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Case

Immediate implant-supported full-arch hybrid prosthesis on an edentulous patient using a bar-retained overdenture in the mandible: Case Report.

Prótesis híbrida de arco completo con implante inmediato en un paciente edéntulo utilizando una sobredentadura retenida en barra en la mandíbula: reporte de un caso.

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Abstract: The hybrid prosthesis is a very predictable treatment option that allows patients to recover their oral functionality. It is a good alternative to conventional treatments and overdentures. The present report describes controlled an 80 year old female patient with controlled hypertension, who came for consultation with a bar overdenture with attachment holders on two external hexagonal dental implants; an immediate loading hybrid prosthesis was installed over four mandibular dental implants.

Keywords: Denture, overlay; mandible; dental implantation; dental prosthesis, implant-supported; aged, 80 and over.

Resumen: La prótesis híbrida es una opción de tratamiento muy predecible que permite al paciente recuperar su funcionalidad oral. Es una buena alternativa frente a tratamientos convencionales y sobredentaduras. El presente artículo muestra el reporte de caso de una paciente de sexo femenino de 80 años, hipertensa controlada, quien llegó a la consulta con una sobredentadura inferior en barra con ataches sobre dos implantes dentales hexágono externo, se le realizó una prótesis tipo híbrida con carga inmediata sobre cuatro implantes mandibulares.

Palabras Clave: *Dentadura postiza; mandíbula; implante dental; prótesis dental, con implante; mayores de 80 años.*

INTRODUCTION.

Oral implantology is a highly predictable dental discipline, playing an increasingly important role in oral rehabilitation. It presents high success rates, which increase the esthetic demands from patients and clinicians in implant-supported prosthesis rehabilitation.[1] Prostheses fixed on implants provide high satisfaction and good survival rates as opposed to removable prostheses.[2] The hybrid prosthesis that combines the prosthetic design with a metal structure where the implants are placed is an alternative to fixed rehabilitation. These prostheses are full-arch for total edentulous patients and increase primary stability, support and retention.[3] However, the extended healing time associated with a conventional loading protocol represents a

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disadvantage for the patient, so reducing loading time would be very beneficial.

Given the evolution and improvement of surgical techniques, immediate loading protocols have been frequently modified. Different loading times for dental implants have been described, which has been rather confusing. However, the classification presented by Weber *et al.,*[4] is still used. This considers immediate loading upon installation of the prosthesis within the first week after implant placement. Early loading occurs with installation of the prosthesis between the first week and two months after implant placement, and conventional loading considers installation of the prosthesis two months after implant placement. Likewise, Papaspyridakos *et al.,*[5] conducted a systematic review of loading protocols in total edentulous patients, suggesting that the immediate loading protocol achieves similar success and failure rates as those with conventional loading protocols.

Immediate installation can only be achieved through the multifunctional guide, which consists of a pre-determined transparent acrylic tray that is used as an aid for transferring the correct position of dental implants, occlusal registration and vertical dimension. This technique is carried out by reverse protocol, where a conventional prosthesis is made followed by a phase of assembly and adjustment of teeth. Once the occlusal adjustment has been carried out, the adjustment of teeth is repeated, resulting in the "multifunctional guide".

The aim of this report is to address the resolution of a complication in a total edentulous patient, user of an upper conventional prosthesis and a lower overdenture on two malpositioned dental implants that presented instability due to lack of retention.

CASE.

An 80-year-old female patient with controlled hypertension attends the postgraduate dental clinic at the Universidad Privada San Juan Bautista, Lima - Peru. The patient is a total edentulous patient on both jaws, user of an upper conventional prosthesis and a lower bar overdenture with attachment holders on two dental implants for approximately 3 years (Figure 1). In the anamnesis, the patient reported instability of the overdenture, the reason why she requested a new prosthesis.

Upon clinical examination, she presented a mesocephalic skull, mesofacial face, slightly convex profile. The initial panoramic radiograph showed the presence of two dental implants in the lower anterior area. After the evaluation and planning of the case, study models of the upper conventional prosthesis and the lower arch were taken. In addition, a baseplate and a lower bite block wax were made to determine the vertical dimension and labial contour, followed by assembly in a semi-adjustable articulator in relation to the upper conventional prosthesis. Subsequently, the lower adjustment of teeth in heat-cured transparent acrylic was duplicated for the preparation of the tomographic guide where projections were made for the implants in the mandible.

