

Conversion of a muco-supported complete prosthesis into fixed implant-supported prosthesis using the NeoConvert™ solution in a maxillary rehabilitation with guided surgery and immediate loading

Carolina Olaya Álvarez ¹, Lina Camila Arenaza ¹, Félix Luna Dinolé ¹, Erton Massamitsu Miyasawa ², Rubens Moreno de Freitas ², Flávia Noemy Gasparini Kiatake Fontão ²



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CASE REPORT

ABSTRACT

Modern dentistry has seen the development of different techniques aimed at improving patient satisfaction. Immediate loading and delivering a fixed implant-supported prosthesis at surgery time has become an option. This case report describes the clinical results of the immediate loading of a conventional complete denture converted into a fixed prosthesis on six implants placed under a guided surgery protocol. A male patient, systemically healthy, with total upper edentulism, attended the ILAPEO College to begin treatment with implants in the upper jaw. Six implants were placed under a guided surgery protocol, and then immediate loading was performed by converting the patient's complete denture into a fixed prosthesis using the NeoConvert™ system. Immediate loading using the NeoConvert™ technique is a functional and predictable alternative, reducing clinical time and achieving great patient and clinician satisfaction.

Keywords: Immediate loading; Denture conversion; NeoConvert; Implant-supported prosthesis; Fixed prosthesis.



Conversão de uma prótese total muco-suportada em prótese fixa implantossuportada utilizando a solução NeoConvert™ em uma reabilitação maxilar com cirurgia guiada e carga imediata

RESUMO

A odontologia moderna tem desenvolvido diversas técnicas com o objetivo de melhorar a satisfação do paciente. A carga imediata e a entrega de uma prótese fixa implantossuportada no momento da cirurgia tornaram-se uma opção. Este relato de caso descreve os resultados clínicos da carga imediata de uma dentadura completa convencional, convertida em uma prótese fixa sobre seis implantes colocados sob um protocolo de cirurgia guiada. Um paciente do sexo masculino, sistemicamente saudável, com edentulismo total na arcada superior, procurou a Faculdade ILAPEO para iniciar o tratamento com implantes na maxila. Seis implantes foram colocados utilizando um protocolo de cirurgia guiada, e, em seguida, a carga imediata foi realizada por meio da conversão da dentadura completa do paciente em uma prótese fixa, utilizando o sistema NeoConvert™. A carga imediata com a técnica NeoConvert™ é uma alternativa funcional e previsível, reduzindo o tempo clínico e proporcionando alta satisfação ao paciente e ao clínico.

Palavras-chave: Carga imediata; Conversão de dentadura; NeoConvert; Prótese implantossuportada; Prótese fixa.

Instituição afiliada – ¹DDS, MsC Student in Dentistry at Ilapeo College, Curitiba, Brazil; ² DDS, MsC, PhD, Professor at Ilapeo College, Curitiba, Brazil

Autor correspondente: Erton Massamitsu Miyasawa ertonmassa@gmail.com

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INTRODUCTION

Modern dentistry has seen the development of different techniques aimed at improving patient satisfaction, mainly regarding comfort, esthetics, and a short treatment period (1). The immediate loading protocol has changed oral rehabilitation, and time savings explain its popularity. Besides time reduction, this protocol leads to less discomfort and economic benefit to the clinician (2).

In addition to immediate loading, the delivery of a fixed implant-supported prosthesis at surgery time promotes immediate improvement of phonetic, masticatory capability, and physiological and psychological comfort (3). The technique of denture conversion was described as one option for delivering a fixed prosthesis at surgery time (4).

This case report presents a novel, more precise, and time-saving denture conversion technique to transform a muco-supported complete denture into a fixed implant-supported prosthesis.

CASE REPORT

A male patient without systemic changes, completely edentulous in the maxilla and presenting implant-supported prosthesis in the mandible attended the ILAPEO College Dentistry clinic complaining of instability in the upper conventional denture (Figure 1). After panoramic radiography and cone beam computed tomography analysis, it was decided to place six dental implants through guided surgery in the regions of 12, 14, 16, 22, 24, and 26 teeth (Figure 2).

