A 35-year-old Asian woman, nonsmoker, in good general health, was referred after horizontal root fracture of the left maxillary central incisor (Figures 1 and 2). She reported that she suffered from a trauma several years before, and that the broken tooth was severely discolored and had been endodontically treated before fracturing.

Clinical examination revealed a horizontal root fracture below the gingival level. The periodontium was healthy with no sign of infection. Radiographic examination showed that the fracture had extended to the bone level. The intermaxillary relationships were normal. Analysis of the smile showed a high lip line.

Treatment plan
The UL1 was diagnosed as hopeless. From a periodontal point of view, the clinical situation was considered as favorable: The gingival margin was at the same level as the adjacent central incisor, and the mesial and distal papillae were present and in their proper position.

The patient underwent computerized tomography to evaluate the available bone volume in the apex area of the UL1 as well as the integrity of the buccal plate of the UL1 (Figure 3). The examination of the CBCT

Figures 1 and 2: The patient presented with a horizontal root fracture of the left maxillary central incisor

Educational aims and objectives
This article aims to present a case study illustrating immediate implant placement after extraction of the UL1.

Expected outcomes
Implant Practice US subscribers can answer the CE questions on page XX to earn 2 hours of CE from reading this article. Correctly answering the questions will demonstrate the reader can:
- Recognize the advantages of immediate implant placement and temporization, when properly indicated.
- Recognize that proper indication is a basic principle in implant placement.
- Realize that the success of implant placement in part relies on atraumatic extraction.
- Realize that sufficient primary stability is imperative for implant success.
- Identify types of materials and techniques that assist in implant placement from a biological standpoint and prosthetic perspective.

Figure 3: The available bone volume at the apex and integrity of the buccal plate was assessed

Leon Pariente, DDS, is in private practice in Paris limited to implants and periodontology. He is a graduate of the University of Paris Rene Descartes, has completed the Advanced Program in Implant Dentistry at the New York University College of Dentistry (2012), and published several research projects at the Prosthetic and Implant Department of the University Paris Rene Descartes.

Case study: immediate implant placement and temporization
Dr. Leon Pariente demonstrates the protocol and rationale for placing immediate temporaries in the anterior
Immediate implant placement after extraction of the UL1 was planned. Immediate temporization was intended, subject to sufficient primary stability of the implant. The implant chosen for the procedure was a 4.1 mm × 12 mm Straumann® Bone Level Tapered Implant.

**Surgical procedure**

The UL1 was extracted atraumatically without raising a flap or osteotomy (Figure 4). The extraction socket was meticulously cleaned and rinsed with Betadine® (Purdue Products LP, Stamford, Connecticut). The drilling sequence included 2.2 mm, 2.8 mm, and 3.5 mm drills (Figure 5). The countersink drill or tap was not used in this case to safeguard sufficient primary stability. The implant was placed with a final torque of 45 N cm (Figures 6 and 7). In its final position, the implant platform lay 4 mm under the ideal gingival margin (compared to the adjacent central incisor — see Figure 8). A titanium temporary abutment for the crown was placed, and a laboratory-made shell was positioned without interfering with the temporary abutment (Figure 9).

Before placing the provisional crown, the gap between the implant and the buccal showed that the buccal plate was intact 3 mm below the gingival level; correlated to the clinical examination, the future extraction socket was determined as Class I of Elian (Elian, et al., 2007). The bone volume correlated to the axis of the tooth and was considered as favorable for immediate implant placement, Class I of Kan (Kan, et al., 2011).

**Figure 4:** Atraumatic extraction of the UL1

**Figure 5:** The drilling sequence included 2.2 mm, 2.8 mm, and 3.5 mm drills

**Figure 6 and 7:** The implant was placed with a final torque of 45 N cm

**Figure 8A and 8B:** In its final position, the implant platform lay 4 mm under the ideal gingival margin

**Figure 9:** A titanium temporary abutment for the crown was placed and a laboratory-made shell was positioned without interfering with the temporary abutment
plate was filled with a particulate bone augmentation material. The screw-retained temporary crown was then torqued to 35 Ncm (Figure 10).

Three months after placement, an implant level impression was taken for final restoration. Follow-up 10 months after implant placement showed a preserved gingival contour (Figures 11 and 12).

Conclusion
Immediate implant placement and temporization, when properly indicated, has three main advantages: timing, biology, and prosthetics. Treatment time and number of surgical procedures are reduced compared to a delayed approach.

From a biological standpoint, using a slow-resorbing material to fill the gap between the implant and the buccal plate can enable predictably preserved bone volume. The provisional crown supports the gingival architecture and helps maintain the pre-existing positions of the gingival margin and mesial and distal papillae.

From a prosthetic perspective, placing an implant-retained provisional crown on the day of surgery simplifies the temporization in the anterior area, allowing the patient to leave the practice on the same day with a fixed provisional.

The success of this procedure relies on three basic principles: proper indication, atraumatic extraction, and sufficient primary stability of the implant. The latter depends widely on the choice of the implant design and drilling protocol, which should be considered for greater primary stability.

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