The cone beam computed tomography (Galileos Sirona, Dentsply Sirona, U.S.A.) verified the presence of two implants whose position made rehabilitation difficult, thus suggesting the placement of two 3.8x11.5mm implants in positions A and D (Figure 2). The surgical guide was used as a multifunctional guide, making perforations for the entry of the silicone.

After regularization of the alveolar ridge, the surgical sites were prepared following the manufacturer's surgical protocol (Strong SW, SIN, Brazil). They were prepared 5mm from the mentonian nerve as a safety margin and with a distal inclination in order to improve the anterior posterior distance. Two dental implants 3.8x11.5mm (Strong SW, SIN, Brazil) were installed, with an insertion torque of 55 N for the implant in position A and 60 N for the implant in position D.

Afterwards, the straight intermediate abutments (Strong SW, SIN, Brazil) were placed at torque 20 N to the abutment screws according to the manufacturer's protocol. The segment of the metal bar was installed for its splinting with the transfer abutments of the implants of position A and D with acrylic (Duralay, USA). Subsequently, the entire set was treated with addition silicone (Elite HD, Zhermack, Italy) through the holes previously made in the multifunctional guide, proceeding with the occlusion registration and corroborating the centric relation (Figure 3).

Once the transfer was obtained this was sent to the laboratory, where the reproduction of the soft tissues around the analogues of the intermediate abutments was

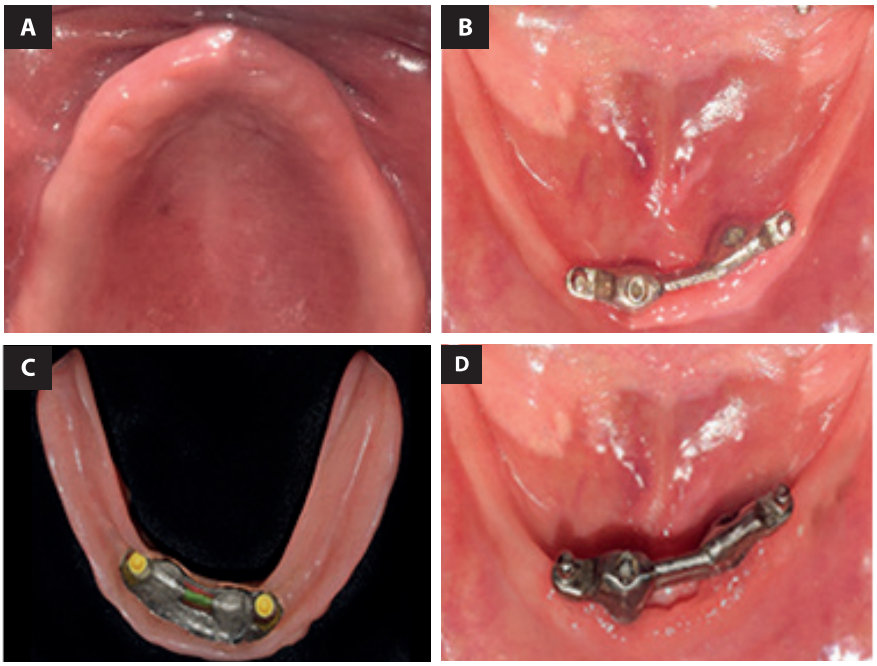
made in silicone (Gingifast, Zhermack, Italy) and the casting in type IV plaster (Elite Rock, Zhermack, Italy). The models were mounted on a centrically-adjustable articulator and sent to the laboratory with the lower adjustment.

This served as a guide for the reproduction of the shape, height and location of the teeth, as well as to determine the vestibular contour of the final prosthesis through the use of silicone keys. The metal structure was also tested in the mouth, confirming its passivity, in order to send it back to the laboratory where the margins of the adjustment were verified.