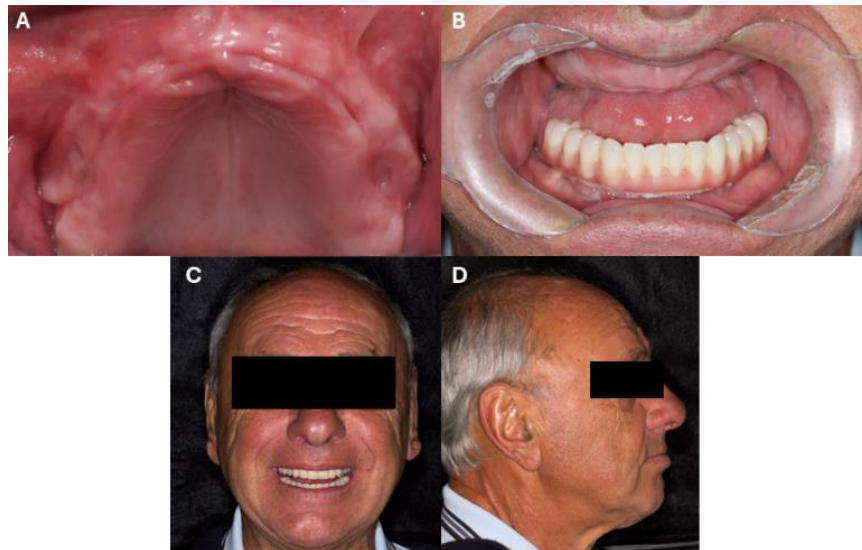


Figure 1 – Patient's initial condition. (A, B) intraoral view; (C, D) external view.

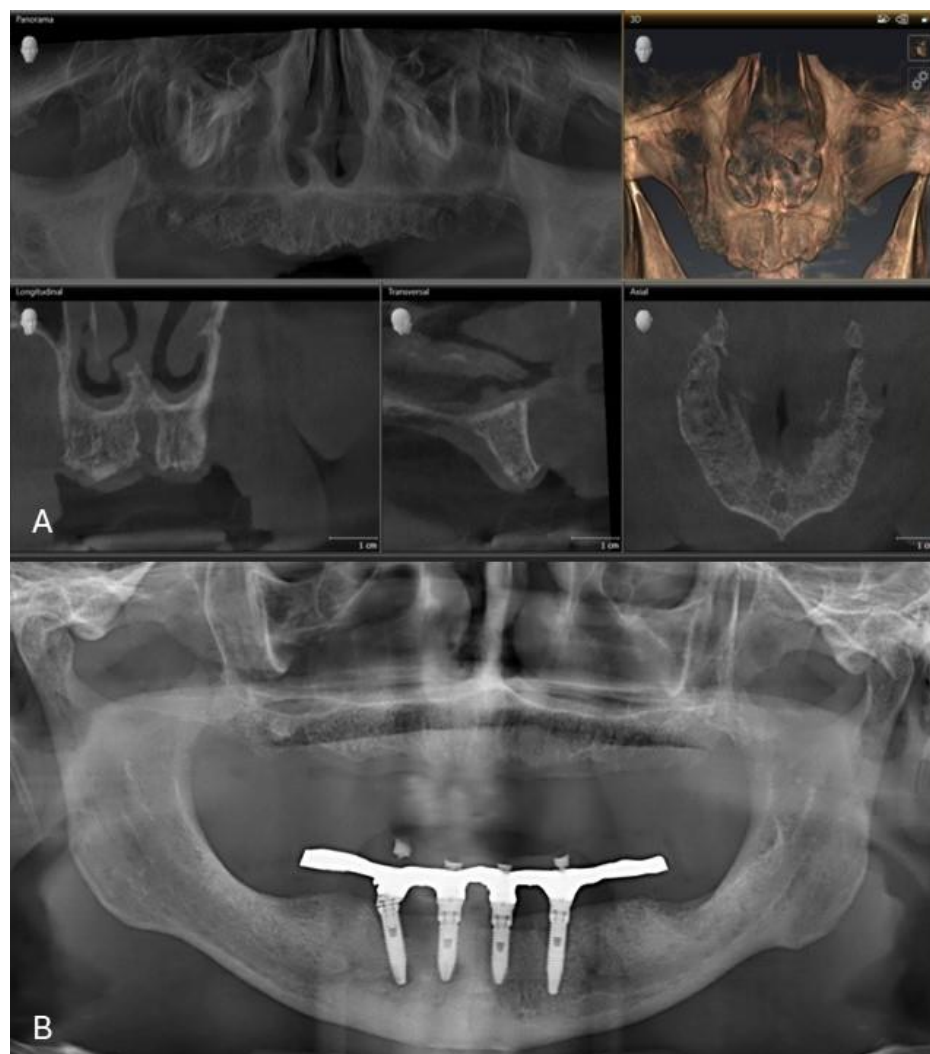


Figure 2 – (A) Initial CBCT images. (B) Initial panoramic x-ray.

