



## ***Clinical Case Presentation***

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***The Encode® Complete Restorative System For  
Fabrication Of Patient Specific Restorations®***

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# Treatment Of The Posterior Maxilla With The Encode® Complete Restorative System

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## Introduction

Patients desire aesthetic restorations for missing teeth supported by dental implants. With the introduction of CAD/CAM technology for the fabrication of custom abutments, clinicians may be able to provide patients with highly predictable, aesthetic restorations, which support the soft tissue, using a process that mirrors conventional dentistry from ease of use and cost perspectives. Since 2005, it has been possible to fabricate Patient Specific Restorations® using Encode

Abutments. Once the surgeon places Encode Healing Abutments at the time of implant placement or at implant uncovering, the restorative dentist need only make a simple impression of the healing abutments. From here, the laboratory technician sends the mounted casts to BIOMET 3i.

The newest innovation now includes robotic placement of implant analogs into the master cast in a process called Robocast™ Technology. This process eliminates the need for an implant level impression, which makes the procedure more efficient and simple, thus saving valuable chairtime for the restorative dentist. Additionally, there is no need to have an inventory of various components. The data from the codes embedded on the occlusal surfaces of Encode Healing Abutments transmits information about the implant connection type, restorative seating surface diameter and hex orientation. The definitive abutments are then designed virtually and the data is transferred to a milling machine for fabrication of definitive Encode Abutments.

The *Clinical Case Presentation* to follow demonstrates a 54-year-old female patient who presented with a failed fixed partial denture supported by teeth Nos. 11 and 13. Tooth No. 13 (maxillary left second bicuspid) was fractured and deemed non-restorable (Figure 1). The patient desired replacement of the failed FPD with fixed restorations. The treatment plan accepted by the patient included extraction of the fractured tooth, implant placement and restoration of teeth Nos. 11, 12, 13 and 14 with individual crowns.

## Surgical Treatment

Following administration of local anesthesia, a sulcular incision was made around tooth No. 13, followed by a midcrestal incision in the edentulous area of tooth No. 12. A full thickness mucoperiosteal flap was elevated on the buccal and lingual aspects. The fractured root of tooth No. 13 was carefully extracted using periostomes and the socket was debrided with hand and rotary instruments. A round drill was used to mark the location of the implant in tooth site No. 12. A 2mm diameter twist drill was advanced into the edentulous space (tooth No.12) as well as the extraction site (tooth No. 13) to prepare the osteotomies for implant placement. The drilling protocol continued for each site following the manufacturer's protocol for placement of a 4/5mm x 13mm Full OSSEOTITE XP® (Expanded Platform) Implant for tooth site No. 12 and a 5mm x 11.5mm Full OSSEOTITE® Certain® Implant for tooth site No. 13. Encode Healing Abutments were chosen consistent with the implant platform, appropriate emergence profile and collar height for each implant. The collar heights of the abutments were selected such that the occlusal surfaces of the abutments were at least 1mm supragingival circumferentially. The chosen healing abutments were placed into the internal interfaces of the implants and



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10

tightened to 20Ncm of torque. The soft tissue flaps were closed around the healing abutments and secured with intermittent resorbable sutures. A periapical radiograph was taken to confirm complete seating of the healing abutments. A prefabricated fixed provisional restoration was placed over the Encode® Healing Abutments and was supported by teeth Nos. 11 and 14. The patient was dismissed with post-operative medications and instructions for oral hygiene.

### Restorative Treatment

Three months post implant placement, the patient was seen for evaluation. Healing was uneventful. The provisional fixed partial denture was removed from teeth Nos. 11 and 14 revealing healthy soft tissue maturation surrounding the Encode Healing Abutments and tooth preparations (Figure 2). An impression was made of the Encode Healing Abutments and natural tooth preparations. Light body polyvinylsiloxane impression material was syringed around the healing abutments and tooth preparations followed by placement of heavy body impression material in a closed stock tray. The impression tray was seated and the impression material was allowed to set per the manufacturer's instructions. The impression tray was removed and the impression was examined for verification that the entire occlusal surfaces of the Encode Healing Abutments, as well as the soft tissue contours and tooth preparation margins, were recorded (Figure 3). An impression was made of the opposing arch and sent to the commercial laboratory along with a shade selection and occlusal record.

In the laboratory, the impression of the Encode Healing Abutments was poured using a die stone for fabrication of a master cast (Figure 4). The casts were mounted on the recommended articulator (Stratos™ 100 with Adesso Split Plates, Ivoclar Vivadent, Inc. Amherst, NY) using the occlusal record. The work order was completed and the master casts were sent to BIOMET 3i for fabrication of definitive Encode Abutments.

After scanning the master cast, the abutments were designed virtually (Figure 5). Using the same data, implant analogs were placed into the cast with a computer driven robotic arm. This process, called Robocast™ Technology, allows the definitive Encode Abutments to be placed on the master cast (Figure 6) for fabrication of the definitive restorations by the laboratory.

At the insertion appointment, the Encode Healing Abutments were removed from the implants in tooth sites Nos. 12 and 13. The titanium nitride coated definitive Encode Abutments were seated into the internal interfaces of the implants with audible and tactile clicks, which ensured completed seating. The abutments were secured with Gold-Tite® Abutment Screws tightened to 20Ncm of torque with a torque driver (Figures 7 & 8). The individual PFM crowns were tried-in, adjusted interproximally and for optimal occlusal contacts in centric and eccentric positions. Verification radiographs were taken to confirm seating of the abutments into the implants and seating of the definitive restorations to the abutments. The definitive restorations for teeth Nos. 11 and 14 were cemented with RelyX™ Vitremer™ Luting Cement (3M ESPE, St. Paul, MN) and the restorations supported by the implants in tooth sites Nos. 12 and 13 were cemented with Temrex® Cement (Temrex Corporation, Freeport, NY) (Figure 9). The excess cement was carefully removed and a verification radiograph was taken (Figure 10). The patient was dismissed with oral hygiene instructions.

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