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RESEARCH ARTICLE

NON-EXTRACTION ORTHODONTIC MANAGEMENT OF CROWDING OF AN ADOLESCENT BOY-A CASE REPORT

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Abstract

Orthodontic management of crowded dental arches require creation of spaces through certain space gaining methods. Extraction of 1st premolars had been the primary method of gaining space till the beginning of 21'st century. This method has been tried to be avoided due to certain reasons such as typical dishing-in of face, re-opening of extraction spaces, longer duration of active orthodontic treatment etc. Recently, certain crowded situations can be managed successfully by means of mid-arch or whole-arch expansion, whole-arch distallization, proximal disking etc. This case report shows how a moderately crowded situation of a young boy can be managed by non-extraction method to reproduce presentable facial aesthetics and smile characteristics.

Introduction:-

Decision making in selection of proper space gaining method in management of crowding cases is an important job of an orthodontist. In severe crowding-proclination cases, where facial profile is badly affected, extraction of 1st premolars in upper arch is a straight forward treatment strategy. We need to think critically to select a suitable space gaining method in borderline cases, where crowding-proclination is mild to moderate and does not affect facial profile to a great extent. Early orthodontic treatment in such situations is advantageous as we can utilize E-space when treatment is commenced in late mixed dentition phase and in certain Class II situations where the upper molar can be distallized when treatment is started in early permanent dentition immediately after eruption of permanent 2nd molar tooth.

Case Report

A. Mukherjee, an 11 year old boy, reported in Dept. Of Orthodontics And Dentofacial Orthopaedics, NBDC&H in late mixed dentition phase with all permanent teeth except upper left 2nd deciduous molar. He had moderate crowding in both upper and lower anterior teeth, with retroclination of upper left central incisor and right lateral incisor teeth. There was closed bite, on right side both canine and molar relationship was class-II, whereas on left side there was retained 2nd deciduous molar with canines in class-II and molars in class-I relationship.

Study model analysis revealed space discrepancy of 5mm in upper arch and 6mm in lower arch. Considering the soft tissue profile and relationship between upper incisors and lips, non-extraction treatment with very simple mechanics was planned. Upper 1st pre-molars of both sides were fixed with Nance Button and upper right molar was distallized with a NiTi open coil spring. After attaining class-I relationship in right side, the upper first permanent molars on both sides were fixed with a transpalatal arch. The Lee-way space obtained in left side and the spaces gained by