The flapless guided surgery was planned using CoDiagnostix software (DentalWings, Canada) and considering using the Easy Guide® Kit (Neodent, Curitiba, Brazil) (Figure 3). One Helix GM® Implant 4.3x10 mm (Neodent, Curitiba, Brazil), one Helix GM® Implant 4.0x10 mm (Neodent, Curitiba, Brazil), two Helix GM® Implant 3.75x11.5mm (Neodent, Curitiba, Brazil), one Helix GM® Implant 4.3x8mm (Neodent, Curitiba, Brazil), and one Helix GM® Implant 4.0x8mm (Neodent, Curitiba, Brazil) were placed in maxilla using an impressed surgical guide. All implants achieved at least 32 N.cm of insertion torque, allowing immediate loading. GM Mini Conical Abutments 4.8x2,5mm and 4.8x3.mm were installed on implants with a torque of 20 N.cm (Figure 4).

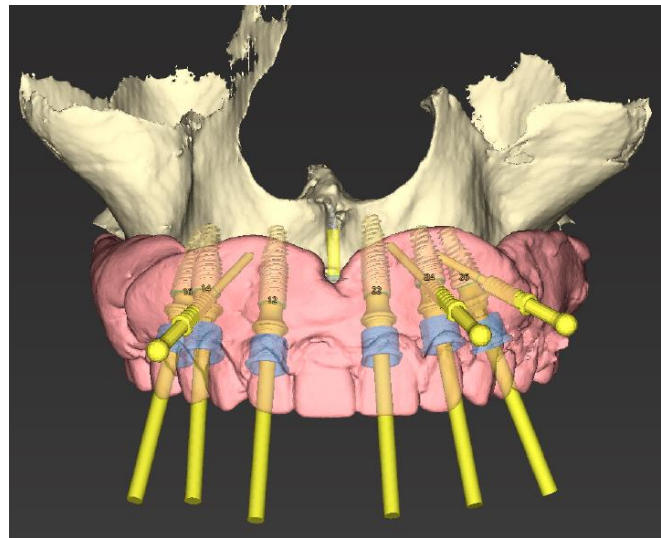


Figure 3 – Implant positions planned in CoDiagnostix software.

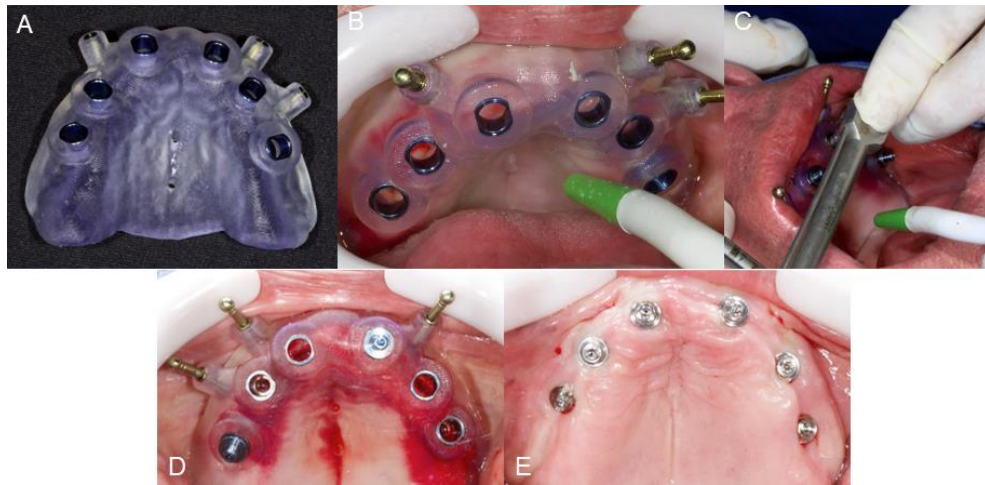


Figure 4 – (A) The surgical guide; (B) The muco-supported surgical guide positioned with the pines; (C) Implant placement using torque wrench; (D) Occlusal view; (E) Implants placed with GM Mini Conical Abutments.

Immediately after placing the implants and components, the six implants were captured using the same denture the patient was already using. To initiate the conversion procedure Mini Conical Abutment Copings NeoConvert with the Pin Capture NeoConvert (Neodent®, Curitiba, Brazil) were installed on the Mini Conical Abutments. The torque was applied using the Digital Driver Pin Capture NeoConvert (Neodent®, Curitiba, Brazil) until its torque control mechanism activated, which limits the maximum torque to 10 N.cm (Figure 5).

