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Management of a mutilated orthodontic case through a multidisciplinary approach- a case report

Parag Gangurde[*], *Vaishali Vadgaonkar*, *Alok Shah*

Bharati Vidyapeeth Deemed University Dental College & Hospital, Sector 7, CBD Belapur, Navi Mumbai 400 614, India

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ABSTRACT

A female patient aged 35 years reported with mutilated occlusion with mid line shift, aggravation of skeletal Cl II with posterior cross bite on patient's right side. This was a case of Skeletal Class II Div 1 malocclusion which had been treated previously by other operator with extraction of all 1st premolars except in upper right quadrant. Multidisciplinary approach was taken to resolve all the problems as follows: mid line shift & cross bite were corrected by the orthodontist with application of "FORSUS: Fatigue Resistant Device", the odontome was eliminated by the oral surgeon, reconstruction of a premolar crown was done by the specialist in esthetic conservative dentistry & gingival grafting on a canine was done by the Periodontist. The objective of this presentation is to demonstrate the satisfactory outcome of the multidisciplinary approach in a mutiliated occlusion.[1,2]

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1. Case report

A poorly treated case with mutilation by another operator could cause difficulty in retreatment especially where it is accompanied with a left over pathological lesion like an odontome, cysts or gingival disease. Such a situation may need a multidisciplinary approach.

A 32 yr old married lady reported to department of orthodontics dissatisfied of previous orthodontic treatment taken 5 yrs ago & after consulting two other orthodontists for retreatment over the period of last 10 months. She complained of bad bite, food lodgment in lower right canine tooth region with difficulty in chewing and sensitivity with respect to the same tooth. She feared that it would soon be lost. Medical history was non- significant except for familial high Blood pressure.

She gave a history of previous orthodontic treatment for correction of severe crowding & high labial canines but as per her description it terminated unsatisfactorily with persistent problem of gingival recession in lower right canine (43) region. She further informed that at the time of previous orthodontic treatment, treatment plan was finalized without any radiological & photographic investigations; therapeutic extractions were done without any explanation to the patient as to why 14 not in the plan of therapeutic extraction. She further described that during the extraction of 44, crown had broken off; the root piece was removed during a second procedure, on enquiring about it she was told the details about it as "open method with sacrifice of buccal cortical plate" by the second operator who specified the specialty as an oral surgeon. According to the patient 43 was hypersensitive all throughout the course of previous treatment & she used to feel the tingling sensation in that region. She said that at the end of the previous treatment all the extraction spaces were filled up, removable retention appliances were given. She confessed

* *Corresponding author*. Tel.: +91 9892580848.
E-mail addresses: drparaggangurde@gmail.com, dnvadgaonkar@gmail.com (P. Gangurde).
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about her being non complaint during her previous treatment procedure owing to her busy teaching job schedule in a school. Recently she felt that the extraction spaces were reappearing & she was not satisfied with the outcome. She was in a state of confusion before considering retreatment.

1.1. *Clinical examination*

Hailing from the Southern part of India, her facial features were sharp with soft tissue thickness (nose, lips & chin) enough or little on excessive side to mask the underlying malocclusion.

Intra oral examination revealed missing 12, 24, 34, 44, 18, 28, 48 & 13 had been brought in its place at the end of previous orthodontic treatment. 14 & 15 were in buccal scissors bite with 43& 45. 13 showed excessive mesial inclination with a small rounded bony prominence felt mesial to its root prominence in vestibule.11 showed distopalatal rotation.25 showed Macrodontia with distopalatal rotation.38 was extruded behind distal margin of 27 and all lower anteriors showed tipping towards pt's left side with crowding.43 showed severe gingival recession with periodontal pocket of more than 4 mm. Molar relation was Angle's Cl II with both upper molars showing mesial inclination. Both canines were in Cl II relationship with 33 showing severe distal tipping. Midlines were off by 4 mm with lower mid line shifted to patient's left. Overjet was more on right side than the left. Overbite was deep (5 mm) (Fig. 1, 2, Table 1).

Functional analysis revealed that on closure from Centric Relation to Centric Occlusion there was deviation of lower jaw to patient's left side after initial contact. The case was diagnosed as Skeletal Cl II & dental Cl II Div 1 malocclusion with Cl II canines, 12 missing & an odontome in its place.

1.2. *Treatment plan*

At a joint clinic of Orthodontics, Oral sugery and Periodontics, following treatment plan was finalized to treat the case.

