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Orthodontic reduction of a displaced alveolar fracture: a case study

CASE REPORT

Bruno Ella[1], Nathalie Devert[2], Etienne Bardinet[2], Yves Lauverjat[1], Jacques Pouget[3], Reynald Da Costa Noble[1], Marie-Josée Boileau[2]

Department of Odontology and Buccal Health, [1]Periodontology and Implantology; [2]Orthodontics; [3]Buccal Pathology, Pellegrin Hospital, University Victor Segalen, Bordeaux, France

Correspondence to: Bruno Ella, PhD, Department of Odontology and Buccal Health, 16-20, Cours de la Marne, 33082 Bordeaux cedex, France
Tel.: 0033557573011
Fax: 0033557573020
e-mail: tsir.ella@wanadoo.fr

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Abstract – A 42-year-old woman had sustained a severe dental trauma with an alveolar fracture after an epileptic attack. A tooth block 31, 32, 33 and 34 was dislocated about 7 mm in buccal direction. Panoramic X-rays and CT-scan disclosed the alveolar fracture without total disjunction of the fragment. An orthodontic appliance was used to reduce the fracture with gentle forces during a 5-month period. Normal function was established and the teeth remained vital.

Management of a severe dental trauma with alveolar bone fractures is dictated by concern for both the traumatized teeth and the bone fractures. The immediate treatment approach influences the outcome and may decrease the risk of complications (1). The aim of this case presentation was to show that gradual repositioning of a displaced alveolar block with gentle continuous forces using a fixed orthodontic appliance can favour the outcome. The patient was a 42-year-old woman that visited the emergency room of the Bordeaux University Center after an epileptic attack. She was referred to the odontology department 10 days after the initial treatment for extraction of the teeth 31, 32, 33 and 34. The teeth had been dislocated during the attack or during the intensive care. The extraction therapy was, however, abandoned after multidisciplinary, periodontal and orthodontic consultations (2, 3).

Diagnosis and treatment plan

An alveolar fracture with vestibular displacement of the dental block 31, 32, 33 and 34 about 7 mm was registered (Fig. 1). Panoramic X-rays (Fig. 2) and CT-scan (Fig. 3) disclosed an alveolar fracture without total disjunction of the fragment (Fig. 4). Periodontal examination with a graduated probe and the appearance of the gum showed normal conditions in the fracture zone. The vitality test of the teeth was normal. The treatment plan was to gradually reduce the fracture with an orthodontic fixed appliance using gentle continuous forces (4–6).

Treatment

An edgewise standard appliance 0.018×0.025 (inches) was bonded to the mandibular arch 36–46 with a round 0.018 stainless steel wire and retraction loops in fracture zones (7, 8). A gentle and continuous force, 50–100 g was applied to re-establish normal occlusion. A continuous 0.018 stainless steel wire was used after 3 weeks to complete the dental alignment and fixate the fragments during bone adaptations. The patient was given advice of rigorous dental hygiene with tooth brushing and rinse with chlorhexidine for 15 days. She was monitored once a week during the first month and then once a month until the fourth month. Two weeks after fitting of the orthodontic appliance, the dentoalveolar block had successively resumed in physiological position. The vestibular displacement was reduced from 7 to 3 mm (Fig. 5). The occlusal trauma had disappeared. Vitality test was positive for 31, 32, 34 and 35. The teeth showed some horizontal mobility. The dislocated block had regained its position after 2 months (Fig. 6) and the teeth had normal sensibility and mobility and were perfectly aligned after 4 months (Fig. 7).The appliance was removed after 5 months (Fig. 8) and the teeth had normal vitality and function (Fig. 9). No retention was fitted.

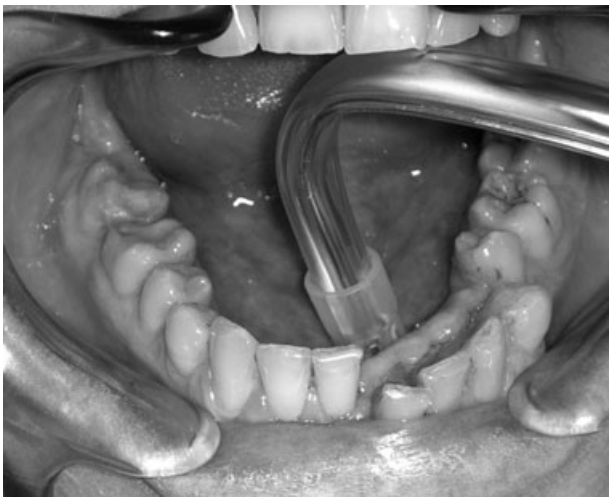

Fig. 1. The view of displaced alveolar block by more than 7 mm on the left side.

Fig. 2. A Panoramic shows the global aspect of the bone.

Fig. 3. A multi-band appliance is fitted to the mandibular arch.

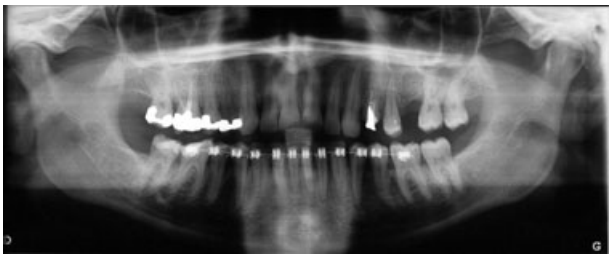

Fig. 4. Installation of the continuous arch bars after three weeks.

Fig. 5. In two weeks the vestibular displacement was reduced to 3 mm.

Fig. 6. After two months, the dislocated dentoalveolar block had regained its position on the mandibular arch.

Discussion

The patient was referred to the clinic 10 days after the trauma. Inflammation in the fracture zones must therefore have started and healing of soft tissues has begun (9–12). In such a case, successive reposition of fractures has been recommended (13). The teeth in the fracture

Fig. 7. In the 4th month, the teeth were perfectly aligned on the mandibular arch.

Fig. 8. In the 5th month the arch bars were removed.

Fig. 9. The alignment of the teeth was in compliance with normal occlusion.

zone were vital with normal periodontal conditions and could thus be used as an anchorage for an orthodontic fixed appliance. To re-establish the occlusion gentle forces were used to reduce the fractures. The teeth in the luxated block remained vital and with normal periodontal conditions indicating a good prognosis for the teeth. A 4-year follow up of severely luxated teeth is, however, recommended (14, 15).

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