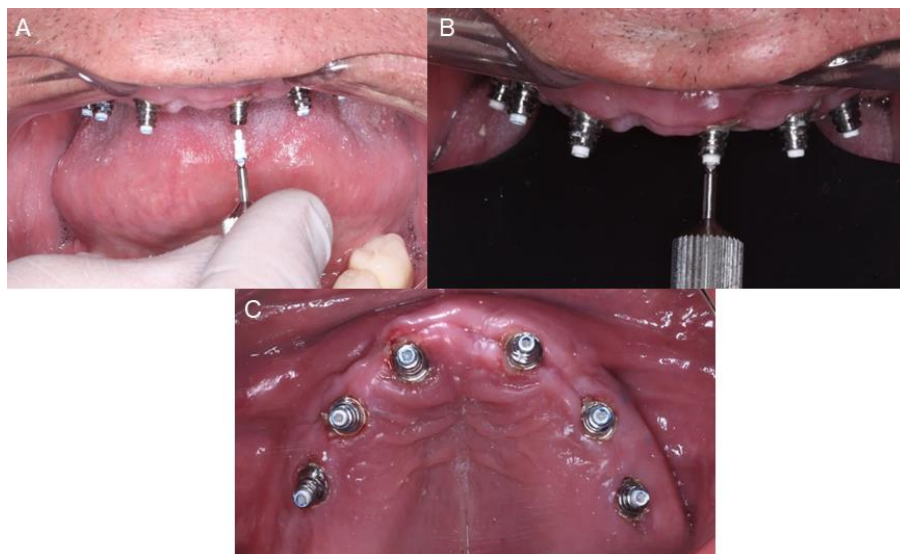


Figure 5 – (A, B) Placement of the Mini Conical Abutment Copings and the Pin Capture using the Digital Driver Pin Capture; (C) Occlusal view of the Copings installed.

Following, the denture preparation was performed. Markers were performed to identify the cavities' correct positions. Cavities over the position of the Mini Conical Abutments were formed using the Preparation Drill Handpiece NeoConvert (Neodent®, Curitiba, Brazil) until there was enough space for the Coping and the resin filling. Acrylic resin was applied over the Mini Conical Abutment Coping and into previously formed cavities. The prosthesis was placed in the mouth, with the acrylic resin still in the plastic phase, and the patient was instructed to close their mouth. During the waiting time for the final setting time of the acrylic resin, with the help of a spatula, a lever movement was carried out with support in the posterior region of the prosthesis to detach the fixation pins, enabling the removal of the prosthesis (Figure 6).

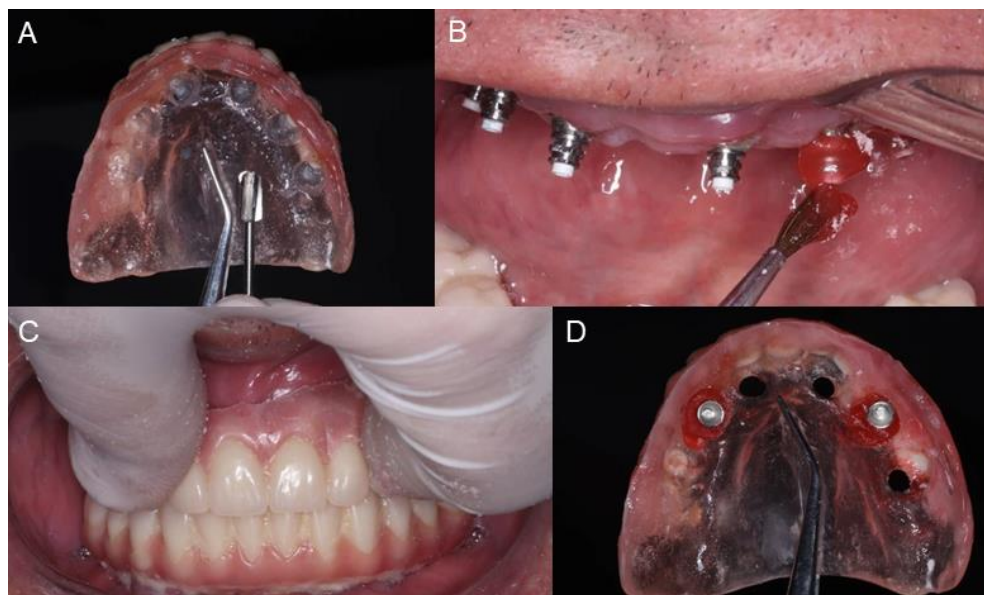


Figure 6 – (A) Drilled denture; (B) Application of acrylic resins over the Mini Conical Abutment Coping; (C) Patient in occlusion to coping capture not to lose the occlusal reference; (D) Prosthesis with copings captured.