- ➢ Use of Fixed Orthodontic appliances of 022 slot of MBT prescription for leveling and aligning both arches.
- ➢ Surgical Removal of the odontome in between the roots of 11 & 13 & extraction of 38 (Fig. 3).
- ➢ Fatigue Resistant Device FORSUS for correction of CI II & mid line to be used after the complete leveling of arches &



Fig. 1 – Pre Orthodontic treatment Intraoral & Extraoral photographs (a to f).

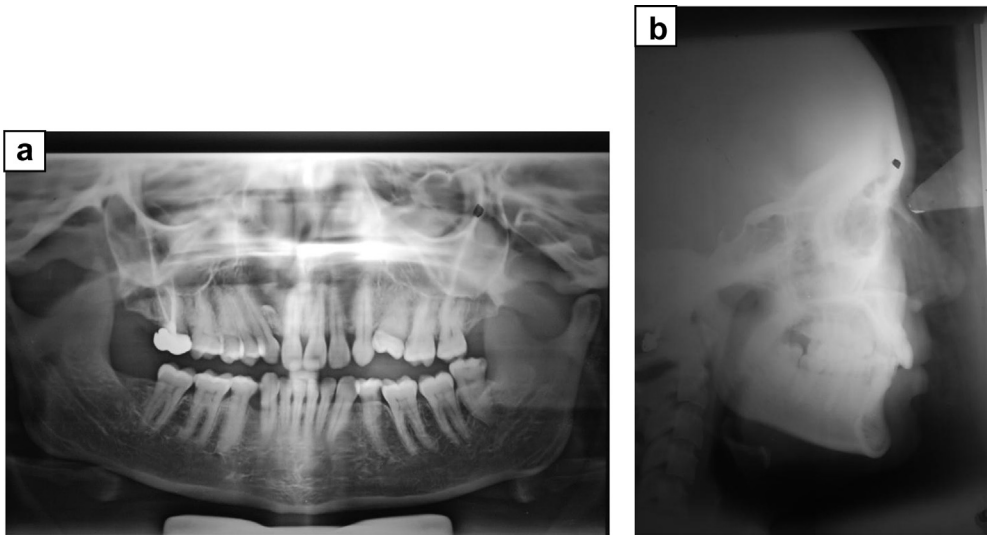


Fig. 2 – Pre-treatment – (a) OPG & (b) Lateral Cephalogram.

after the rigid consolidation of arches with 19 × 25 SS wires to support the FORSUS.

- ➢ Settling of occlusion to provide long term stability of achieved results.
- ➢ Crown lengthening procedure for 14 &25.
- ➢ Free Gingival graft for restoring attached gingiva in relation with 43.
- ➢ Modifying anatomy of 13 to make it resemble 12.
- ➢ Esthetic restoration of 15.

A fixed Orthodontic appliance of 022 slot of MBT prescription for leveling both arches with Upper 016" Ni–Ti & lower 16 × 22 Ni Ti was used. The odontome between the roots of 11 & 13 was surgically removed. Upper & lower 19 × 25 SS were put with rigid SS ligature wire for consolidation of both arches. Fatigue Resistant Device- Forsus No 25 were fitted on either side. After 10 weeks Right side Forsus was discontinued, retaining the appliance on the contralateral side for the purpose of mid line correction which was achieved over the course of next 3 weeks (Figs. 4–6, Table 1).

Table 1 – Pre and post treatment cephalometric measurements.

Measurement	Pretreatment	Posttreatment
Sagittal (Apical base and chin)		
SNA	75°	75°
SNB	70°	72°
SNPg	73°	73°
ANB	5°	3°
WIT'S APPRAISAL	6°	2°
NA – APg	4°	4°
Vertical/Divergency		
PP-MP	20°	21°
SN-MP	34°	34°
Dental (Incisor position)		
UI-SN	98°	94°
UI-PP	115°	107°
UI-NA	24°	20°
LI-NB	24°	27°
LI-APg	1 mm	0 mm
LI-MP	102°	105°
UI-LI	127°	131°
Soft tissue		
UL-E/LL-E	7 mm/5 mm	7 mm/4 mm
NL	90°	90°

A large skeletal base & dentoalveolar unit in upper jaw with deficient skeletal base & dentoalveolar unit in lower jaw manifests in posterior cross bite due to the discrepancy in inter arch relationship & spacial disparity.[3] This discrepancy was aggravated by imbalanced extraction i.e. extraction of 24, 34, 44 & not 14 by the previous operator probably due to missing lateral incisor in 12 area. This was further complicated by the presence of an odontome between the roots of 11&13.

