

Severe complication of a bonded mandibular lingual retainer

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Bonding a flexible spiral wire retainer to the lingual surfaces of all 6 anterior mandibular teeth is a commonly used type of retention. Complications are rare but can be serious enough to produce biologic damage. This article presents a serious complication of a lingual flexible spiral wire retainer. Four years after the orthodontic treatment, a 20-year-old man sought treatment for a broken flexible spiral wire retainer. The clinical examination showed about 35° of buccal root torque of that tooth. A cone-beam computed tomography image showed that the root and the apex of the tooth were almost completely out of the bone on its buccal side. Surprisingly, the tooth's vitality was preserved. The tooth was moved back, nearly to its original position; clinically, only a gingival recession remained. Orthodontists and dentists should be aware of possible complications of bonded retainers. Patients should be clearly informed how to detect problems at an early stage. (*Am J Orthod Dentofacial Orthop* 2012;142:406-9)

Bonded retainers in the mandible are today a standard of care. For example, Renkema et al¹ found recently that 97% of all Dutch orthodontists use fixed retainers, usually flexible spiral wire retainers. In the mandible, 70% of the retainers were bonded to all 6 anterior teeth. Renkema et al² showed also that flexible spiral wire retainers bonded to all anterior teeth demonstrate 90.5% efficacy 5 years after debonding. Although they are more effective than retainers bonded only to the mandibular canines,³ failures and adverse effects, such as torque differences of the incisors or an increased buccal canine inclination, can occur.^{2,4} When these complications are detected early, interceptive measures can prevent damage to periodontal tissues and bone. However, when they are found too late, they can be detrimental, and retreatment might become necessary. This article presents a severe complication of a flexible spiral wire retainer bonded to all mandibular anterior teeth.

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CASE REPORT

A 20-year-old man came to our clinic in Bern, Switzerland, 4 years after treatment because of a broken flexible spiral wire retainer between the mandibular right lateral incisor and canine. Initially, he had been treated with a straight-wire appliance because of congenitally missing premolars and misalignment of anterior teeth (Fig 1). After treatment, a flexible spiral wire retainer had been bonded (Fig 2). Subsequently, the patient was in orthodontic supervision for 2 more years. For the next 2 years, he did not show up for orthodontic checkups and did not consult a dentist. Although he had noticed an unusual position of his mandibular right canine, he asked for a check at our department only when his mandibular retainer broke. The clinical examination showed that the mandibular right canine was torqued about 35° buccally, with a strong lingual crown inclination and a recession of 1 mm on the buccal side (Fig 3). The tooth was vital. The increased root torque was not present before or after the orthodontic treatment (Figs 1 and 2). A 6 × 6-cm cone-beam computed tomography scan (3DX Accuitomo XYZ tomograph; Morita, Tokyo, Japan) was analyzed. The effective dose delivered to the patient by this device was within the range of 20 to 43 mSv, which is comparable with 1 to 2 panoramic x-rays.⁵ The root of the canine was almost completely out of the bone on its buccal side (Fig 4). The apex was on the outer limit of the buccal cortical bone, but the tooth's vitality was preserved; this means that the nerve and the vascular bundle had followed the apex (Fig 5).

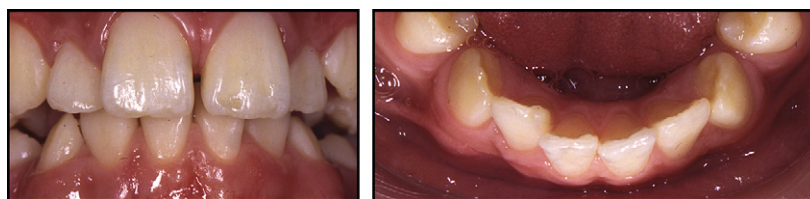


Fig 1. Pretreatment photographs.

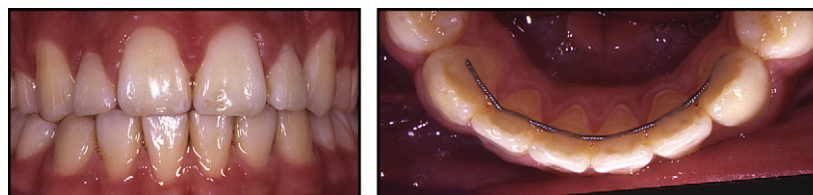


Fig 2. Posttreatment photographs.

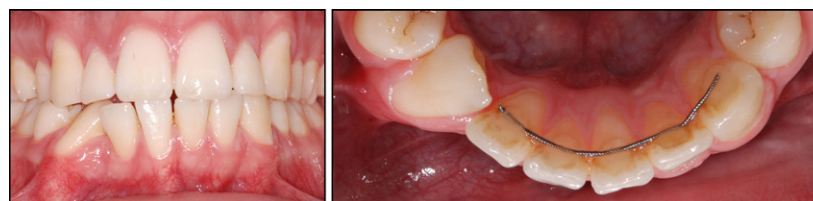


Fig 3. Four years after the end of treatment, the patient returned because the bonded flexible spiral wire retainer failed between the mandibular right canine and lateral incisor; massive torque was observed on the canine.

Because the patient did not want a comprehensive orthodontic treatment, he was retreated with a partial mandibular fixed appliance. Before the end of retreatment a new cone-beam computed tomography scan was taken with the same machine. The scan showed that the mandibular right canine was moved back almost to its original position. However, only the apical area of the root was covered with bone, whereas the rest of the root surface remained uncovered (Fig 6). Clinically, a gingival recession of 1 mm remained on the buccal side of the tooth (Fig 7). After retreatment, a new lingual retainer (0.0215 × 0.027-in rounded steel wire) was bonded to the mandibular canines only. The retreatment achieved satisfactory esthetic and functional results for the patient. He elected not to receive any periodontal root coverage procedures.

DISCUSSION

This case demonstrates a severe complication with a flexible spiral wire retainer bonded to the mandibular anterior teeth. Renkema et al² and Katsaros et al⁴ estimated

that 2.7% to 5% of patients with flexible spiral wire retainers have unexpected posttreatment changes. Katsaros et al⁴ identified 2 distinctive patterns of complications: torque differences between the adjacent mandibular incisors, and increased buccal inclination and movement of a mandibular canine. Our patient did not demonstrate either of these patterns. The root of the canine was torqued buccally, and the crown was inclined lingually. The large torque difference between the canine and the lateral incisor was not there before or after the orthodontic treatment. This means that this posttreatment change cannot be considered as relapse, because relapse implies movement toward the pretreatment position.

In our opinion, a 2.7% to 5% rate of posttreatment complications is not acceptable for long-term retention. Renkema et al³ evaluated 235 patients wearing for at least 5 years thick stainless steel retainers bonded only to the mandibular canines and found no severe posttreatment complications. Unfortunately, because these retainers were not bonded to all mandibular incisors, a relatively high percentage of patients had a slight increase in posttreatment incisor irregularity. Although

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