

THE ORTHODONTIC TREATMENT OF PATIENT WITH SPECIAL NEEDS-CONSIDERATIONS, MODALITIES AND MANAGEMENT

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ABSTRACT

A special needs child is an individual who has been determined to require special attention and specific necessities that other children do not. The prevalence of malocclusion is higher in these patients but they usually are denied of treatment for their physical and developmental disabilities. Orthodontic treatment can provide significant esthetic and functional benefits to affected individual which contributes greatly to individual's self esteem and lead to significant improvement in well being. However there are some important considerations while planning and providing orthodontic care to children with special needs. Orthodontic treatment plan should be individualized and developed keeping the child's strengths and weakness insight.

KEY WORDS

Special child, Talon's cusp, class II Div I, Hygiene maintenance.

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INTRODUCTION

Special needs children are the ones with any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity. Health care for individuals with special needs requires specialized knowledge, as well as increased awareness and attention, adaptation, and accommodative measures beyond what are considered routine¹. The prevalence and severity of malocclusion is high in such patients and so does the need for orthodontic treatment. In modern days the parents are highly motivated to improve the children's quality of life, by improving the appearance and the oral function, and their acceptance in society, but they are also the least likely to receive orthodontic treatment because of their nature of disability and orthodontics is still considered to be elective treatment for them².

Special consideration for orthodontic treatment of the special needs children:

Selection criterias for patients with disabilities who can be considered as candidates for orthodontic treatment as listed by Chadwick-Mcclade, modified by María, Abeleira, Outumuro, et al 3, are-

- Associated Medical condition and its severity,
- Malocclusion
- Aesthetic assessment
- Parent/carer commitment
- Child's tolerance to treatment
- Oral hygiene
- Risk/benefit ratio

1. The main goals of orthodontics are to improve the alignment and occlusion of the teeth and thus,

improve the function and indirectly the facial appearance². However in some cases its efficacy is limited and it cannot provide an ideal treatment plan for each cases .in these cases the treatment must be redirected towards more limited goals, more suited to the circumstances that the patient's condition dictates. Each child has his or her own achievable optimum, which needs to be assessed by the clinician, who must then apply treatment procedures appropriate for the child³.

2. Oral hygiene is the most crucial factor during orthodontic treatment and risk of iatrogenic damage in the forms of caries and gingival inflammation is high. The key is to educate the parents/caregivers as well as the child whenever possible regarding maintainance of oral health thoroughly, it should be made clear to the parents/caregivers that they must undertake the overall responsibility of achieving a mouth that is both cleaned regularly and that may become inflammation-free. This will generally mean that the parents/caregivers must brush the child's teeth, since the child may well not be able to reach the required standard alone. A further advantage of parental tooth brushing the value of which should not be underestimated, is that it accustoms the child to the insertion of foreign instruments (the toothbrush initially) into the mouth, by a person he or she trusts (the parent) and helps to overcome the child's defense reaction, apprehension, and, often, the gag reflex². This encourages the child to subsequently surrender control of the oral environment to professional intrusion into the oral cavity which is beneficial to the orthodontist.

3. Communication is vital for the education of our orthodontic special needs patients, since orthodontic treatment is a multivisit modality of extended duration among special needs children as they require more chairside time, and an increased number of appointments.

Technological innovations recommended for dental patients with disabilities is given by Becker and Shapira modified by María , Abeleira, Outumuro, et al for fixed orthodontic treatment³-

- a. Impressions using quick-set materials
- b. Easy bonding of brackets
- c. Use of Self-etching primer
- d. Advanced memory wires for less frequent visits
- e. Use of Self-ligating brackets

4. Fixed appliances are more difficult to place, because they require specific conditions, such as the need for the patient to sit still for long periods of time for precise positioning of the brackets and with complete dryness of the teeth. Uncontrolled limb and head movements and an inability to sit still-making it difficult even to seat the child in the dental chair. Adjustment of fixed appliances can involve unpleasant sensations of pressure caused by the introduction and manipulation of instruments within

the mouth.

5. For most of the routine visits for adjustment and checkup, the use of behavior management techniques, such as "Tell, Show, and Do," behavior modification and positive and negative reinforcement, is adequate to achieve the goals of the respective visits.

6. With simple explanation and good communication Impressions usually can be performed successfully but orthodontist should be aware of exaggerated gag reflex and increased incidence of drooling in the special needs child and accordingly, alternative adjunctive modalities must be used like mild day care sedation.

7. Radiographs like the panoramic view and cephalograms are most frequently used for the orthodontic assessment. Sometimes restricting a non-understanding and frightened child in a cephalostat or in a panoramic machine, will often increase their fear and even generate panic. In these patients alternative radiographic views like multiple periapical views might be useful².

CASE REPORT

A 12 years old female patient with mental retardation presented along with her apprehensive parents in the Department of Orthodontics in Dr. R Ahmed dental College and Hospital, Kolkata with complaint of forwardly placed upper front teeth. Parents were very much motivated about her orthodontic treatment need and patient was friendly and moderately cooperative. On extraoral examination she revealed a mesoprosopic facial form with convex profile, incompetent lips with interlabial distance of 8mm with hyperactive mental is activity. The clinical intraoral views show a Class II dental relationship, with increased overjet of 12mm and overbite of 6mm. Patient had severe generalized gingivitis with drooling of saliva from angle of the mouth.

Presence of Talon's cusp was noted in the right maxillary central incisor.