Complication during the procedure of therapeutic extraction for orthodontics may give rise to problems to the neighboring tooth. Any local tooth size discrepancy or partial anodontia may further aggravate the situation. All these problems present simultaneously demanded attention by multispecialty team.

"Force Resistant Device-Forsus" acts by propeller action of the rod as the spring module gets compressed. This virtue was selectively utilized to correct the Cl II molars when it was used bilaterally as well as to correct the mid line discrepancy & posterior cross bite when used unilaterally on right side.[4]

1.3. *Post orthodontic procedures*

Crown lengthening procedure was carried out for esthetic reasons in relation with 14 &25. Free gingival graft was placed in relation with 43. (Fig. 7) Since 12 was missing & 13 was moved in its place, its morphology was modified to make it look like 12. Incisal edge was built up after reduction of the

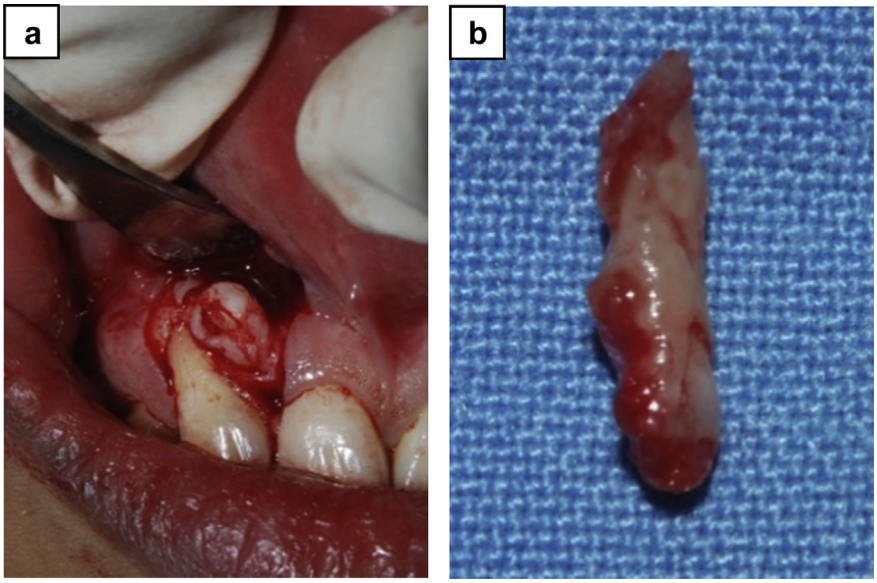


Fig. 3 – Surgical Removal of Odontome- (a) odontome seen exposed between 13 &14 (b) Extracted Odontome.

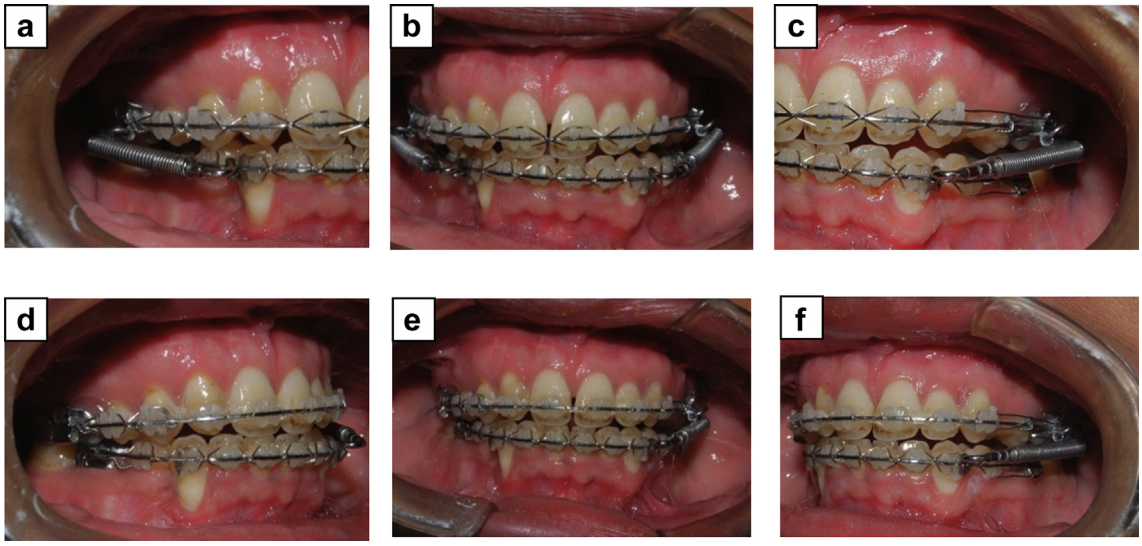


Fig. 4 – Mid treatment photographs (a to f).

