Intra-Socket Transplantation of Bicuspid to Re-establish Biologic Width

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KEY WORDS
Intra-socket transplantation; Replantation; Surgical extrusion; Re-establish biologic width;

ABSTRACT
Transplantation and reposition of a tooth in its socket is relatively simple and predictable and can be considered as an alternative treatment option particularly in patients with financial limitation.

This report describes a case of intra-alveolar transplantation of tooth #43 in a 35-year-old man. Clinical and radiographic examinations revealed tooth #43 with complicated crown-root fracture that had undergone endodontic treatment five months earlier. Reposition of mandibular bicuspid in its socket to re-establish biologic width and crown ferrule is an alternative treatment in cases with complicated crown-root fracture. Immediate replantation preserve viability of periodontal ligament cells and fibers attachment and good chance of healing is predicted.

Case Report
A 35-year-old man with non-contributory medical history presented to the endodontic clinic at the University of Shiraz, School of Dental Medicine for evaluation and possible treatment of tooth #43. He reported a positive history of trauma to the right lower jaw and fractured tooth #43 that had been treated endodontically by an undergraduate dental student 5 months earlier. Clinical examination revealed tooth #43 with complicated crown root fracture with severe gingival detachment (Figure 1). There was no mobility on tooth #43. All adjacent teeth were normal and responded to vitality tests. The radiograph showed previous endodontic treatment with overfilling (Figure 2).
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The treatment options offered to the patient included extraction and replacement with three-unit bridge, implant and intraocket transplantation. The patient was determined to preserve his tooth as long as possible and decided to have a surgical extrusion on tooth to lengthen crown, provide biologic width, and ferrule creation. An informed consent was obtained and treatment started.

Inferior alveolar nerve block (lidocaine 2% with 1:100,000 epinephrine) in combination with local infiltration (lidocaine 2% with 1:50,000 epinephrine) was administered. Surgery was carefully performed using an atraumatic aseptic technique; a fine periotome was used around the root and then extraction performed with a root tip forceps while avoiding pressure on the surrounding crestal bone. The root was inspected under ill-

Figure 1: Showing tooth #43 with complicated crown – root fracture

Figure 2: The periapical radiograph shows previously treated tooth #43 with fractured crown. Note the line of fracture below the crestal bone

Figure 3: Replantation of tooth in its socket in new position to re-establish biologic width and ferrule

umination and magnification. The apical root tip of extracted tooth was cold burnished using diamond tapered bur with high-speed handpiece, and immediately replanted into its socket with about 3-4 mm extrusion (Figure 3). Suture was used and surgical dressing was placed for stabilization (Figure 4).

Figure 4: Surgical dressing is placed after surgery

Figure 5: Clinical examination showing normal attached gingiva and fabricated porcelain crown
significant advantages over bridge replacement or dental implant treatment. In the case described here, clinical examination and radiograph revealed #43 with complicated crown-root fracture and biologic width involvement. If the biologic width is lost, it must be re-established before restoration by the use of orthodontic extrusion, surgical extrusion, and the use of the gingivoplasty or alveoloplasty [7-8].

Biologic width cannot be re-established by orthodontic extrusion alone because the gingiva and the alveolar bone moves coronally and causes aesthetic problems [7]. Therefore, periodontal surgery is required after orthodontic extrusion. Gingivoplasty or alveoloplasty needs gingival flap and it may not be esthetically acceptable because of the very inconsistent topography created between the adjacent teeth [8].

Surgical extrusion that was described and employed in this case was simple and predictable with good outcome. The criteria used to evaluate successful intra-socket transplantation are absence of progressive resorption, bone formation and reappearance of PDL and lamina dura, normal periodontal tissue adjacent to replanted tooth and ferrule creation [9-10].

Conclusion
In conclusion, intra-socket transplantation as a feasible alternative to bridge restoration or implant in cases with complicated crown-root fracture allows the preservation of alveolar bone growth and function of periodontal tissues. It is recommended to adopt the multidisciplinary approach, adequate case selection, and follow-up radiographs for treatment success.

Conflict of Interest
The authors disclose no potential conflicts of interest.

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