

Management of crowding of teeth : A case report

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Abstract : Crowding usually occurs as a result of disproportion between tooth size and arch length. A relative decrease in arch length or an increase in tooth material can result in crowding. Many etiological factors are responsible for development of crowding. The case report presented here discuss the orthodontic management of crowding of both upper and lower anterior teeth.

IndexTerms - arch length, etiological factors

I. INTRODUCTION

Crowding also termed as arch-length discrepancy is the excess of tooth material over the arch perimeter that accommodates them. Crowding could occur in the anterior, middle or posterior areas of the arch. The following are the some of the other causes of crowding.

Presence of supernumerary or extra tooth can result in a crowded arrangement of teeth. prolonged retention of deciduous teeth can result in abnormal location. Abnormalities in size and shape of teeth can lead to a crowded arch. Premature loss of a deciduous tooth invariably results in drifting of adjacent teeth into the extraction space. Late mandibular growth is responsible for late lower labial segment crowding.

Kharbanda et al¹ reported that Crowding in mandibular anterior teeth was the most common trait of malocclusion 11.7% in Delhi in India. There was no difference in the prevalence of malocclusion between males and females.

Visible crowding of erupted teeth is measured directly from the study model, mesial to the first permanent molar. For anterior and middle crowding, the individual mesio-distal width are measured using a calliper and added. This figure is then compared with the arch perimeter obtained by contouring a brass wire along the arch, which is then straightened to measure its length.

Crowding could also be estimated by measuring the overlap of the crowded teeth at every contact and adding them to find the total amount of crowding. Radiological pictures obviously play a very important role in the assessment of crowding when certain teeth are yet to erupt. During mixed dentition the leeway space in early stages and E space in late stages will have to be judged from the x-ray pictures. It also reveal if unerupted second and /or third molars are likely to have inadequate space leading to posterior crowding. Resolution of crowding during early mixed dentition can be done by serial extraction.

II. DIAGNOSIS :

A 13 yr old boy reported to the department of orthodontics and dentofacial orthopaedics at my Clinic with chief complain of irregular teeth and unpleasant smile.

Extraoral examination shows

- Dolicocephalic headform and leptoprosopic facial form.
- Lips are potentially competent with interlabial gap of 3mm
- Incisor display is 3mm at rest.
- Full incisal display with 1-2mm of gingiva at smile.
- Smile arc is non consonant.
- Increased lower anterior facial height.
- Posteriorly divergent face.
- No history of congenital diseases or anomaly recorded.

Intraoral examination

- Maxilla mandibular relationship shows class I molar and class I canine relationship.
- Overjet of 9mm.
- Overbite of 3mm.
- Curve of spee 2.5mm in both side.

Study model analysis – Carey' s analysis shows arch perimeter and total tooth material discrepancy of 8mm on maxillary arch and of 12mm on mandibular arch.

Bolton' s ratio shows 1.5mm of maxillary tooth material excess and 2.3mm of mandibular tooth material excess.

Ashley Howe's analysis indicates basal arch width 38.13%.

Cephalometric analysis revealed skeletal class I with ANB of 02 degree and FMA of 28 degree.

III. MANAGEMENT :

Treatment plan : Fixed mechanotherapy with preadjusted edgewise mechanics following MBT prescription. Extraction of first premolars in upper arch and second premolar in lower arch (because of altered morphology and greater mesio-distal width of lower second premolar). High anchorage required on both upper and lower arch. Transpalatal arch on upper arch (4-5mm) away from palate and lingual arch in lower arch was given.

Individual canine retraction with mushroom loop² done on upper arch. After that levelling and alignment of both upper and lower arch done with. 014, .016 niti, 17×25 niti, 19×25 niti. Closure of spaces by retraction of anteriors done on 19×25 ss wire.

Parameters	Pre- treatment	Post -treatment
SNA	80 degree	80 degree
SNB	78 degree	78degree
ANB	2 degree	2 degree
FMA	28degree	27degree
IMPA	99degree	95degree
I to NA	48degree/11mm	35degree/7mm
I to NB	30degree/9mm	27degree/ 4mm

IV. PRE- TREATMENT PHOTOGRAPH :



V. POST – TREATMENT PHOTOGRAPH :



VI. DISCUSSION :

Early detection and interception of crowding helps to manage crowding cases properly. Serial extraction procedure, more appropriately termed as eruption guidance is a major component of the comprehensive orthodontic treatment which lasts from early mixed dentition to permanent dentition when a phase of full banded fixed mechanotherapy of lesser duration is needed.

Most difficult part of the procedure is the decision to undertake this procedure. Serial extraction is used much less now than a generation ago, because it is hard to be absolutely certain that crowding in the early mixed dentition is severe enough to make the extraction decision at the time.³

On the other hand, data shows that in moderate crowding, starting treatment just at the end of the mixed dentition and maintaining leeway space facilitates nonextraction treatment.⁴ Here the case reported at the permanent dentition stage. Serial extraction at mixed dentition stage may help to reduce the severity of the crowding that he presented.

When degree of crowding is similar on both sides of the arch that is in case of symmetric crowding, superelastic wire with flat load deflection rate is ideal. But in case of asymmetric crowding, when all or nearly all the crowding is in one place, what is needed is an archwire that is rigid where the teeth is already aligned and quite springy where they are not.

Individualized retraction of canines with segmented closing loop reduce the strain on posterior anchorage.

VII. CONCLUSION :

Crowding of teeth is a very common malocclusion among population in India. Early detection and interception may reduce the period of fixed mechanotherapy. Moderate crowding can be resolved by arch expansion procedure. But severe crowding requires extraction of teeth either 1st or 2nd premolars to gain space for alignment of teeth. Management of crowding by orthodontic treatment enable development of normal dentition and a normal interarch relationship and thereby creating a balance between esthetic and function.

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