successfully removal without subsequent surgery. During one extended time period, 40% the patients wearing obturator had the bulb reduced to the point of successful removal without altering their oral-nasal resonance. The number of patients wearing temporary obturator in the affiliated hospital of Qingdao university is about 200 .