"Treat All with All" – A Multidisciplinary Approach for an Unusual Case Scenario

Pradeep Subbaiah[1], Dhakshayini M.R[2], Raghunath.N[3], Suma.Shekar[4], Bhgyalashmi Avinash[5], Nitin.V Muralidhar[5]

[1]Lecturer, Dept of Orthodontics, [2]Professor, Dept of Prosthodontic, [3]Professor & H.O.D, Dept of Orthodontics, [4]Reader, Dept of Oral Pathology, [5]Reader, Dept of Orthodontics, JSS Dental College and Hospital, JSSAHEr, Mysuru

Abstract

Impaction of teeth is more common and widespread. Multiple impacted permanent teeth are usually related to syndromes, metabolic and hormonal disorders. However, in non-syndromic cases impaction of multiple teeth is rare. In this report, a case of A 23-years-old male patient with missing upper front teeth and irregularly placed lower front teeth, difficulty in speech and mastication. physical examination was not suggestive of any syndromes. On Extraoral examination the patient presented with a concave profile, competent lips, shallow Mento-labial sulcus. On clinical and radiographic examination revealed Angle's class III malocclusion on class III skeletal base, with impacted 13,12,11 and 24, anterior cross bite, rotation of 32,33,35,42,44, and horizontal growth pattern. Extraction of supernumerary teeth was carried out in all the quadrants and PEA 0.22 ROTH appliance was used to align the arches. Bi-jaw surgery with mandibular set back with bilateral split sagittal osteotomy and maxillary advancement with Le Fort I was done to attain ideal overjet and overbite.

The objective of this report is to increase awareness of such cases especially in the absence of hereditary/ genetic/metabolic factors usually inherent in such scenarios. The patient management in such cases needs to be planned all with all multidisciplinary approach.

Key words *- multidisciplinary approach, unusual case, multiple impacted teeth, supernumerary teeth, class III skeletal, bi-jaw surgery.*

Introduction or Back Ground

An impacted tooth is a condition in which a tooth is embedded in the alveolus so that its eruption is prevented, or the tooth is locked in position by bone or by adjacent teeth. Studies have reported that the incidence of tooth impaction varies from 5.6-18.8% of population [1.] In our esthetic -conscious society, it is increasingly important to preserve the natural dentition. this certainly includes keeping or "saving" the impacted teeth. Impaction involving a single tooth is a commonly observable finding. However, impaction of multiple teeth is an uncommon finding unless associated with some syndromes or systemic disorders.[2,3] We report a case of multiple impacted permanent teeth in a non-syndromic unusual case scenario.

Pre-treatment assessment - A male patient of age 23 years on extra-oral examination presented with Dolichocephalic, Dolichofacial, concave profile, competent lips (figure-1A, 1B)

Corresponding author:
Dr. Pradeep Subbaiah
Lecturer, Dept of orthodontics, JSS Dental College and Hospital. JSSAHER, Mysuru.
Dr.pradeeps@jssuni.edu.in

Figure -1A EXTRAORAL SMILE

Figure- 1B EXTRAORAL LATERAL

Clinical examination intra-oral examination

1. Maxilla – U shaped, asymmetrical,22-palataly placed. 21,22- clinically missing. supernumerary teeth present between 16, 15 and 24,25

2. Mandible - U shaped, symmetrical. 32,42,44 mesiolingually rotated and 33,35 mesiolabially rotated.

3. Occlusal features – class III incisor relationship with negative overjet of 3 mm and overbite of 4 mm with anterior and posterior crossbite. (figure -2 A, 2 B, 2 C)

