

Tooth-Implant Supported Fixed Dental Prostheses. Case Report.

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Abstract:

Background: In general, treatment with a tooth-implant-supported prosthesis is as predictable as with a fully implant-supported prosthesis. We present a clinical case of a tooth-implant-supported fixed dental prosthesis.

Clinical case: 54-year-old man, who came to the dental clinic in December 2024 to place an implant in position 16. An orthopantomogram showed a severe bone deficiency in area 16 and a fixed metal-porcelain bridge supported by two implants in positions 14 and 15. The patient did not want guided bone regeneration, so it was considered to rehabilitate the area with a metal-porcelain bridge supported by tooth 17 and implant 15. It was screwed onto implant 15 and cemented with a self-adhesive resin on tooth 17.

Discussion: Placing a prosthesis on an implant and a tooth simultaneously is not a complication, but it can be a drawback because they have different functional characteristics. The implant is rigidly integrated into the bone, while the tooth has micromobility within the dental alveolus due to the presence of the periodontal ligament. In the clinical case we present, there are anatomical and personal reasons that justify a combined tooth-implant fixed prosthesis. However, the success rate could be lower than with a fixed prosthesis on implants alone.

Conclusion: A combined tooth-implant fixed prosthesis can give excellent results, even when the implant and tooth have different functional characteristics. However, we recommend a combined tooth-implant prosthesis only when there are anatomical or other reasons that justify it.

Keywords: implant; tooth; prosthesis; screwed; cemented.

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I. Introduction

Dental implants are available in different designs, with different surface characteristics, and have been developed for different clinical situations [1]. When different implants were studied, no evidence was found that one implant system was superior to another [1]. Conventionally, it is preferred to keep implants unloaded during the healing period to improve osseointegration. Data suggest that immediately loaded implants fail more frequently than conventionally loaded ones [2,3].

Regarding the way to fix the prosthesis on implants, it has been described that cementation on a prefabricated abutment is possibly the most used [4,5]. Cement-retained implant crowns are considered more esthetic than screw-retained implant crowns, as they do not have an access hole [4]. Screw-retained implant crowns have the advantage of minimizing the risk of peri-implantitis and are easier to remove [4]. The latter makes it easier to repair, or replace the crown in case of porcelain fracture [4]. When teeth and implants are joined with a fixed prosthesis, the most important risk factor is the cement used to fix the prosthesis and the chipping of the prosthesis ceramic [6]. The highest complications occurred when teeth had undergone endodontic treatment [7]. When the prosthesis between implants and teeth had a non-rigid connection, intrusion of the abutment teeth was found in 5% of cases [8,9]. The cause of this intrusion is unknown [10] and is avoided by making this connection rigid [8].

When fixed partial dentures supported by implants and those supported by teeth and implants were studied, it was found that the tooth-implant connection has no negative influence on the success rates over 10 years, so a prosthesis supported by both a tooth and an implant can be recommended [11]. Some authors indicate that treatment with a tooth-implant-supported prosthesis is as predictable as with a fully implant-supported prosthesis [8], as has been demonstrated in longitudinal studies [10,12]. In the case of rehabilitating an area of up to three missing teeth, they recommend making a bridge on two implants [13] and if the connection is between implants and natural teeth, it should be rigidly constructed with a maximum number of four units [14].

The clinical case of tooth-implant-supported fixed dental prostheses is presented below, in which it was screwed onto an implant and cemented onto the natural tooth with a self-adhesive resin.

II. Clinical Case

54-year-old man, who comes to the dental clinic in December 2024 to place an implant in position 16. He had lost that tooth three years earlier due to a fracture. As a previous background, in October 2012 we had placed implants in positions 14 (Bego RI line 4.1 x 10) and 15 (Bego RI line 4.1 x 8.5), which were joined with a fixed metal-porcelain bridge in April 2013. To evaluate the possibility of replacing lost tooth 16, an orthopantomogram was requested. This showed a severe lack of bone in that area (fig. 1).

This impeded placing an implant, and the patient did not want guided bone regeneration. Therefore, it was considered to rehabilitate the area by placing a metal-porcelain bridge supported by tooth 17 and implant 15. To do this, the fixed bridge 14-15 was cut, leaving crown 14 on its implant. Tooth 17 was prepared (fig. 2) to make a tooth-implant-supported 17-15 bridge (fig. 3).

When the metal prosthesis was tested, it was found that the fit was excellent (Fig. 4). One week later, the fixed metal-porcelain prosthesis was screwed onto implant 15 and cemented with a self-adhesive resin on tooth 17 (Totalcem, Itena, France). The hole in the crown of implant 15 was closed with a Teflon insulator and composite (Zucrino, Prime Dental Manufacturing Inc, USA) (Fig. 5).