On the seventh post-operative day, the lower hybrid prosthesis was installed, verifying the passivity of the structure. The retention of the prosthesis was provided by the prosthetic screws at torque 10 N, covering the access channels with Teflon tape and sealed with light-cured resin to then make the adjustment of the occlusion.

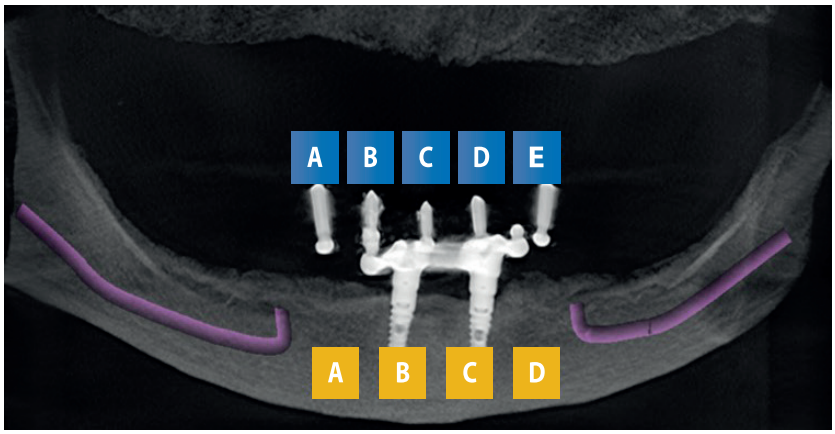
A week later, favorable healing of the stiches was observed. One month later, the patient had a panoramic x-ray taken and a control appointment, in which the stability and maintenance of the prosthesis was confirmed. In the third month, physiotherapy and oral hygiene follow-ups were performed. (Figure 4)

Figure 1. Initial intraoral photographs.



A: Superior occlusal view. **B:** Inferior occlusal view. **C:** Overdenture with attachments and clip. **D:** Occlusal view of the mouth-installed bar.

Figure 2. Initial intraoral photographs.



A: Edentulous ridge of position A. **B:** Previously installed implant of position B. **C:** Previously installed implant of position C. **D:** Edentulous ridge of position D.

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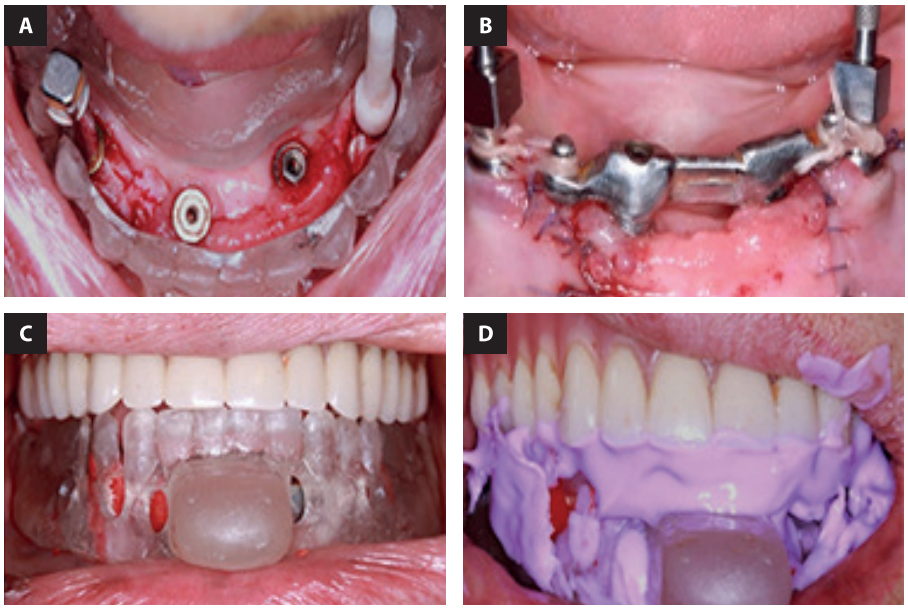
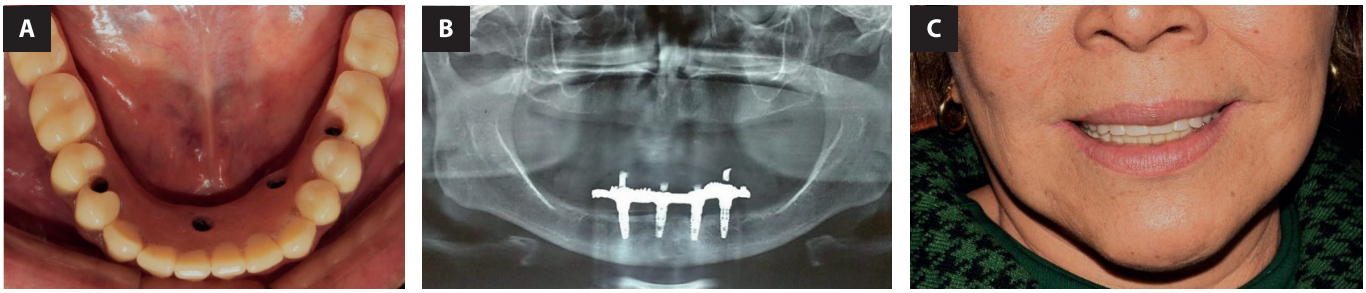
Figure 3. Surgical and prosthetic procedure.