Figure 2 A INTRAORAL RIGHT

Figure 2 B INTRAORAL LEFT

Figure 2 C INTRAORAL FRONTAL

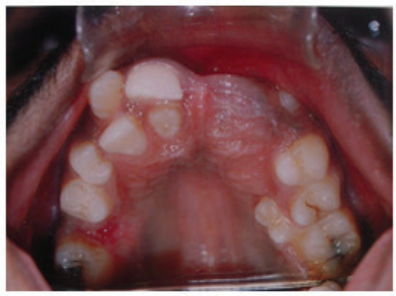

Figure 2 D INTRAORAL OCCLUSAL

Radiographic examination –

1. Dental panoramic radiograph (Fig 3) – unerupted teeth – 18,13,12,11,27,28,38,48.

2. Cephalometric analysis (Table1)-

VARIABLE	PRETREATMENT	NORMAL
SNA	78°	82° ± 3
SNB	86°	79° ± 3
ANB	-8°	3° ± 1
Wits appraisal	BO ahead by 7mm.	0 mm
N ⊥ Pt A	-7mm	0±2 mm
N ⊥Pog	7mm	0 to -4mm
Angle of inclination	88°	85
Go-Gn to SN	27°	32
Eff. Max. Length	87mm	89.6 ± 2.5
Eff. Mandi. Length	130mm	113.1 ± 3.6
Y- Axis	59°	66
Facial axis	0°	0
Upper incisor – NA(mm)	1mm	4mm
Upper incisor – NA(degrees)	15°	22
Upper incisor – SN	105°	102 ± 2
Upper incisor to maxillary plane angle	68°	70° ± 5
Lower incisor to mandibular plane angle	78°	92° ± 5
Lower incisor to NB	5mm	4mm
Lower incisor to NB	14°	25
Interincisal angle	147°	133° ± 10
Maxillary mandibular planes angle	19°	27° ± 5
Upper anterior face height	35%	45%
Lower anterior face height	65%	55%
Face height ratio	70%	62-65%
Lower incisor to APo line	5mm	1 -2 mm
Lower lip to Ricketts E Plane	4mm	-2 mm

Interpretation

- Retrognathic maxilla
- Prognathic mandible
- Skeletal class III
- Retroclined maxillary and mandibular incisors
- Horizontal growth pattern