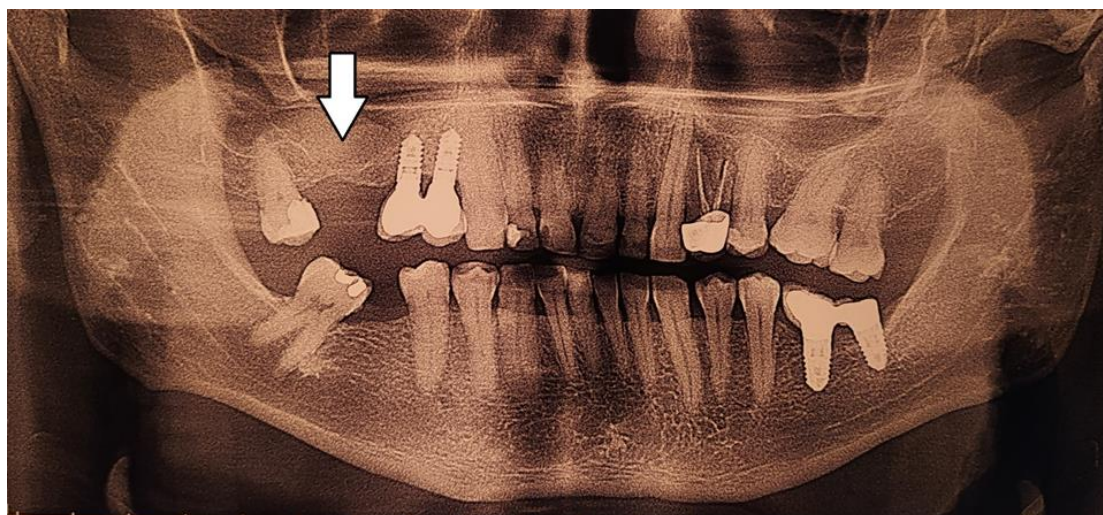


Figure 1. Pre-Treatment Orthopantomography, With Lack Of Bone In Zone 16.



Figure 2. Preparation Of Tooth 17 For Making A Tooth-Implant Supported Bridge 17-15.

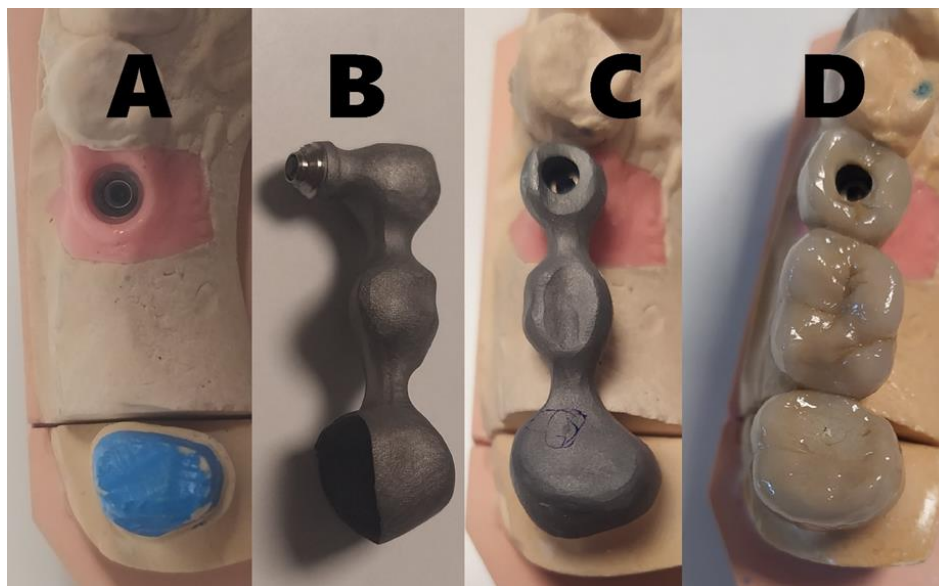


Figure 3. Image Of The 17-15 Tooth-Implant Supported Metal-Porcelain Bridge In Different Phases (A-D).



Figure 4. Testing Of The Metal Prosthesis On Tooth 17 And Implant 15.



Figure 5. Final Placement Of The Tooth-Implant Supported Fixed Dental Prostheses Metal-Porcelain.

III. Discussion

Success in implant placement depends on biocompatibility, patient factors, implant design, material, tissue health, bone quality and quantity, procedural issues such as insertion torque, healing duration, biomechanical loading, loading moment, and prosthetic design [15,16].

In dental implantology, there may be mechanical complications such as porcelain or resin fracture, loosening or fracture of the prosthesis screw, loosening or fracture of the abutment screw, and implant fracture [17,18,19]. This is due to material fatigue and/or corrosion [20], or due to lack of passive adaptation between the prosthesis and the implant. There may also be clinical complications of a nervous or vascular nature, or due to invasion of the maxillary sinus [21,22,23]. Placing a prosthesis on an implant and a tooth at the same time is not a complication, but it can be an inconvenience.

Some authors found no differences between prostheses supported by teeth and implants and those supported only by implants [8,10,11,12,24]. However, there are more complications when in a fixed prosthesis supported by teeth and implants, those teeth have undergone endodontic treatment or have a reduced insertion level [24]. The passive fit of the prosthesis is very important to minimize inadequate forces. This could reduce the complications associated with having that tooth undergone root canal treatment. In addition, it has been described that combined fixed partial prostheses supported by teeth and implants had a 90.1% success rate at 5 years of follow-up and 82.1% after 10 years [9], with almost 35% being able to fail over 20 years [25]. Although combined fixed prostheses supported by teeth and implants are an alternative treatment, it is recommended that only implant-supported fixed prostheses be used, unless anatomical or other reasons justify the use of implant-tooth-supported reconstructions [9]. This is because the tooth and implant have different functional characteristics. The implant is rigidly integrated into the bone, while the tooth has micromobility within the dental alveolus due to the presence of the periodontal ligament. In the clinical case, we present, there was not enough bone to place an implant in position 16 and the patient did not want to do guided bone regeneration either. These anatomical and personal reasons justify the development of a combined tooth-implant fixed prosthesis, although the success rate could be lower than in a fixed prosthesis solely on implants.

IV. Conclusion

The clinical case presented allows us to point out that a fixed prosthesis on combined teeth-implants can give excellent results, even though implant and tooth have different functional characteristics. However, we recommend combined teeth-implant prosthesis only when there are anatomical or other reasons that justify it.

Conflict Of Interest

There is no conflict of interest.

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