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Management of anterior open bite in a child with neurogenic bladder: A case report

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Abstract
The management of children with neurogenic bladder demands a multidisciplinary team approach because of the diversity of problems created by the condition. These children are often at high risk of developing infections due to the chronic use of catheters. Since these children are unable to control their bladder and are prone for allergy to latex, a good knowledge regarding the condition is important. Oral rehabilitation can be defined in terms of the restoration of function and aesthetics. Improving dental health can help in improving the quality of life in these children. This case report describes the management of anterior open bite in an 8-year-old boy diagnosed with neurogenic bladder.

Keywords: Dental management, habit breaking, neurogenic bladder, palatal crib

Introduction
Micturition process is controlled by the central nervous system and its dysfunction can be due to any defects in the micturition system which causes inability of the urinary sphincter to appropriately increase/decrease its pressure. The central nervous system coordinates the sympathetic and parasympathetic nervous system with the somatic nervous system. It ensures normal micturition with urinary continence. Voiding dysfunction can be due to any mechanical or physiologic defects in the micturition system. This results in the inability of the urinary sphincter to appropriately increase (or decrease) its pressure in response to increased bladder pressure. Damage or diseases of the central, peripheral, and autonomic nervous systems may result in neurogenic bladder dysfunction which results in reduced awareness of bladder fullness and a low-capacity bladder [1].
A habit is a repetitive action that is repeatedly performed and being done automatically [2]. An anterior open bite can be caused due to simple tongue thrusting and tongue crib can be used in its correction which changes the resting position of the tongue and thus allowing closure of an anterior open bite [3]. The present article describes the management of anterior open bite in a child having neurogenic bladder.

Case Presentation
An eight-year-old male patient diagnosed with neurogenic bladder had visited our department with the chief complaint of pain in the upper left back tooth region. Intraoral clinical examination revealed endodontically treated maxillary and mandibular primary molars, unerupted permanent maxillary lateral incisor and mandibular permanent canines and erupting maxillary premolars. There was a dislodged restoration with respect to mandibular left primary molar. On further examination, anterior open bite was seen with simple tongue thrusting habit. As he had no sucking habits, the anterior open bite was solely because of his abnormal tongue posture. Hence, a fixed palatal crib was planned for the patient.
On taking medical history, the patient reported that, at six months of age, vesicotomy was done, which was followed by closure and appendicular mitrofanoff procedure at the age of three years. The patient has to undergo emptying of urinary bladder every hour. As per the medical history, he was under the continuous use of oxybutynin, which is a urinary antispasmodic agent. In the first dental visit, oral hygiene instructions were given. Re-restoration of mandibular left primary molar with glass ionomer cement, application of pit and fissure sealants on permanent molar teeth were done and orthopantomography was advised.

The patient was referred to a general physician for opinion regarding the fitness for invasive oral surgical procedures. After obtaining the consent from the physician and the guardians, extraction of maxillary and mandibular molar teeth was done under 2% lignocaine local anaesthetic solution with 1:80000 adrenaline in the following two visits.

In the third visit, banding of maxillary permanent first molars were carried out with preformed stainless-steel bands, following which alginate impressions of the arches were taken. A fixed palatal crib using a 0.036" stainless steel wire, extending up to the lingual gingival margins of the mandibular incisors and transversely from canine to canine was fabricated on the cast and delivered. Every appointment lasted for only 30 minutes and reducing the clinical chair time was important for the clinical success because of patient's frequent need to urinate.

The patient was followed up every month for 8 months, following which, the appliance was detached and checked for the tongue position and swallowing pattern. Clinically the patient showed changes in his swallowing from an infantile to mature pattern.

Pre-Operative Photographs

Intraoperative Photographs

Six Months Follow Up

Discussion

Since the medical problems present in individuals with special health care needs are demanding, patients and their families do not consider oral health care as a priority and neglect oral hygiene. Hence the prevalence of unmet dental care needs is found higher among them [4]. Oral homecare and dental treatment of special needs individuals are usually complicated by a combination of factors that include neuromotor deficiencies, intellectual deficit, severe orthopaedic problems and gag reflex [5]. Oral rehabilitation becomes necessary as they help in improving the quality of life among these individuals.

The patient belongs to a low-income and poorly educated family, who had very little information on dental diseases and oral health care which limited the access to oro-dental care. Although neurogenic bladder is commonly associated with

other conditions like myelomeningocele and spinal dysraphism, in this case, the patient presented with only urinary incontinence [6] In chronically catheterized patients diagnosed with urogenital abnormalities, latex allergy is a common finding [7-8]. In dental setup, latex containing dental products are widely used that may induce allergic reactions. Latex gloves are the most obvious cause of allergic reactions and other items such as rubber dams and radiograph packets could also be the etiologic agent for triggering allergic reactions [5]. There was no history of latex allergy reported by the patient. One of the challenges in the treatment of this patient was his inability to control urination for a prolonged period, which is a symptom associated with the neurogenic bladder. Hence, short and multiple visits were held for the completion of dental treatment.

The lower urinary tract performs two main functions, namely the storage of urine at low pressures without leakage and the voiding of urine at appropriate intervals which are controlled by complex mechanisms involving all levels of the nervous system [10, 11]. Disruption of the bladder storage phase leads to increase in urinary frequency, urgency and urge incontinence. [11, 12] The patient presented with only neurogenic bladder due to high pressure. Urinary retention with high pressures in the bladder damages the kidneys and the bladder volume is usually smaller than normal due to increased muscle tone in the bladder.

Since NSAIDs cause inhibition of prostaglandins, dental professionals should be aware of the medications while prescribing to these patients after the dental procedure [12]. The patient was prescribed with paracetamol 325mg after performing the extractions.

The most important consideration for the correction of the tongue thrusting habit is to redirect the tongue's resting position. So, to effectively manage this, fixed palatal crib is a good treatment modality. Thus, both the crib design and duration of the treatment are two important considerations for success [13]. A palatal crib corrects an anterior open bite as it prevents the tongue to rest onto the teeth. The designing of the crib be such that it should extend far enough inferiorly to keep the tongue from positioning itself below the crib.

Therefore, the dental professionals who treat children with neurogenic bladder should be familiar with the associated problems of this condition.

A dental professional can bring about a positive change in alleviating the pain, discomfort, and sufferings of these children with aggressive preventive interventions and management of oral problems. Oral rehabilitation can be provided using an integrated multidisciplinary approach. and is often neglected in children with special care needs [14, 15]. Hence there is a need to increase the awareness among the community with this regard. Individuals with this condition should be provided dental treatment that is more comfortable and less fatiguing.

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