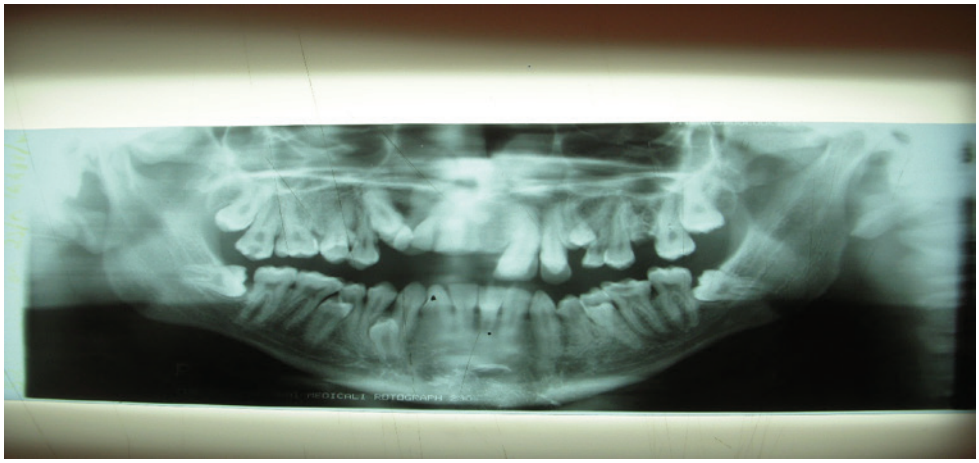

Figure -3 – PRETREATMENT OPG

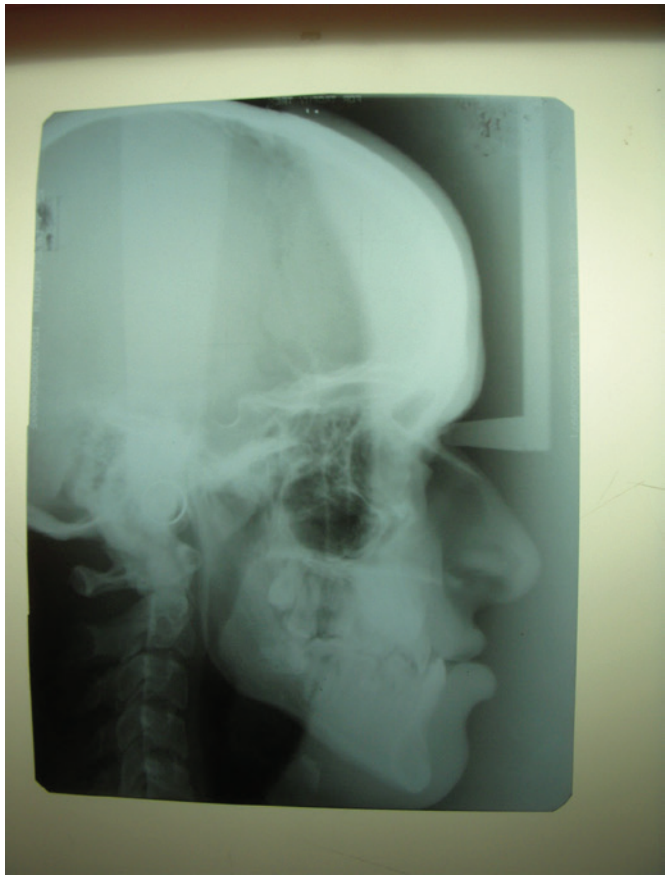

Figure – 4 PRETREATMENT LATERAL CEPHALOGRAM

DIAGNOSTIC SUMMARY

Angles class III malocclusion on class III skeletal base with impacted 11,12,13,24, anterior cross bite, rotation of 32,33,35,42,44 increased curve of spee and presence of supernumerary teeth

PROBLEM LIST

1. Impacted of 13,12,11, 24.
2. Speech problem
3. Masticatory dysfunction
4. Concave profile
5. Reverse overjet and overbite
6. Class III molar relation
7. Anterior and posterior crossbite.

Aims and Objectives of Treatment

1. Disimpaction of 13,12,11,24 and orthodontic eruption

2. To achieve an aesthetically pleasing profile

3. To correct skeletal Class III relationship

4. To achieve optimal overjet and overbite

6. To correct class III molar relationship

7. To relieve high frenum attachment

8. To achieve functionally stable occlusion

TREATMENT PLAN

Extractions:

Extraction of supernumerary teeth.

Appliances:

PEA roth-0.22 slot mechanotherapy

Special anchorage requirements:

None

Minor adjunctive surgery:

Frenectomy

Major adjunctive surgery:

BSSO mandibular set back

Maxillary advancement with LeFort I

Key Stages in Treatment Progress

	Date	Stage
1.	1 month	Banding and bonding in the upper arch on clinically erupted Surgical exposure of impacted 13,12,11 24 done in dept. of oral maxillo-facial surgery.
2.	2 months	Upper 0.16NiTi inserted soldered TPA given for reinforcing anchorage.
3.	3 month	Upper overlay wire made of 1mm S.S wire fabricated and inserted, and monkey hook were attached to 13,12,11,24 attachment overlay wire.
5.	6 month	Checkup done teeth responding favorably
6.	8 month	24 engaged to arch wire ,11-extruded mesially moved, 13 extruded.
7.	10 month	Overlay wire discontinued removable TPA given for 16 rotation correction. Upper 0.16 NiTi arch wire inserted and loosely engaged to 13,12,24. checkup done.
8.	11 month	11,24,25 0.22 ROTH bracket bonded, 0.16 NiTi arch wire engaged.

Cont... Table

9.	12 month	Checkup done advised extraction of 34 and supernumerary tooth present palated to 11.
10.	13 month	Lower anterior bonding and 36,46 banding done, lace back given canine to molar.0.16 NiTi arch wire inserted.
11.	16 month	Upper 0.016 NiTi and lower 0.014NiTi given
12.	20 month	Upper 16x22 NiTi and Lower-0.016NiTi given
13.	22 month	0.017 X 0.0 25 stainless steel arch wire was placed in the upper and lower arches.
14.	24 month	0.021 X 0.025 TMA wire placed in both upper and lower arches.0.021 X 0.025 stainless steel placed in the upper and lower arches. Surgical preparation done. Surgery and IMF done
15.	25 month	
16.	29 month	Post-surgical orthodontics in progress

Figure 5A- Mid Treatment Surgical exposure made of 1mm of impacted 13,12,11 24. PEA 022 ROTH bracket bonded.

Figure5B- Upper overlay wire S.S wire fabricated and 13,12,11,24 attachment inserted, and monkey hook was attached to overlay wire