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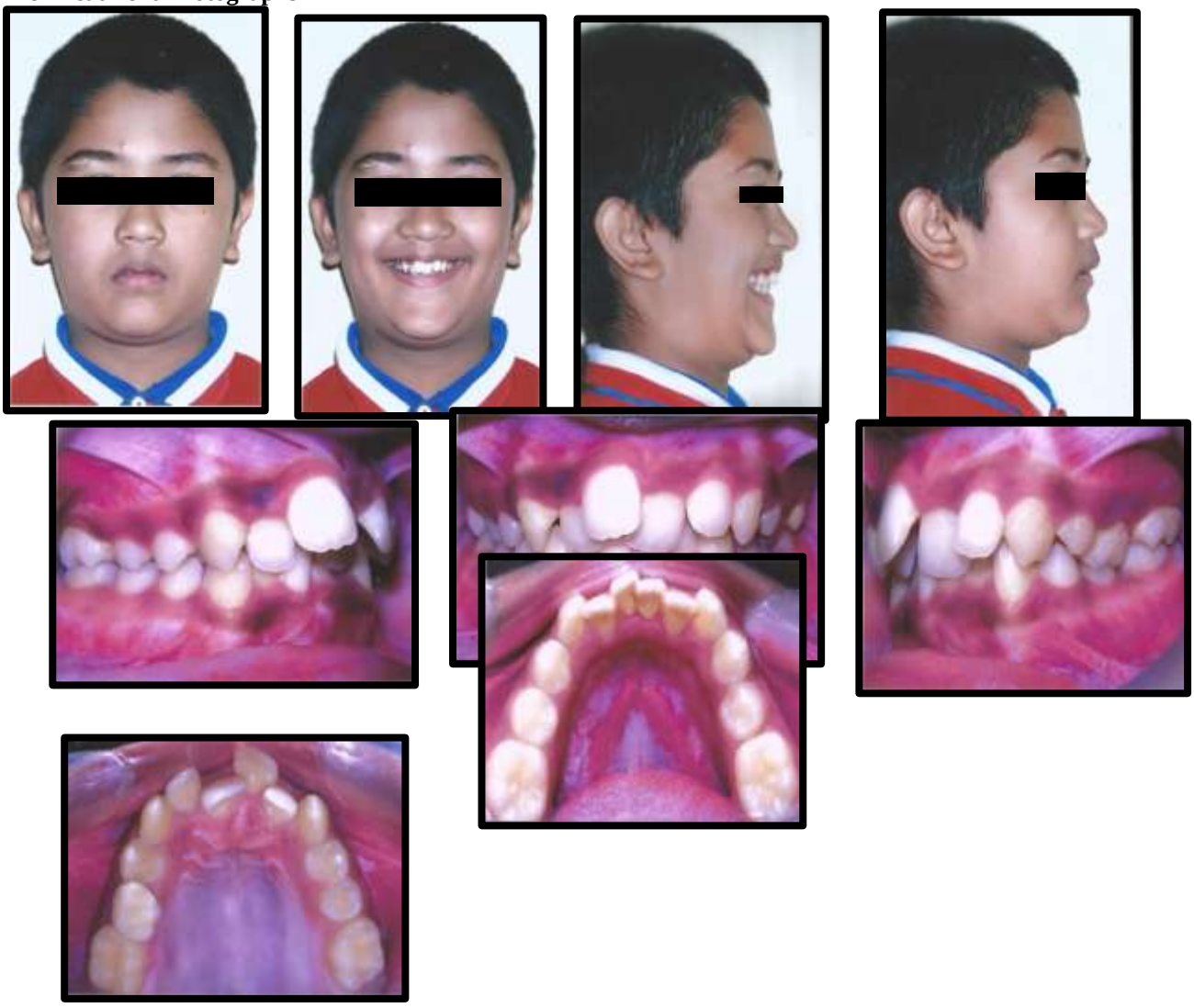
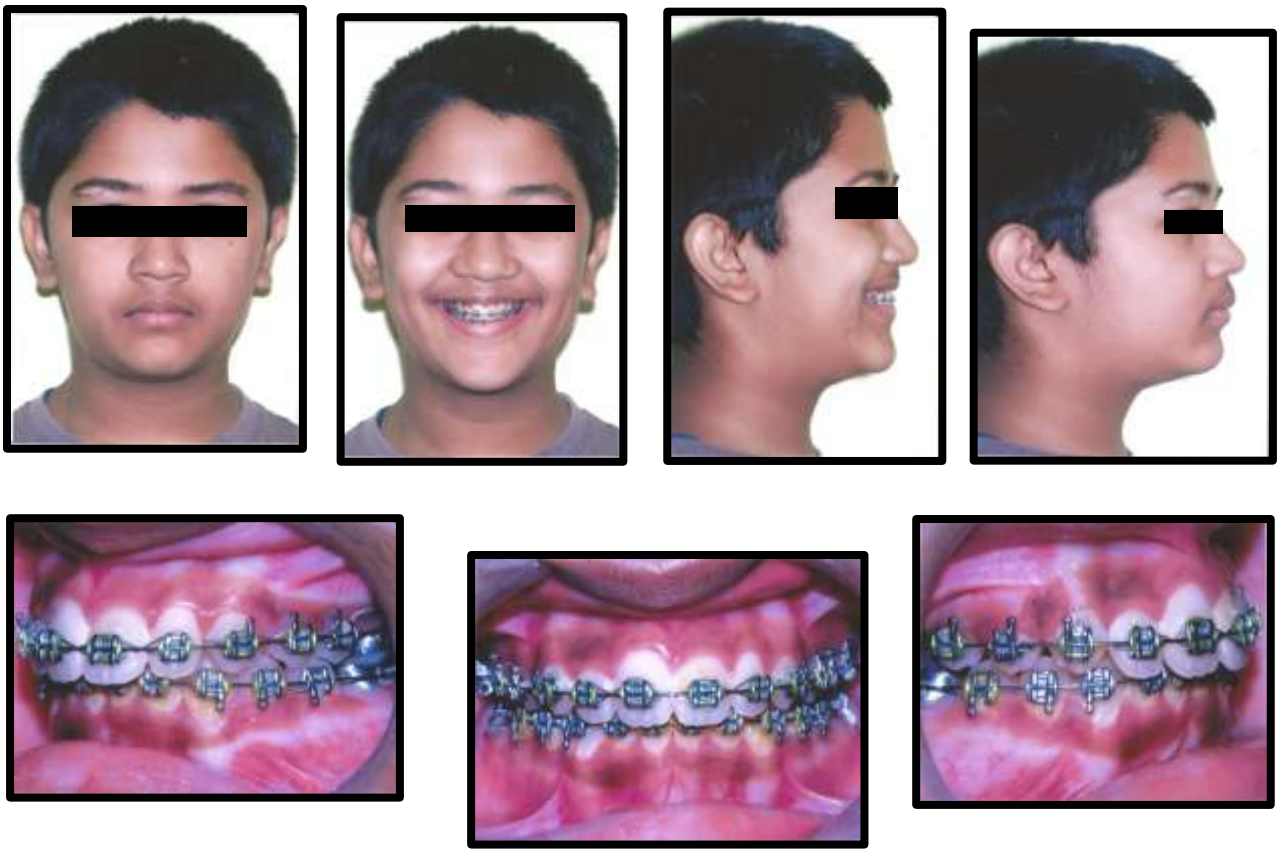
distallizing upper right molar tooth was utilized to alleviate crowding in upper arch. The lower arch was aligned and levelled starting with round NiTi wire and class-II elastics were advised after placement of full size SS wire. After achievement of class-I molar and canine relationship on both sides the occlusion was settled on 0.014 NiTi wires. Ultimately the teeth could have been arranged to fulfil all necessary occlusal and soft tissue parameters. The occlusion was retained with upper and lower fixed retainers along with upper Hawley retainer. The occlusal intercuspation and planned retention protocol assured long term stable occlusion.

