Case Report / Olgu Sunusu

Bicuspidization: A Case report

Biküspidizasyon: Bir Olgu Sunusu

Chethena K.C[1], Pradeep K[2]

[1] Department of Periodontics, Sri hasanamba dental college and hospital, Hassan, Karnataka, India.573201
[2] Department of Conservative Dentistry & Endodontics, Manipal College of dental sciences, Manipal, Karnataka, India.576104.

Corresponding Author:

Dr. Pradeep K

Department of Conservative Dentistry & Endodontics, Manipal College of dental sciences, Manipal, Karnataka, India.576104

E-mail: drpradeepk@yahoo.co.in

Tel: +91 9739442258
Fax: 0820-2571966

Başvuru Tarihi/Received : 22-04-2013

Düzeltme Tarihi/Revised: 05-09-2013

Kabul Tarihi/Accepted: 11-09-2013

Özet

Molar dişlerin biküspidizasyonu endodontik cerrahide daha az sıklılta kullanılan bir tekniktir. Hastaların dişlerinin idamesine olan arzuları koruyucu diş hekimliğinde çıkarılması planlanan dişlerin korunmasını zorlamaktadır. Bu bulguların ışığında, bilinir ki, periodontal olarak furkasyon bölgesinde ciddi kemik kaybı ile tehlikeye düşen dişler kökleri ile iyi bir şekilde korunabilir. Bu olgu sunumunda sol alt birinci molar dişin basit bir işlem olan biküspidizasyonu ve sonraki protez tedavileri sunulmuştur.

Anahtar kelimeler: Biküspidizasyon, Hemiseksiyon, Furkasyon tutulumu, Mandibular molar.

Abstract

Bicuspidization of molars is a less commonly used technique of endodontic surgery. The increased desire of patients to maintain their dentition has forced conservative dentistry to conserve the teeth in the mouth which are planned to be removed. In the light of this finding it is known that periodontally compromised teeth with severe bone loss at the furcation area may well be retained of their roots. In this case report bicuspidization of the left mandibular first molar with a simple procedure and subsequent prosthetic treatments are presented.

Key words: Bicuspidization, Hemisection, Furcation involvement, Mandibular molar.

Introductıon

The progressing inflammatory periodontal disease, if untreated, ultimately results in attachment loss. This can affect the bifurcation or trifuracation of multirooted teeth (1). The anatomy of the furcation is such that it impedes accessibility for professional and personal plaque control measures eventually resulting in tooth loss (2). Furcation sites repeatedly shown to respond less favourably to conventional periodontal therapy than flat surfaces on root due to concavities and ridges [3,4]. Thus inability to completely debride the involved furcation through the use of open flap curettage necessitates a more comprehensive approach to treatment of the periodontaly involved furcation.

The treatment, management and long-term retention of mandibular molar teeth exhibiting furcation involvement always have been a challenge, especially when the furcation involvement has progressed to a class III furcation. Other treatment options such as root amputation, hemisection, bicuspidization (bisection) and radisection techniques are the various surgical treatment alternatives of furcation involvements, and attempt the excision and removal of any segment of the tooth or a root with or without its crown portion (5).

Bisection/bicuspidization technique is the separation of mesial and distal roots of mandibular molars along with its crown portion, where both segments are then retained individually (6).

It is usually performed in Grade II or III furcation defects of mandibular molars. A multidisciplinary treatment procedure for such clinical situations is necessary to preserve the teeth in whole or in part. Thus tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth. These teeth can be useful as independent single units of mastication or as abutments in simple fixed partial dentures.

This case report describes a multidisciplinary treatment procedure for mandibular molar with grade III furcation involvement that includes intentional root canal therapy, surgical periodontal therapy with Bicuspidization and prosthetic rehabilitation.

Case report

A 32 year old male patient reported to the hospital with a complaint of an increasingly painful swelling over his mandibular left first molar. Dental history stated that the tooth had been treated by a general dental practitioner with an amalgam restoration since 2 years.