Figure -5C- orthodontic surgical Extrusion

Figure-5D- maxillary occlusal view

Figure -5E- Mid treatment 0.20 S. S Continuous wire

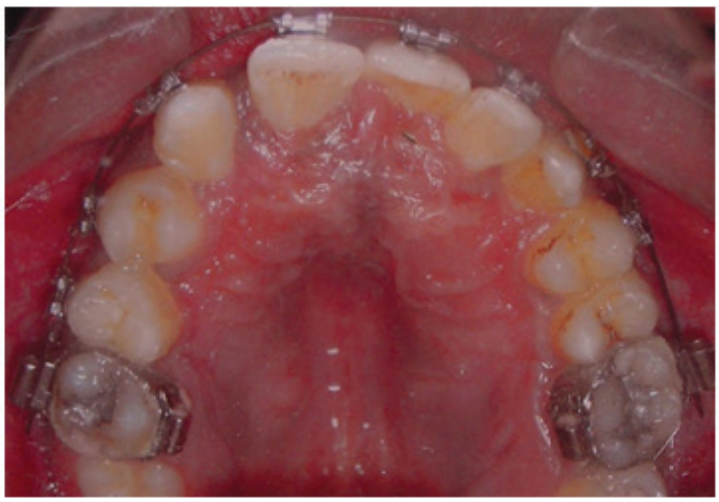

Figure -5F- maxillary occlusal view

Figure -6 – Mid treatment hanau face bow transfer

Figure -7- presurgical decompensation lateral cephalogram

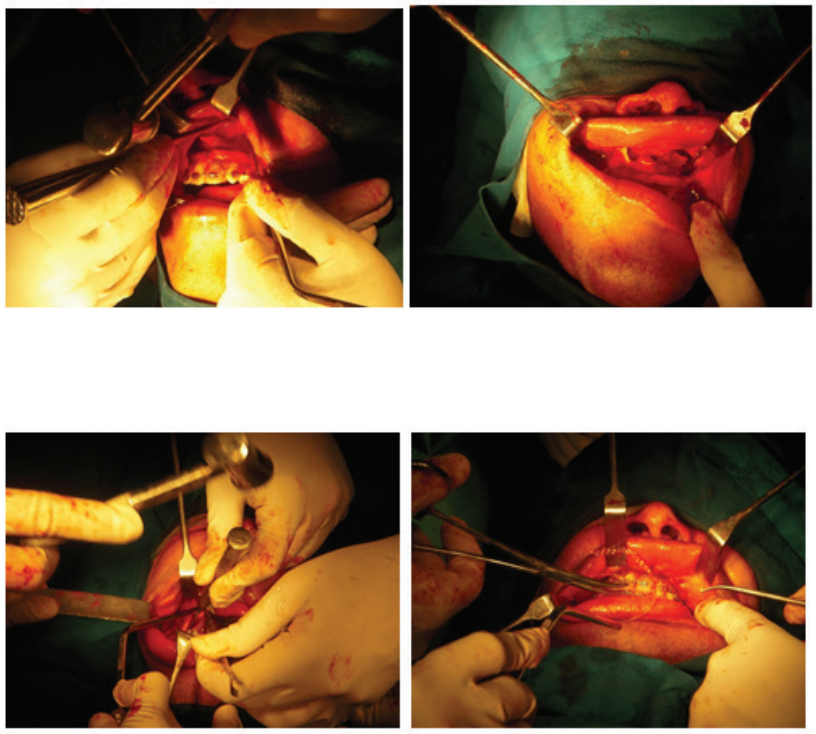

Figure 8- Surgical Procedure Down's Fracture / Lefort- I Osteotomy Maxillary Advancement & B.S.S.O Setback