The prosthesis detached from the mouth carried the Pin Capture NeoConvert inside each Mini Conical Abutment Coping NeoConvert. Next, the Drill Guide for Handpiece 1.5mm NeoConvert was used, positioned inside of the prosthesis and fitting exactly into the base of each cylinder. The first drilling was carried out in the direction from the internal to the external portion of the prosthesis, using the First Drill Handpiece NeoConvert inserting until the “stop” of the same. Next, the Second Drill was used in the same direction to increase the drilling diameter. Finally, the Third Drill was used in

the opposite direction, from the external part towards the internal part of the prosthesis, to complete the construction of the chimney, allowing the Neo Mini Conical Abutment Coping Screw Ti 4.1mm to be inserted. Next, the Mini Conical Abutment Polishing Protectors were placed on the base of the cylinders to begin the step of excess removal, finishing, and polishing of the prosthesis, always maintaining the internal design of the prosthesis in a non-retentive way to promote hygiene (Figure 7). Once finishing was completed, the prosthesis was installed, and final occlusal adjustments were performed (Figure 8).

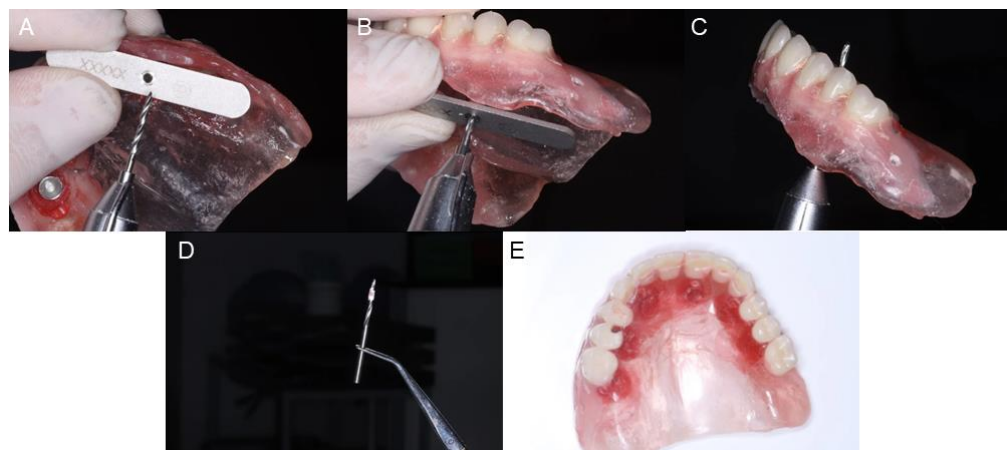


Figure 7 – (A) Use of the First Drill Handpiece NeoConvert; (B) Use of the Second Drill NeoConvert; (C) Use of the Third Drill NeoConvert; (D) Image of the drill with the Pin Capture removed; (E) Prosthesis conversion finished and ready for the palatine part removal.



Figure 8 - Patient's condition after converted prosthesis installation.



DISCUSSION

Immediate loading was the loading technique chosen for this case report. This protocol is already well-established, and meta-analysis studies showed no significant differences between immediate and conventional loading regarding implant survival and marginal bone loss at 2, 3, and 5 years of loading (5,6). Additionally, Belser et al. (7) indicated that, under optimal conditions, immediate loading results are comparable to delayed loading.

This case report applied virtual planning and guided surgery to improve the patient's experience and avoid surgical complications. Guided surgery is a challenge in fully edentulous patients due to the lack of reference points in the image exams, and the fit of the guide is more complicated in these patients because of the possible mobility and potential compression of the soft tissues (8). However, the use of guided surgery in this case report was successful. Besides the challenges, this technique has advantages and leads to a shorter surgical time and less intraoperative and postoperative morbidity (9).

The NeoConvert™ technique allows the patient to receive the fixed implant-supported prosthesis on the same day of the surgery. Additionally, as this technique uses the patient's complete denture to deliver a temporary fixed prosthesis, it is a financial advantage for patients since manufacturing a new prosthesis can cost extra money. In the chair-side technique presented in this case report, the clinician can convert the denture in a few minutes, which is an advantage.

The denture conversion process has some challenges. One of the most critical procedures is drilling the access holes since if you perforate the prosthesis in the wrong position, a large part of the denture will need to be removed (10). To overcome this critical point, the NeoConvert™ solution offers a kit of drills and a step-by-step orientation, as shown in this case report.



CONCLUSION

NeoConvert™ is a novel, functional, and predictable technique for converting a patient's complete denture into a fixed implant-supported prosthesis. Additionally, it offers an easy and economical option for patients and clinicians.

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