On intraoral examination, the tooth was sensitive to vertical and lateral percussion and the lingual gingival region was edematous and red. On probing there was 7mm probing depth mid lingual, and the tooth was revealed as Grade III furcation involvement. Radiographic examination showed that there were overhanging restoration in relation to mandibular second premolar, first & second molars, pulpal involvement observed in relation to 35,37,38 (Figure1).

Figure 1. Intraoral periapical radiographs confirming the Class III furcation defect.

Loss of interradicular bone completely under the furcation fornix of mandibular left first molar (Figure 2).

Figure 2 Panoramic radiograph (OPG) showing furcation defect in left mandibular first molars.

However there was a periapical lesion related to mesial root. Occlusaly amalgam restoration was involving the distal pulp horn of molar. Indicative of primary endodontic and secondary periodontal lesion.

Treatment plan: In the first treatment phase scaling and root planning was done under Local anesthesia. Advised for emergency access opening and removal of overhanging restorations. Then the extraction of mandibular left third molar done, the patient was prescribed with antibiotics and analgesics in order to eliminate the acute inflammation and to relieve pain. Following completion of root endodontic therapy w.r.t 35,36,37, the periodontal surgical procedure was planned with bicuspidization technique. A full thickness flap was reflected with the crevicular incision extending from the distal surface of the mandibular first premolar to the distal surface of the second molar. After the flap elevation the vertical cut method was made to separate the crown (Figure3).

Figure 3. Full thickness flap raised and tooth is tooth is sectioned vertically along the furcation.

Along shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area. The furcation area was trimmed to ensure that no residual debris were present that could cause further periodontal irritation. Scaling and root planning of the root surfaces, which became accessible on separation was done. The occlusal table was minimized to redirect the forces along the long axis of each root. Then the flap was repositioned and sutured with 3/0 black silk sutures (Figure 4).

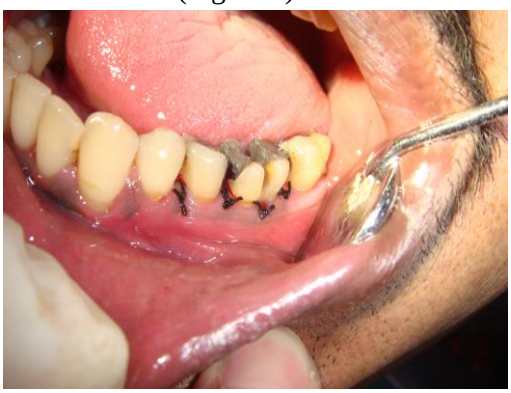

Figure 4. Repositioning of flap with sutures.

Post operatively first week the surgical site was stable with adequate healing (Figure 5).

Figure 5. Suters removed after 7 days.

After satisfactory tissue healing the dissected portions were prepared for porcelain restorations and each dissected parts of the tooth was crowned as a premolar tooth (Figure 6).

Figure 6. Permanent crown placement after bicuspidization procedure

Discussion

Bicuspidization is a valuable treatment option to save multirooted teeth having the questionable prognosis. The clinician splits the mandibular molar vertically through the furcation,without removing either half, leaving two separate roots that are then treated as bicuspids (7,8). This technique should be performed if the roots are adequate for length and healthy periapically.Farshchian and Kaiser has reported the success of a molar bicuspidization (9). They stated that the success of bicuspidization depends on three factors:

1. Stability of, and adequate bone support for, the individual tooth sections
2. Absence of severe root fluting of the distal aspect of the mesial root or mesial aspect of the distal root.
3. Adequate separation of the mesial and distal roots, to enable the creation of an acceptable embrasure for effective oral hygiene

However, bicuspidization should be avoided when the furcation is deep and the roots are fused together. According to Newell the advantage of the bisection is the retention of some or the entire tooth (10). But the disadvantage is that the remaining root or roots must undergo endodontic therapy and the crown must undergo restorative and prosthodontic management.

The role of endodontic care prior to bicuspidization procedure has a long history and it has remained today as a necessity in treating furcally involved mandibular molars (11,12).

However, failure to perform endodontic treatment first is not a contraindication for root resectioning, if it can be determined that a successful root canal filling is practical and possible (13).