FIGURE -9 POST SURGICAL TREATMENT – LATERAL CEPHLOMGRAM

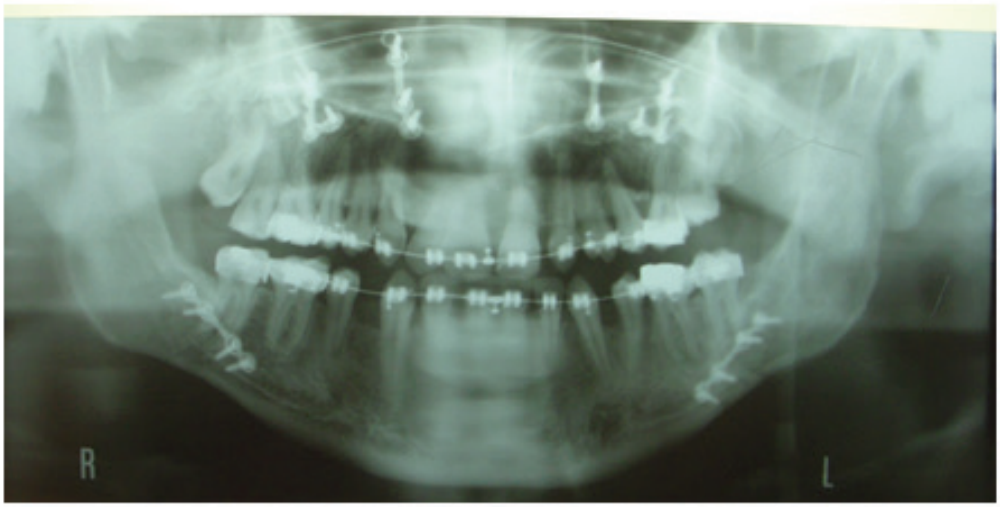

FIGURE -10-POST SURGICAL TREATMENT – OPG

FIGURE -11- POST SUGICAL EXTRA ORAL & INTRA ORAL PHOTOGRAPH

CEPHALOMETRIC ASSESSMENT- POST TREATMENT (Table – 3)

VARIABLE	MID TREATMENT	NORMAL
SNA		82° ± 3
SNB		79° ± 3
ANB		3° ± 1
Wits appraisal		0 mm
N ⊥ Pt A		0±2 mm
N ⊥Pog		0 to -4mm
Angle of inclination		85
Go-Gn to SN		32
Eff. Max. Length		89.6 ± 2.5
Eff. Mandi. Length		113.1 ± 3.6
Y- Axis		66
Facial axis		0
Upper incisor – NA		4mm
Upper incisor – NA		22
Upper incisor – SN		102 ± 2
Upper incisor to maxillary plane angle		108° ± 5
Lower incisor to mandibular plane angle		92° ± 5
Lower incisor to NB		4mm
Lower incisor to NB		25
Interincisal angle		133° ± 10
Maxillary mandibular planes angle		27° ± 5
Upper anterior face height		45%
Lower anterior face height		55%
Face height ratio		62-65%
Lower incisor to APo line		0-2 mm
Lower lip to Ricketts E Plane		-2 mm

Discussion

Keeping above problem list, aims and objective in mind, a decision to treat is made, treatment should be as minimal as needed to facilitate natural eruption. "The majority of impacted teeth erupt if hard – or soft -tissue obstructions are removed from their eruption paths". Di Biase conducted a survey, which found that after the removal of supernumerary teeth, 75 % of the impacted maxillary incisors spontaneously erupted.[4] so, first line of treatment planned was to remove supernumerary teeth followed by orthodontic relocation /surgical expose of impacted 13,12,11 24 done in dept. of oral maxillo-facial surgery at J.S.S DENTAL COLLEGE (figure 5A). Kokich and Mathews recommended surgical exposure and orthodontic eruption of an impacted tooth. when its apex is completely formed.[5] presurgical orthodontic is started after forced orthodontic eruption of impacted teeth. (Figure 5E and Figure 7).

Jaw relation registration of any positional relationship of the mandible relative to the maxilla is made by Hanau's face bow ear piece type used to record the spatial relationship of the maxillary arch to some anatomic reference points and then transfer this relationship to an articulator.[6](Figure-6). In the articulator the Lefort I maxillary advancement of 3 mm and hinge axis determines the arc of closure in every contacting position of the teeth. the path of closure is different from each open position of the mandible to tooth contact. This path results from the closing rotation combined with a gliding path of the axis.[7] and then mandible bilateral sagittal split osteotomy 6mm setback was made of the articulator, intermediate and final splint fabricated by using cold cure acrylic resin.

Presurgical orthodontic phase we eliminated the dental compensation that has occurred with respect to the skeletal base (Figure -7).

Surgical phase- Down's Fracture / Lefort- I Osteotomy Maxillary Advancement of 3mm & B.S.S.O 4mm Setback had done on mandible. (Figure-8). Post-surgical changes were appreciated by lateral cephalogram (Table-3) and OPG (Fig -10). Intraoral patients showed well settled occlusion with normal overjet and overbite (Fig-11).

Conclusion

Multiple impacted permanent teeth are rare condition and it is very difficult to find its association with syndromes, metabolic and hormonal disorders. HOWEVER, with this case report, a non-syndromic impaction of multiple teeth was managed orthodontically to improve the patient's masticatory and speech function which helped in a definite improvement in the profile of patient and in the occlusion. Mandibular prognathism and maxillary retrusion has been surgically corrected by BSSO mandibular set back and LE FORT I maxillary advancement. This Unusual Case Scenarios was managed with the concept of multidisciplinary approach I.e. "treat all with all".

Conflict of Interest – NIL

Source of Funding - Self

Ethical Clearance – patient consent was taken at the start of treatment. ethical approval is not taken form university because we treat lot of patient.

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