

Dental agenesis treated with SLActive implant: Case report

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Abstract

Dental agenesis is a genetic abnormality characterized by total absence of one or more teeth. It affects about 6% of the population, affects preferably the second mandibular premolar and represents a challenge for rehabilitation because it leads to functional and esthetic problems. Currently, dental implants play a prominent role in rehabilitation, and the SLActive® implants stand out because they accelerate osseointegration, shorten it to 21 days, and ensure better quality of new bone around the implant. With high rates of success even when immediate or early loading is used, these implants have revolutionized modern Implantology. This report describes a case of dental agenesis of the second mandibular premolar treated using a SLActive® implant and a final prosthetic crown installed on the fifth postoperative week.

Keywords: Implant surface. Osseointegration. SLA modified surface.

How to cite this article: Gonçalves AGB, Thiegi Neto V, Nogueira AS, Assis DSFR, Nary PE, Gonçalves ES. Dental agenesis treated with SLActive implant: Case report. *Dental Press Implantol.* 2012 July-Sept;6(3):105-10.

» The authors inform that they have no associative, commercial, intellectual property, or financial interests representing a conflict of interest in products and companies described in this article.

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Submitted on: December 12, 2011
Reviewed and received on: May 24, 2012

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Introduction

Dental agenesis, the congenital absence of one or more teeth,¹ has a prevalence of 2% to 10% in the permanent dentition² and affects 6.3% of the Brazilian population.¹ Except for the third molar, the second mandibular premolar is the most often missing tooth (21%).³

The congenital absence of one or more teeth in the permanent dentition generates functional and aesthetic disorders, and rehabilitation by replacement of the missing tooth is necessary. Among rehabilitation options, the fixed-implant supported prostheses hold a prominent place. Dental implants with treated surfaces are used to ensure better implant-bone contact, higher quality of bone formation and faster osseointegration.

Currently, highly hydrophilic and energized surfaces promote osseointegration and have high indices of bone-implant contact⁴ at short postoperative times (2 to 4 weeks)⁵ and success rates between 98.2%⁶ and 97.7%,⁷ even when loaded within 21 days of implantation.

This report describes a case of agenesis of the second mandibular premolar treated using a SLActive® surface implant and a final prosthetic crown installed on the fifth postoperative week.

Case report

A 27-year-old white woman presented with a complaint of presence of a deciduous tooth in the right mandibular posterior region. Clinical (Fig 1) and radiographic (Fig 2) examinations showed that the mandibular deciduous second molar was present in the dental arch with no mobility, with gingival recession in the region of the mesial root, which was reabsorbed and surrounded by a translucent area of undefined limits, and with no permanent successor.

We chose to remove the deciduous tooth and install a SLActive® implant immediately. The extraction occurred after anesthesia by regional block of alveolar inferior, buccal and lingual nerves with injection of 1.8 ml of 4% articaine hydrochloride with 1:100,000 epinephrine, after which a sulcus incision was performed with a 15c blade to ensure conservative and minimally traumatic gingival detachment. The deciduous tooth was extracted using a 304 apical extractor. After tooth extraction, curettage was performed on the surface of the dental alveolus, especially in the mesial root area.

A Straumann SLActive® SP RN 4.1 x 10 (Figs 3 and 4) was implanted immediately after tooth extraction, following the sequence of drills recommended by the manufacturer. The gingiva was sutured with 4-0 Vicryl. The insertion torque was 35 N/cm.

The patient received 100 mg nimesulide and 1 g amoxicillin, both orally, one hour before the procedure; 200 mg nimesulide per day was administered for three days postoperatively.

The suture was removed on the 10th postoperative day; on the 21st day, the 1.5 mm cover screw was replaced with a 3 mm high healing screw (Fig 5). On the 30th postoperative day, molding procedures and crown manufacture (Figs 6 and 7) began. After the plaster model was ready (Fig 8), the manufacture of the final prosthesis began (Fig 9).

Five weeks after implantation, the final metal and ceramic crown were screwed to the 1.5 mm high SynOcta abutment (Figs 10 and 11). There were no painful symptoms after installation of the implant or during prosthetic procedures. The patient has been under clinical and radiographic follow-up for 3 years (Figs 12 and 13).



Figure 1 - Clinical aspect of deciduous tooth.