Cephalometric analysis showed SNA angle of 81 degrees , SNB 74 degrees and with Na perpendicular to point A being 14mm indicating a class II skeletal pattern.



FIG-1:TALON'S CUSP



FIG-2: PRE TREATMENT RADIOGRAPHS



FIG-3: PRE TREATMENT INTRAORAL AND EXTRAORAL PHOTOGRAPHS

DIAGNOSIS

Based on extraoral, intraoral and cephalometric examination she was diagnosed as Angle's skeletal class II Division 1 malocclusion on skeletal class II bases with average growth pattern, proclined upper anteriors, protrusive upper and lower lips, increased overjet and overbite with short upper lip and interlabial gap and convex profile.

Problem list:

- 1. **Skeletal problem :** Class II
- 2. **Dental problem:**
Proclined upper anterior teeth

Mild anterior generalized spacing
Increased overjet and overbite.

- 3. **Soft tissue problem:**
protrusive upper and lower lips
Shot upper lip
Interlabial gap of 8 mm.

TREATMENT OBJECTIVES

After assessment of patient's level of cooperation and internal motivation and parents expectation of treatment outcome, the treatment plan was modified according to patients level of tolerance -



FIG-4: POST TREATMENT EXTRAORAL AND INTRAORAL PHOTOGRAPHS



FIG-5: POSTTREATMENT ORTHOPANTOMOGRAM

1. to attain normal or near normal overjet and overbite.
2. closure of upper anterior spacing
3. improve the smile, aesthetics and overall appearance.

TREATMENT PLAN

Treatment plan was modified and chosen according to the patients convenience and parents expectation. The parents choose a less time consuming treatment plan which would require minimum compliance from patient's side. So although it was not "ideal", patient was planned to be

treated using fixed mechanotherapy using MBT 0.022 slot bracket after bilateral upper first premolars extraction, with the goal of reducing the overjet and overbite and subsequently reducing the anterior proclination.

TREATMENT PROGRESS

Upper first premolars were extracted followed by placement of trans palatal arch for anchorage.

Upper arch was bonded with moderate difficulty in two appointments as patient wasn't able to sit still for a long time. After 14 months of active treatment the retraction of anterior arch was completed and extraction space closed completely. Although the bite

was deep the parents and patient were satisfied with the result and choose to end the treatment. Post treatment OPG showed upper arch root parallelism was achieved.

After debonding patient was given a retainer with anterior bite plane for bite correction. Post treatment lateral cephalogram is not available due to non cooperation of the patient.

Post-treatment Satisfaction

Orthodontic treatment was beneficial for this patient as for this patient as it not only improved the facial/dental profiles, but also improvement in oral functions, the swallowing pattern, the related drooling, speech, and even mastication was reported by the parents at the end of the fixed treatment. the changes also resulted in associated improvements in esthetic self-satisfaction and self-confidence. She became confident with her smile and parents were happy after the results.

DISCUSSION

Previous reports have demonstrated an association of talon cusp with a number of syndromes including Mohr syndrome, Sturge-Weber syndrome, Rubinstein-Taybi syndrome, incontinentia pigmenti achromians, and Ellis-van Creveld syndrome⁵⁻⁶. Rubinstein-Taybi syndrome is a well-known disorder characterized by mental and growth retardation, broad thumbs and great toes, and unusual facial characteristics. However in this patient no definitive syndromic association was made.

During Orthodontic treatment presence of Talon's cusp may interfere with achievement of proper overjet and overbite. Management of Talon's cusp is necessary in these cases accordingly.

CONCLUSION

The aims of orthodontic treatment for patients with special needs must be modified from 'ideal'. The orthodontist should aim for an aesthetically acceptable and functional result, but not necessarily for orthodontic perfection³. Orthodontic treatment is

feasible in special needs children after careful patient selection, taking into account that success depends not only on obvious factors, such as the type and severity of malocclusion but also to the degree of patient cooperation, internal motivation and parents collaboration. The objective assessment of treatment success requires the application of tools that quantitatively evaluate improvements in the domains of aesthetic appearance, oral functionality and quality of life for that patient. This requires pragmatism and an ability to choose less conventional treatment plans at times⁴. and parents must be thoroughly informed to avoid inappropriate expectations.

REFERENCES

1. American Academy of Pediatric Dentistry. Definition of special health care needs. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2022:18.
2. Becker, Adrian & Shapira, Joseph & Chaushu, Stella. (2009). Orthodontic Treatment for the Special Needs Child. Progress in orthodontics. 10. 34-47. 10.1053/j.sodo.2004.09.009.
3. Abeleira, Maria & Outumuro, Mercedes & Diniz-Freitas, Márcio & Garcia-Caballero, Lucia & Diz Dios, Pedro & Limeres, Jacobo. (2016). Orthodontic Treatment in Children with Cerebral Palsy. 10.5772/64639.
4. Chadwick SM, Asher-McDade C. The orthodontic management of patients with profound learning disability. Br J Orthod. 1997 May;24(2):117-25. doi: 10.1093/ortho/24.2.117. PMID: 9218109.
5. Hattab FN, Yassin OM, al-Nimri KS. Talon cusp in permanent dentition associated with other dental anomalies: review of literature and report of seven cases. ASDC J Dent Child. 1996;63:368-376.
6. Chen RJ, Chen HS. Talon cusp in primary dentition. Oral Surg Oral Med Oral Pathol. 1986;62:67-72.

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