A: Installation of the straight intermediate abutments with 20 N of torque. **B:** Installation of the metallic bar segment and dental splint with transfer abutments **C:** Occlusion verification with the multifunctional guide. **D:** Occlusion record with addition silicone.

Figure 4. Installation of prosthesis and subsequent medical check-up.



A: Installation of the hybrid prosthesis 7 days after surgery. **B:** Radiographic evaluation a month after the installation. **C:** Final photography 3 months after the installation.

DISCUSSION.

To shorten the healing or loading time is a big benefit for the patient. Papaspyridakos *et al.*,[5] discovered that the immediate loading with fixed prostheses in edentulous patients has the same effect as the early and conventional loading on both the maxilla and the mandible. The aim of this case report is to shorten these times by applying the immediate loading protocol along with the rehabilitation in a hybrid prosthesis. Immediate loading provides an instantaneous restoration of the function and the aesthetic aspects, and mitigate the psychological impact in total edentulous patients.

The immediate loading protocol requires a rapid manufacturing of the prosthesis, therefore, the dental implants are surgically placed through a multifunctional guide considering a prosthetically predetermined position. During this technique, a reverse planning protocol is carried out that involves presurgical procedures to manufacture the multifunctional guide through the duplication of the adjustment. The multifunctional guide shortens the manufacturing time for full prostheses with fixed implants, which allows the early or immediate loading of dental implants in edentulous mandibles with definitive prostheses.[6]

Wu *et al.,*[7] conducted a retrospective study on the impact of antihypertensive drugs on bone formation and remodeling by measuring the impact on the osseointegration and the survival rate of the implant. Their results showed that only 0.6% of implants failed in patients under treatment with antihypertensive drugs, whereas the percentage of failure in patients under no treatment was 4.1%.

This study revealed that antihypertensive drugs have a positive effect on osseointegration and they can be associated to the high level of success of dental implants. The number of implants installed in the mandible is limited by the distance available between the two mental foramen considering a 5mm margin of safety. Besides considering the number of implants, the location of the lingual foramen must be evaluated, since it lodges an important neurovascular bundle, which can lead to serious hemorrhages and, as a result, obstruction of the airways.[8]

According to the patient, chewing comfort and efficiency was higher due to the use of the hybrid prosthesis, in comparison to the use of the prosthesis on attachments or a conventional one, which the patient had at the time of the first medical consultation.

This is in agreement with the work of Limmer *et al.,*[9] in which they evaluated the satisfaction of the patient in relation to the use of the prosthesis on attachments regardless of the selected material, providing a higher comfort to the patient in comparison to the use of conventional total prostheses.

CONCLUSION.

This case report revealed the resolution of a prosthetic complication with an implant-supported overdenture over an anterior bar and the installation of two additional implants immediately loaded.

By considering the important surgical and medical record of the patient, it was decided to keep the implants previously installed as attachment and support for the installation of a hybrid prosthesis of immediate loading. Through this procedure, support, retention, stability and prosthetic versatility were improved.

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Ethics approval: It is not necessary, for this study

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