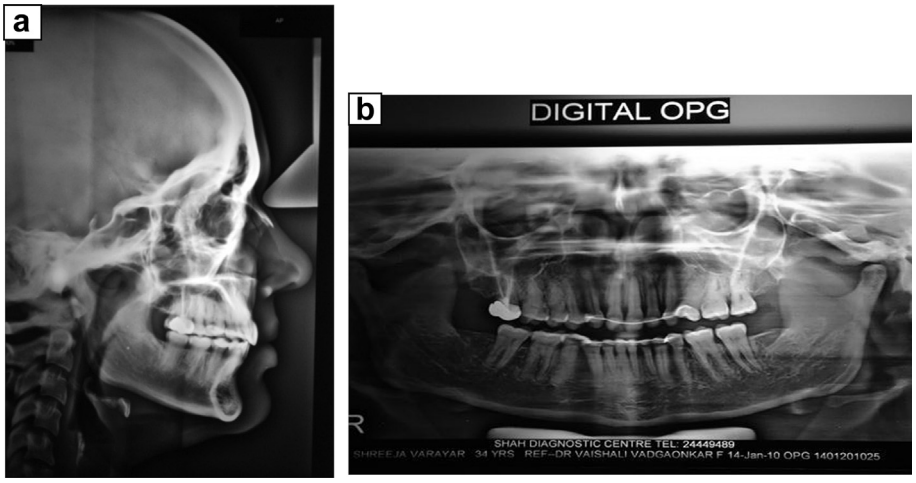


Fig. 5 – Post treatment Lateral Cephalogram and OPG (a &b).

