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Case Report

PERIO - ORTHO INTERDISCIPLINARY MANAGEMENT FOR MIDLINE DIASTEMA RELATED TO ABNORMAL FRENUM AND INTRABONY DEFECT – A CASE REPORT

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ABSTRACT
Interdisciplinary approach helps the specialists of contributing disciplines immensely in diagnosis, treatment planning, execution of planned treatment and problem solving for any untoward complication. Orthodontic treatment may be adjunctive to periodontal therapy or vice versa. This case report describes a case of maxillary midline diastema that was related to the presence of highly placed papilla penetrating type of labial frenum with deep intrabony defect. A combined Periodontal and orthodontic approach involving Frenectomy, Bone grafting and closure of midline diastema was done to improve the anterior esthetic zone.

Key Words: *Midline Diastema, Frenectomy, Bone Grafting*

INTRODUCTION
Midline diastema occur in approximately 98% of 6 year olds, 49% of 11 year olds and 7% of 12–18 year olds (Mitchell, 1996). There are many possible causes of midline diastema—physiological, dentoalveolar disproportion, missing teeth, midline supernumerary teeth, proclination of the upper labial segment and a prominent frenum (Edwards, 1977). There have also recently been reports of self-inflicted pathological cases of diastema caused by tongue piercing (Rahilly and Crocker, 2003). In many of these cases, orthodontic treatment alone can help to close a diastema. Combined treatment with Periodontal and Orthodontic techniques may be advocated when, for example, a highly placed labial frenum with an intrabony defect. The case presented describes maxillary midline diastema due to a highly placed papilla penetrating aberrant frenum along with an existing deep intrabony defect. A combined orthodontic and periodontal approach resulted in successful management of the patient with diastema closure.

CASES
A 19 year old female patient was referred from Department of Orthodontics to Department of Periodontics, Mahatma Gandhi Post Graduate Institute of Dental Sciences, Pondicherry, with the complaint of maxillary midline diastema with highly placed papilla penetrating type labial frenum (for the treatment of frenectomy) (Figure 1). Her medical history was reviewed using a questionnaire and verbal confirmation. Her medical and dental history was non-contributory. A comprehensive periodontal examination was completed including extraoral, intraoral and radiographic evaluations.

On clinical examination, maxillary midline diastema of 5mm with highly placed papilla penetrating labial frenum along with a periodontal pocket of probing depth 8mm was present in relation to left maxillary central incisor (Figure 4). An intraoral periapical radiograph was taken to rule out the presence of supernumerary teeth and also for assessing the underlying bony defect. Radiograph revealed vertical bone defect in relation to mesial aspect of 21 and there was no associated supernumerary teeth (Figure 10 a).

Initial periodontal treatment consisting of oral hygiene instructions and complete scaling along with rootplaning on left maxillary central incisor was completed and patient was recalled after one week for management of aberrant frenum. Routine blood investigations were within normal limits and Frenectomy was done under local anaesthesia (Figure 2) and the patient was put under maintenance phase. Patient

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Figure 1:Pre-operative view papilla penetrating labial frenum with midline diastema of 5mm

Figure 2: Frenectomy done under local anaesthesia

Figure 3: Post – operative view one month after frenectomy

Figure 4: Periodontal pocket of probing depth 8mm in relation to 21

Figure 5: Papilla preservation flap technique

Figure 6: Deep two wall intrabony defect grafting done with biomedik-s

Figure 7: Reduction of probing Depth to 3mm in relation to 21

Figure 8: After orthodontic treatment with closure of midline diastema

Figure 9(a): Preoperative view

Figure 9(b): Postoperative view follow up after one year

Figure 10 (a): Preoperative radiograph vertical bone defectin relation to mesial aspect of 21

Figure 10 (b):Postoperative radiograph(sixmonths) evidence of bone fill in relation to mesial aspect of 21