In case when the tooth has lost part of its root support, it will require a restoration to function independently or to serve as an abutment for a splint or crown or bridge. But, a restoration may lead to periodontal destruction, if the margins are defective or if non-occlusal surfaces do not have an anatomic and physiologic form. This confirms the importance of accurate marginal adaptation of the final restoration (14,15). In the case reported, various aspects of occlusal function such as location and size of contacts and the steepness of cuspal inclines may have played a significant role in causing mobility before treatment.(16). During treatment, occlusal contacts were reduced in size and repositioned more favorably. Lateral forces were reduced by making cuspal inclines less steep and eliminating balancing incline contacts(17). Success of root resection and separation procedures depends, to a large extent, on proper case selection. In this case, the roots of the involved tooth were adequate in length and periapically healthy, and therefore bicuspidization technique was preferred.The prognosis for root separation or resection is the same as for routine endodontic procedures provided that case selection has been performed correctly and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient.

Conclusion

In today’s era of dentistry the clinicians prefer extracting the involved tooth and replacing it with fixed prostheses or dental implants to avoid the complexity of the treatment procedures. Although dental implants demonstrate a very high success rate, additional cost factor is still a matter of concern. Therefore, tooth extraction must be the last treatment alternative with the recent developments in periodontics, endodontics and restorative dentistry. Although there are few case reports about bicuspidization in the

literature, this technique is a successful alternative on such furcal defects.

References:

1) Samir Shah, Bhavesh Modi, Khushboo Desai, Sarin Duseja. : Hemisection – A conservative approach for a periodontally compromised tooth - A Case Report. J. Adv Oral Research. 2012;3(2):31-36

2) Matia J I, Bissada N. F, Maybury J. E, Ricchetti P.Efficiency of scaling of the molar furcation area with and without surgical access.In J Periodontics Restorative Dent 1986; 6: 24–35.

3) Nordland, P, Garrett, S, Kiger, R., Vanooteghem, R., Hutchens, L. H. & Egelberg, J. The effect of plaque control and root debridement in molar teeth. J Clin Periodontol.1987; 14: 231–36.

4) Loos, B., Nylund, K., Claffey, N. & Egelberg, J. (1989) Clinical effects of root debridement in molar and non-molar teeth.A 2-year follow-up. J Clin Periodontol.1989; 16: 498–504.

5) Qazi SS, Manzoor MA, Khan HH, Arjumand B, Qureshi R. Biphasic Resection of a Mandibular Molar: Case Report. J Coll Physicians Surg Pak. 2007;17:294-96.

6) Parmar G, Vashi P Hemisection: A case-report and review. Endodontology. 2003;15:26-29.

7) Yoshino T, Okamoto H. A clinical application of autotransplantation using furcationinvolved root. J Clin Periodontol. 2001;28: 201-206.

8) Augsburger RA. Root amputations, and hemisections. Gen Dent. 1976;24:35-38.

9) Farshchian F, Kaiser DA. Restoration of the split molar: bicuspidization. Am J Dent 1988; 1: 21-22.

10) Newell DH. The role of the prosthodontist in restoring root resected molars: A study of 70 molar root resections. J Prosthet Dent 1991; 65:7-15.

11). Gerstein KA. The role of vital root resection in periodontics. J Periodontol 1977; 48:478-83.

12). Highfield JE. Periodontal treatment of multi-rooted teeth. Aust Dent J 1978; 23:91- 98.

13). Highfield JE. Periodontal treatment of multirooted teeth. Aust Dent J 1978; 23: 91-98.

14). Garrett S, Gantes B, Zimmerman G, Egelberg J. Treatment of mandibular Class III periodontal furcation defects: coronally positioned flaps with and without expanded polytetrafluoroethylene membranes. J Periodontol 1994; 65:592-97.

15). Haueisen H, Heidemann D. Hemisection for treatment of an advanced endodonticperiodontal lesion: a case report. Int Endod J 2002; 35:557-72.

16). Mehmet Dalkýz, Altuð Çilingir, Bedri Beydemir. Bicuspidization:A case report. Gülhane Týp Dergisi 2008; 50: 42-45

17) Jasjit kaur, Shkha bala, Navneet sharma. Bicuspidization – restoration of split molar – a case report.Indian journal of applied research.2013;3(7):78-80.