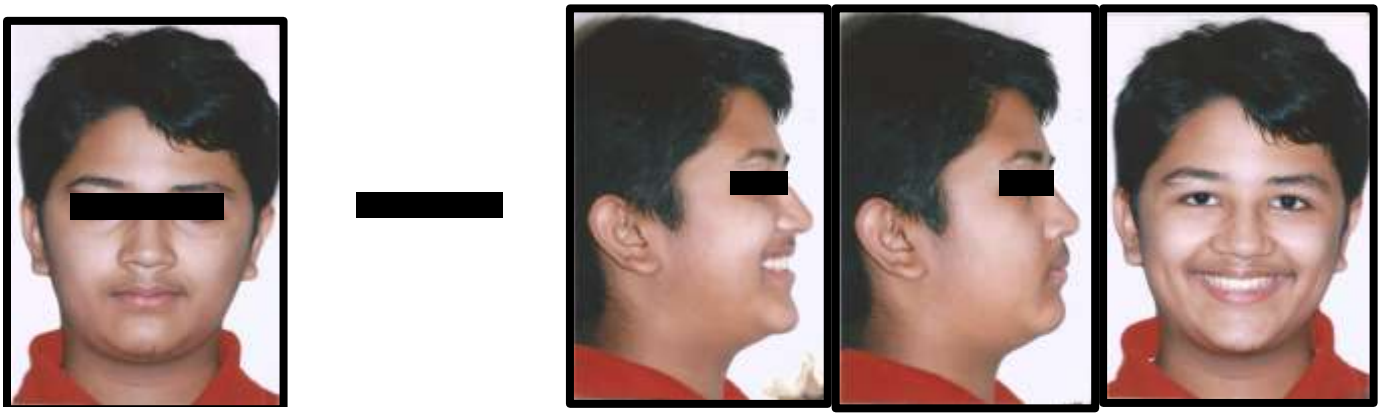
Pre-Treatment Photographs



In-Treatment Photographs With Braces



Post-Treatment Photographs



Discussion:-

Several orthodontic problems should be treated at an early age to prevent the necessity of future complex and extensive procedures. Literature and case reports suggest class-III cases as also some class-II malocclusions, crowding and open-bite cases can benefit from simple but efficient interceptive therapy.[1] Evidences show a short term of interceptive treatment with simple appliances can normalize anomalous growth, and the result of this treatment approach remain stable over time. Some of the advantages of early treatment are psychological improvement of the child, growth potential available at this stage of development, greater collaboration with treatment, a shorter 2nd phase of active treatment and the possible elimination of extraction in corrective phase.

