NiTi endodontic intraosseous implant

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ABSTRACT

Introduction: The Endodontics Implants are the metallic extension intraosseous of a tooth root. They are specially indicated for tooth stabilization. Also, considered an artifice to increase root length in an artificial way, the treated piece can endure the dynamism of its function. **Objective:** The objective of this case report is to present a conservative treatment to stabilize and create conditions for restorable two lower incisors, which were implanted in two endodontic intraosseous stabilizers made of NiTi endodontic files in order to restore its function in dental system.

Keywords: Dental implantation. Intraosseous. Endodontic. NiTi. Root canal therapy.

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Introduction

The Implantology today has a broad scope in the field of Dentistry. It left behind some conservative treatments considered viable alternatives to keep natural teeth in the dental system. One of these conservative treatments are the intraosseous endodontics implants (EI) or endodontic stabilizers introduced in 1943 by Bernier in order to increase the root length in teeth with short roots and mainly to stabilize teeth affected with periodontal disease and prolong the permanence of these teeth.[1,2]

The diagnosis and treatment profile are key determinants for the success of endodontic implant.

The endodontic implant is a metal post that is implanted through the root canal and extends to the bone in order to increase coronary root proportion, supporting the tooth and restoring its function.[2] There are clinical reports indicating that teeth with endodontic implants can be used as prosthetic abutments.[3]

Most authors recommend the use of cobalt chromium-molybdenum (vitallium) endodontic implants, being clinically and histologically well tolerated by the body and with absence of toxicity fully demonstrated.[1,4,5]

F. Goldberg[6] in a histological study observed the formation of a "pseudo periodontium" around the implant cobalt chromium, demonstrating the biocompatibility of the metal with the periapical tissues. However it was concluded that the vitallium is not an inert metal, because the corrosion of this material caused a reversible inflammatory response. Later this metal was gradually replaced by pure titanium alloy with excellent results,[2,5,7] whose osseointegration was observed both clinically and histologically by several authors (considering titanium a biocompatible metal).[4,5,8,9]

Although we must remember that any artificial device replaces the work of nature, IE is a conservative alternative that allows us to reconsider the extraction of teeth with stability problems[15] or periodontal disease.[1,8]

Case report

Male Patient, 25 years old, presented himself to the dental clinic of the FO-UCSM (Arequipa, Peru). He was radiographically evaluated, and referred to the Fixed Prosthodontics. After being evaluated was referred to the Buccomaxillofacial Surgery for extracting elements 31 and 32. The patient did not agree with the extraction, was referred to the sector of Endodontics (Fig 1).

When performing the clinical examination of the element 32, it was found exposed to the oral environment and diagnosed degree II mobility, with presence of vestibular fistula. In the radiographic examination we observed apical rarefaction, being diagnosed chronic apical periodontitis frame.

The clinical examination of the element 31 found it exposed to the oral environment, degree of mobility ,I diagnosed with the presence of vestibular fistula.

With radiographic analysis, we observed presence of endodontic treatment and apical rarefaction, was diagnosed with chronic apical periodontitis frame.

Then we decided to perform endodontic implants to stabilize these teeth and create the conditions for a future prosthetic restoration.

It was performed to the odontometry and osteometry measurement taking into account the vertical axis of the elements. The standard endodontic procedure was carried out with application of local anesthesia, isolation of the surgical field, surgical access, chemical-surgical preparation under aseptic conditions, cleaning and shaping of canal with files with rotary nickel-titanium ProTaper Universal system (Dentsply -Maillefer, Ballaigues, Switzerland). Was conducted dressing with Calen paste (calcium hydroxide paste) (SS White).

Before starting the endosurgical intraosseous procedure it was took into account the inclination axis of the teeth with crown-root-mandible. It was determined and provided osteometry selection of IE: in the case for a lateral incisor, osteometry of 12 mm; and in case of lower central incisor, 11 mm. Thus began the intraosseous endodontic surgery with an endodontic a X-Smart motor (Dentsply Maillefer) with a speed of 600 rpm and torque of 5N/cm and the same previously used rotary files system, preparing the bone bed only after osteometry calculation. The canal and bone bed were irrigated continuously with 0.12% chlorhexidine digluconate (Laboratorios Kin SA, Spain) and saline. Once the preparation in the alveolar bone and the implant is completed prior endodontic stabilizers made from NiTi files. For the element 32 was deployed a ProTaper file F-5 (Dentsply Maillefer) and for the element 31 a Profile taper file 40 0.06 (Maillefer, Ballaigues, Switzerland).

Previously before the stabilizer implantation, was performed in a profuse irrigation in the area, and the

channels were subsequently dried with sterile paper cones. Then the implant was cemented with Apexit sealer (Ivoclar-Vivadent, Schaan, Liechtenstein) preventing excessive contact of cement with the tip of the implant that would have contact with the alveolar bone.

The cavity access was sealed with ionomer reconstruction and micro-hybrid composite resin (Opallis / FGM) (Fig 2).

The patient was regularly evaluated post-implantation for case control.

After 16 months, clinical evaluation showed normal periodontal limits, absence of tooth mobility and periodontal disease. Radiographic bone repair was observed in the apex, the apical radiolucency suggests a limited apical healing and biocompatibility of the implant with bone tissue (Fig 3).