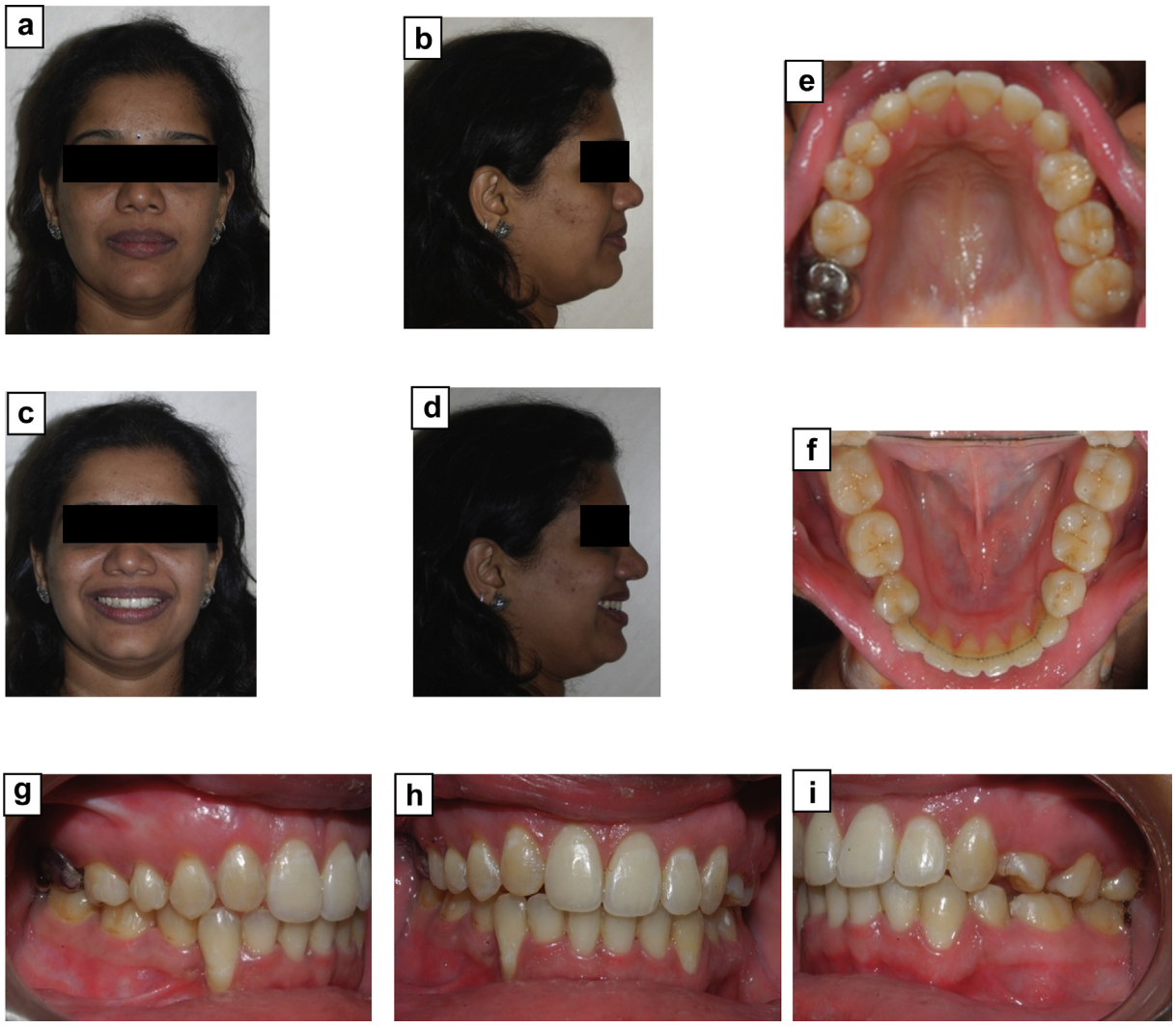


Fig. 6 – Post Orthodontic treatment Intraoral & Extraoral photographs (a to f).



Fig. 7 – Post-cosmetic built up.

cusp & prominence of central ridge to give this tooth a makeover to a semblance of 12. (Fig. 7) Ceramo metal crown fabricated for 15 (Fig. 8).

All objectives of the treatment plan were achieved to patient and operator satisfaction with following exception of periodontal treatment with respect to 43 which was found to be unsatisfactory and has been recommended for a reevaluation.

2. Discussion

Missing lateral incisor & presence of an odontome instead of it was the root cause of the problems to begin with in upper right quadrant. Importance of the complete set of diagnostic records cannot be overemphasized. Modern diagnostic tools like CBCT can pinpoint the three dimensional position of any