Figure 10 (c): Post operative radiograph(one year)after closure of midline diastema

was reviewed after one month, there was satisfactory healing after frenectomy (Figure 3) but there was no reduction in probing depth and there was bleeding on probing in relation to left maxillary central incisor. As a result, surgical intervention was recommended to eradicate this underlying problem. Papilla preservation flap technique was done (Figure 5) and the deep two wall intrabony defect was filled using Biomedik-S (Figure 6). Immediate intraoral periapical radiograph taken revealed evidence of bone filling and the patient was put under maintenance protocol for six months. After six month revaluation there was complete healing of the frenum and probing depth reduced to 3mm along with complete bone formation in relation to mesial aspect of left maxillary central incisor (Figure 7). Patient was referred to Department of Orthodontics for the management of midline diastema. Follow up of the patient after six months of orthodontic treatment revealed closure of the midline diastema with satisfactory periodontal health (Figure 8).

DISCUSSION

Midline diastema is described as midline spacing greater than 0.5 mm between the proximal surfaces of adjacent teeth (Keene, 1963). Tait listed causes like ankylosed central incisor, flared or rotated central incisors, anodontia, macroglossia, dentoalveolar disproportion, localized spacing, closed bite, facial type, ethnic and familial characteristics, inter-premaxillary suture and midline pathology (Tait, 1934). Weber reported macrognathia, supernumerary teeth, peg laterals, missing lateral incisors, midline cysts and habits such as thumb sucking, mouth breathing and tongue thrusting (Weber, 1972). Angle concluded the presence of abnormal frenum as the cause for midline diastema (Angle, 1907). Keene reported the incidences of maxillary and mandibular midline diastema are 14.8% and 1.6% respectively. During mixed dentition stage a transient midline diastema develops (Keene, 1963). Treatment involves correct diagnosis and an early intervention relevant to its specific etiology. Different treatment modalities include orthodontic removable or simple fixed appliances, excision of the frenum, restoration techniques with direct composites, laminates, veneers, ceramic restorations, extraction of mesiodens, habit breaking appliances etc.

The morphology of the osseous defect largely determines the treatment technique to be used. Two wall angular defects can be treated depending on their depth, width, and general configuration.Two wall defects are the most common bony defects found in patients with periodontitis. Numerous therapeutic grafting modalities for restoring periodontal osseous defects have been investigated. Bone graft materials are generally evaluated based on their osteogenic, osteoinductive or osteoconductive potential. Hydroxyapatite has a calcium -to – phosphate ratio of 1.67,similar to that found in bone material (Carranza, 2006).

In the present case there was an associated deep two wall intrabony defect along with high labial frenal attachment and midline diastema. Treatment was planed in such a way to do frenectomy first followed by management of the intrabony defect and then referral of the patient to orthodontist for management of midline diastema. One of the most commonly used bone graft substitute is Hydroxyapatite (HA), which has similar crystal structure to that of natural bone mineral and has been in clinical use for over 30 years. Various forms of Hydroxyapatite (HA) bone grafts have been used in the treatment of human intrabony defects with favourable clinical results. In the present case BoneMedik – S, silicon contained coralline hydroxyapatite bone graft substitute which is similar in structure and composition to human cancellous bone was used as a bone substitute. Follow up of the patient after one year revealed satisfactory healing after frenectomy and bone regeneration along with the reduction of probing depth, so that possible tooth movement was achieved for the closure of midline diastema.

Conclusion

Co-operation between different specialties in dentistry is extremely important in establishing diagnosis as well as in treatment planning. The interrelationship between orthodontics and Periodontics is often symbiotic and interdependent. Establishing a logical treatment plan can only occur if the initial diagnosis is correct. The diagnosis will lead to a prognosis for each tooth and the overall dentition. After completion

of active periodontal therapy, it is important to create a healthy periodontium that can be maintained with ideal home care and regular recall appointments. In the esthetic zone it is important to understand all the factors that affect the smile and that relate to uneven gingival contours.

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