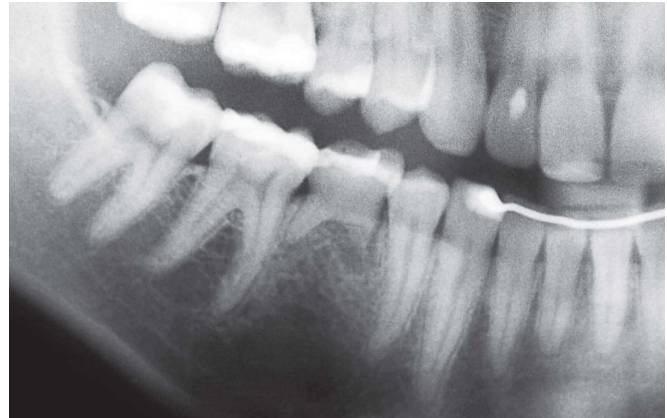


Figure 2 - Radiographic appearance of deciduous tooth and underlying bone.

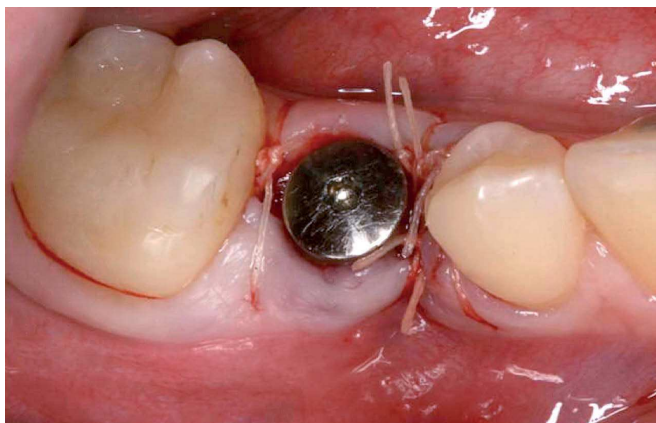


Figure 3 - Dental implant in position. Photograph shows 1.5 mm high cover screw and sutures after deciduous tooth removal and implant installation.

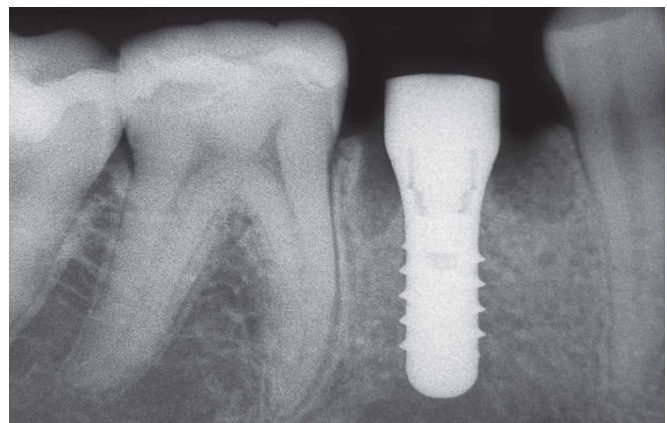


Figure 4 - Postoperative radiograph shows implant installed immediately after extraction of deciduous teeth.



Figure 5 - Clinical aspect after 30th postoperative day with 3 mm high healing screw.



Figure 6 - Clinical aspect after 30 implantation days showing implant platform without 3 mm high healing screw.



Figure 7 - "Snap-on" impression component installed.

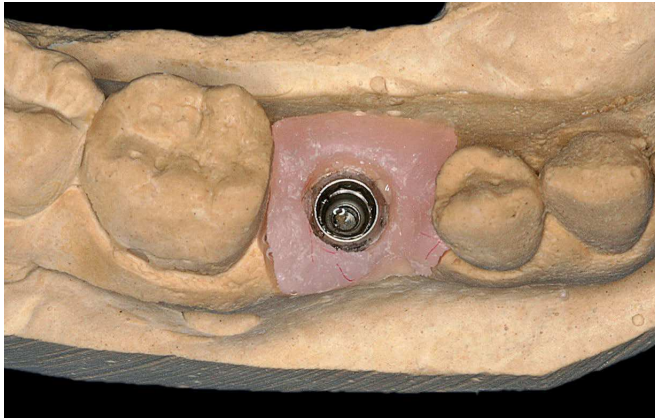


Figure 8 - Occlusal view of partial gypsum model.