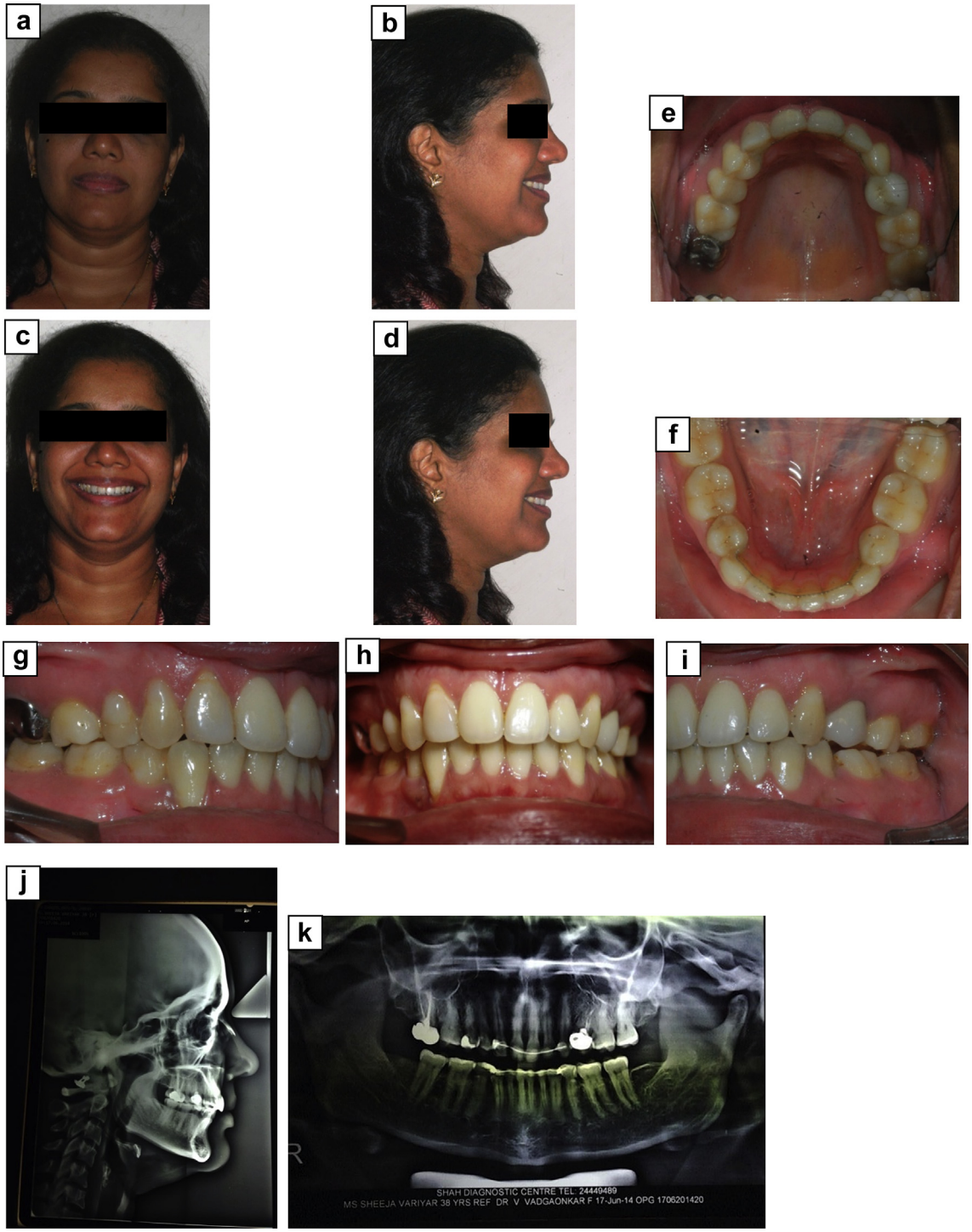


Fig. 8 – Post –Retention Extra oral, Intraoral photographs, Lateral Cephalogram and OPG after 4 1/2 yrs.

unwanted structure in our working field like the odontome in this patient.

There is a controversy about rotated posterior teeth to be left in their original position without derotating them but each situation demands operator to take a call. In this patient considering the fact that this was her second time treatment, out of need from the perspective of oral health than the aesthetics & also because of worrisome memories from the past experiences of the previous treatment, the tolerance level & the patience level was obviously lower than before. Such severe rotation runs the high risk of relapse after correction & demands surgical procedure viz. CSF (circumferential supracrestal fibrotomy) to prevent it. Patient was unwilling for it from the point of surgical trauma & finances both. Therefore the decision of keeping the 90° rotation of 25 without de-rotation was taken against the ideal choice of correction.

In the region of 43 the situation was inevitable due to lack of alveolar bone support & unfavorable axial inclination of that tooth. The poor prognosis of the gingival graft procedure after orthodontic correction was discussed with the patient by the periodontist before embarking upon the treatment with orthodontic appliances.

Prior to the Fixed Cl II correctors, options for correcting overbite were limited to products that were simple to install, but relied on patient compliance for ultimate success. Products such as headgear and elastics are put in and removed by the patient, but the Fatigue Resistant Forsus device is installed at the orthodontist's office and cannot be removed by the patient. It provides better strength and reliability.[5]

In Cl II malocclusion the narrower portion of mandibular dental arch comes to occlude with the wider portion of maxillary dental arch due to anterio posterior discrepancy in the respective basal bones which results in cross bite in buccal region.[3]

Asymmetrical growth, functional deviation of mandible & inevitable asymmetrical therapeutic extractions are the causes of resultant mid line shift. Applications of this modality to treat the cross bite as well as the midline shift is effective as it mesializes the distally positioned narrower part of mandibular dental arch anteriorly to eliminate the cross bite & midline shift very efficiently.[4] Use of Forsus in this case was not for skeletal objectives but purely for dentolalveolar changes, correction of Class II molar relation and midline correction. Literature supports evidence that even in young adults the treatment results are primarily due to dentoalveolar changes.[5–7] Follow up records of the patient 4 1/2 yrs after removal of FORSUS are found stable (Fig. 8).

3. Conclusion

Outcome of the multidisciplinary approach- Orthodontics for unusual application of Fatigue Resistant Device: FORSUS, Oral Surgery for elimination of the odontome, Conservative dentistry for cosmetic build up & Periodontics for gingival graft procedure was satisfying not only to the patient but equally to each member of the team.

The Force Resistant Device- FORSUS takes patient compliance out of the equation, which makes it a good intra-oral appliance for non-compliant patients.[8] It is no doubt an efficient tool in the hands of the operator for its application in such situation to get the optimal result (Figs. 5, 6).

Thus multidisciplinary approach is effective and desirable in treatment mutilated cases to deliver functionally stable and aesthetically acceptable results.

Conflicts of interest

All authors have none to declare.

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