Tooth size-arch length discrepancy and crowding is a frequent finding in early childhood.To avoid extraction of premolars in permanent dentition clinician will have to select procedures among distallization of molars, arch expansion, forward proclination of incisors or a serial extraction protocol.

The persisting claims that extraction of premolar in crowding cases cause dishing-in of faces had been sufficiently eradicated in the evidence based literature where it has been proved that extraction orthodontics does not negatively affect facial aesthetics provided indications of extraction was correct and extraction sites have been comprehensively managed. On the other hand a categoric rejection of extraction can lead to severe iatrogenic harm in both hard and soft tissue envelope in terms of provoking dehiscences, root resorption, gingival recession, lip procumbency and instability in many patients. [2 3]

However, there were several different efforts to prevent and correct crowding in children, though the certainity of evidence was very low.[4] Transpalatal arch in upper arch and lingual holding arch and lip-bumper in lower arch were found effective in maintaining space by increasing the arch length by around 3mm.

Moorees and Chada mentioned that about 4.3mm of space can be gained by preservation of Lee-way space.[5] They showed in their 100 patients' study, that the surest indication of future crowding in mixed dentition necessitating lingual holding arch is premature exfoliation of primary canines.

Regarding strategies implemented in mixed dentition, it is found that treatment option depends on amount of crowding. Moorees and Reed[6 7] studied 184 casts at age 3 years and observed till 16-17 years age. They found that in the mandible, an average of 1.6mm of crowding in boys and 1.8mm of crowding in girls at 3years will resolve by age 8years, by utilizing primate spaces. Venditteli and Hendler[8] suggest discing of mesial surfaces of deciduous canines and evaluation for placement of a lingual arch space maintainer before exfoliation of "E"s where crowding is 3-4mm. they suggest when amount of crowding is 4-7mm, extraction of "C"s and placement of a lingual holding arch is essential. Regarding expansion as an option to alleviate crowding in lower arch, Little RM, Riedel and Stein[9] mentioned that as expansion in lower arch is mostly dentoalveolar due to absence of a suture, increase in intercanine width of more than 1mm is unstable and hence not recommended.

Conclusion:-

It is the responsibility of an orthodontist to decide when and how to start management of crowding in mixed dentition period. Literature suggests crowding if not treated becomes worse after transition of dentition, so early treatment should be preferred. Treatment commencement should be judiciously timed as very early treatment may increase overall fixed appliance treatment tenure leading to patient burn-out, increased risk of decalcification and gingivitis and increase in cost. Evidences however suggest that crowding situations with or without skeletal discrepancy can be managed by early intervention, seeking help of Head-gears, Face-masks, space-maintainers, arch expanders, molar distallizers or by proximal slicing of certain deciduous teeth. This study is relevant and important as because more than 50% of child have crowding in mixed dentition.[8]

References:-

1. Very early orthodontic treatment:When,why and how? Ute E.M.Schneider-Moser and Lorenz Moser. Dental Press Journal Orthod 2022;27(2) e22spe2.
2. The esthetic impact of extraction and non-extraction treatment on Caucasian patients;
   Bowman SJ, Johnson LE, (jr)
   Angle orthod.2000;70(1):3-10
3. "Early vs Late Orthodontic Treatment of tooth crowding by first Premolar extraction- a systematic review." Lopes H, Filho, Maia LC, Angle orthod 2015 185(3)/:510-517.
4. Orthodontic treatment for crowded teeth in children. Sarah Turner, Jayne E Harrison, Fyeza NJ Sharif, Darren Owens, Declan T Millett, 31 Dec 2021. Cochrane database of systematic reviews.
5. Moorrees CFA, Chada JM. Available space for incisors during dental development. A growth study based on physiologic age. Angle orthod 1965;35:12-22.
6. Moorees CFA, The dentition of the growing child. Harvard university press, 1959.
7. Moorees CFA, Reed RB. Biometrics of crowding and spacing of the teeth in the mandible. Am J Phy. Anthop 1952; 12:77-88.
8. Diagnosis and treatment planning of mandibular crowding in the mixed dentition; Bruno L Venditteli and Tracey J. Hendler; Oral health journal 01/05/2017.
9. Little RM, Riedel RA and Stein A. Mandibular arch length increase during the mixed dentition; Post retention evaluation of stability and relapse. Am J Orthod Dentofacial Orthop:1990;97:393-404.