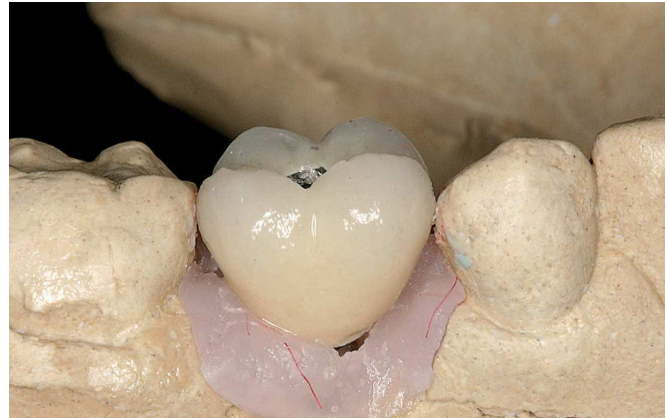


Figure 9 - Final metal and ceramic crown.

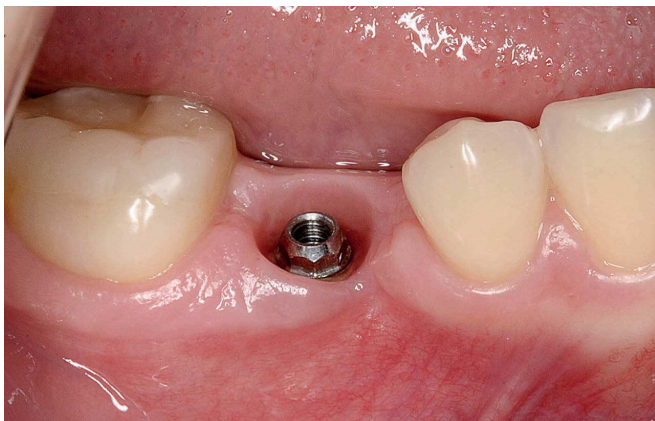


Figure 10 - SynOcta abutment of 1.5 mm high screwed to SLActive® implant.



Figure 11 - Final metal and ceramic crown screwed to 1.5 mm high SynOcta abutment (five weeks).



Figure 12 - Clinical aspect at three years' follow-up.



Figure 13 - Radiographic appearance at three years' follow-up.

Discussion

According to Pannu et al² dental agenesis is one of the most common genetic abnormalities among human beings. It occurs in 6.3% of the Brazilian population¹ and affects preferably the second mandibular premolar.³ The case reported here properly fits this context.

The total absence of a tooth (especially a permanent tooth) is an esthetic and functional difficulty for the individual with such anomaly. The restoration of the missing tooth — or teeth — using a dental implant has become a consolidated treatment method in modern dentistry. Excellent clinical outcomes and major changes in the initial concepts, recommended by Adell et al⁸ and Schroeder, Pohler and Sutter,⁹ have corroborated this consolidation.

Technological advances, especially in dental implant surfaces have contributed to the achievement of higher success rates. In this context, we draw attention to the SLActive[®] surface, which has the same surface topography as the SLA,¹⁰ but differs from it as it is wrapped under a nitrogen atmosphere and stored in a sodium chloride isotonic solution. Such procedure changes its molecular features so that it becomes highly energized and hydrophilic. Therefore, it potentially attracts and facilitates the contact of blood cells and molecules,

and thus promotes faster¹¹ and better¹² osseointegration. High levels of success are achieved when implants are subjected to loads after 21 days of implantation,¹⁰ or even when immediate loads are applied over poor quality bone (posterior area of mandible or maxilla).¹³

In the case reported here, we chose the SLActive[®] surface because of the factors mentioned above, which would ensure faster and better osseointegration and reduce the risk of implant loss and the discomfort of the deciduous tooth absence. We opted for this surface because of the minimum bone loss associated with it, even in longer follow-up times and short implants.¹⁴ The clinical and radiographic features at 3 years' follow-up (Figs 12 and 13) confirmed the successful results, as bone is seen in the cervical region of the implant, in contrast with the radiographs taken immediately after the implant (Fig 4). These findings, moreover, are associated with little or no cervical bone loss.

Our report shows that technological advances in implant surfaces are relevant for the development of Implantology, and that the SLActive[®] surface has an innovative concept of quality, with good results even under adverse conditions and shorter times to achieve osseointegration and patient rehabilitation.

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