Discussion

Sumi et al[2] and Nevins et al[3] suggested that the cobalt-chromium-molybdenum is biologically tolerated

Figure 1. Preoperative periapical radiograph of lower incisors.

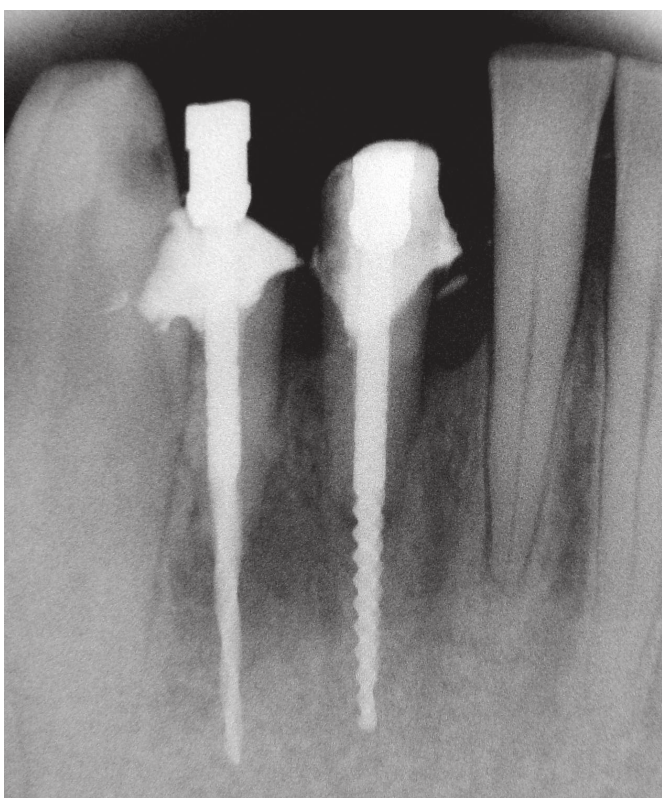

Figure 2. Postoperative periapical radiograph. Observe intraosseous endodontic implants.

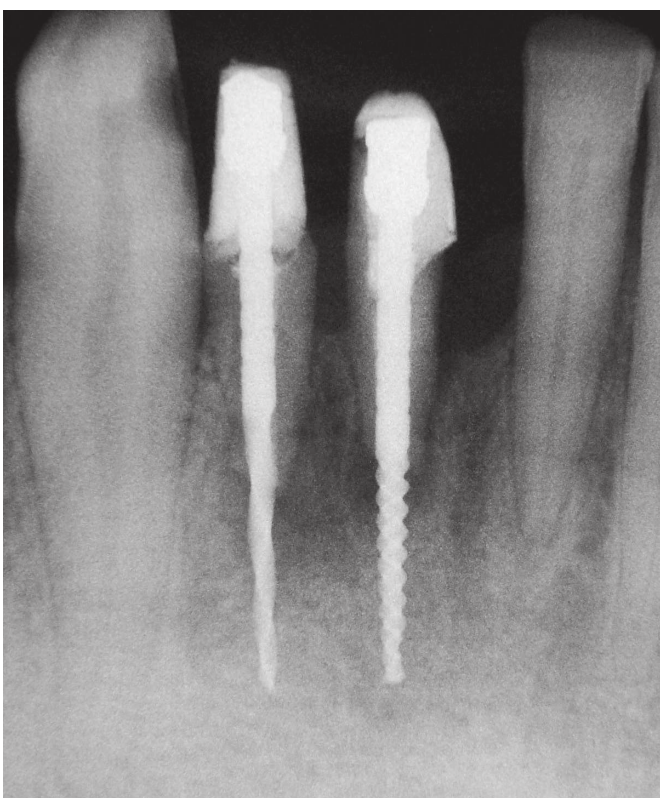

Figure 3. Radiographic proservation after 16 months of stabilization of elements 31 and 32.

by the body. Some authors claim that the teeth with IE can be used as pillars of different types of prosthesis.[3-10]

Although the cobalt-chromium-molybdenum implants proved inert despite causing a chronic inflammation of low intensity, some researchers have suggested the use of titanium implants due to its low corrosion and high biocompatibility with periapical tissues.[4]

We decided to replace the endodontic cobalt-chromium-molybdenum implants for the made of endodontic files from nickel-titanium, which have been successful. Due to its biocompatibilidade[11,12] and osseointegration radiographically detected, Assad et al. stated in their study that nickel-titanium alloys can be used frequently as surgery[12] materials.

Cranin et al[13] after an evaluation of 952 endoimplants found that 91% of these were successful. We conclude that the success rate of endodontic implants of NiTi can achieve similar success rate. However, until today there are not scientific studies to support this assertion.

For all these reasons, Feldman and Feldman[14] showed that endodontic implants should be considered as a viable conservative alternative in the treatment plan.

Endodontic implants are considered a conservative treatment to restore function and preserve natural teeth that are apparent for the clinical failure or extraction. In Endoimplantology if there is a clinical and radiographic diagnosis accurate, correct selection of an endodontic implant, is a suitable technique, IE will provide security and success. At the same time, it is important to know that the indiscriminate use of these types of implants, without an accurate selection of cases (excessive degree of tooth mobility, periodontal disease, severe radiolucency around the implant) leads to treatment failure.

The endodontic implant should be disclosed in the dental field and most frequently performed. With careful selection of cases, intraosseous endodontic implants are safe and effective.

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