

Linkows' Blade-Vent Implants Continue to Work After Twenty-Nine Years: Case Report*

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ABSTRACT

Summary.

We report a case of two osseointegrated Linkows' blade-vent implants [1] supported fixed partial dentures that still osseointegrated at the mandible of 54-year-old patient during last twenty-nine years. The purpose of the report is to compare the bone condition around the blade-vent implants, condition of the fixed dentures, and two abutment teeth. Benefits and disadvantages of Linkows' blade-vent implants are also highlighted [24].

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Introduction

Endosseous blade-vent implants (*related names*: blade implants, Linkow-type blade implants, Linkow-type blade vent implants) were introduced by American dentist and pioneer in the field of oral implantology Leonard Linkow in 1968 [1, 2]. First 2 year follow-up results were presented by him in 1970 [3]. The whole next five decades is a period that shows a transition from wide blade-vent and subperiosteal implants usage to root-form and zygomatic implants usage not only into jaws but also into flap-reconstructed mandible/maxilla [4, 5]. A lot of publications show that, despite of disadvantages, blade-vent implants continue to work in the long time follow-up period [6-20]. One of them is Pasqualini and Pasqualini (2003) publication, who reported a success rate of 91% at 10 years for 386 blade implants placed between 1971 and 2009 [2, 7]. Risks and benefits of connecting an implant and natural tooth were precisely described by Brägger *et al* (2001), Cordaro *et al* (2005), Nickenig *et al* (2006), and Davis *et al* (2014) [21-24]. Our case represents a unique comparison of long-

term usage of two tooth-blade-vent-implant supported fixed partial dentures with different conditions of denture-supported teeth (endodontically treated vs non-treated).

Case Presentation

A healthy 54-year-old lady referred to the Center of Maxillofacial Surgery for a one month history of movement of one of the fixed partial dentures. Out-office oral examination revealed a non-significant mobility of an anterior part of tooth-implant fixed partial denture in area of tooth 3.4 (Figs 1 and 2B) and signs of gingival inflammation in the area of contact of the movable part of the denture near root of the tooth 3.4. Mobility of the denture was caused by the destruction of crown of the abutment teeth 3.4 by caries. The tooth-implant fixed partial denture on the opposite site shows no mobility and symptoms of gingival inflammation.

A panoramic radiography (Figs 1, 2) shows two blade-vent implants with the tooth-implant supported fixed partial dentures. A good bone level at the alveolar ridge in areas of inserted blade-vent implants was noted. According to patient medical history the two blade-vent implants (there was no precise data about manufacturer; implants material is presumably titanium, taking into account the production capacity in the late 1980s and the longevity of these two implants) placement and prosthetic work were performed in 1986 at Department of Prosthetic Dentistry, Bogomolets National Medical University (Kyiv, Ukraine). Endodontic treatment of the tooth 4.4 was performed simultaneously with blade implants placement. At maxilla

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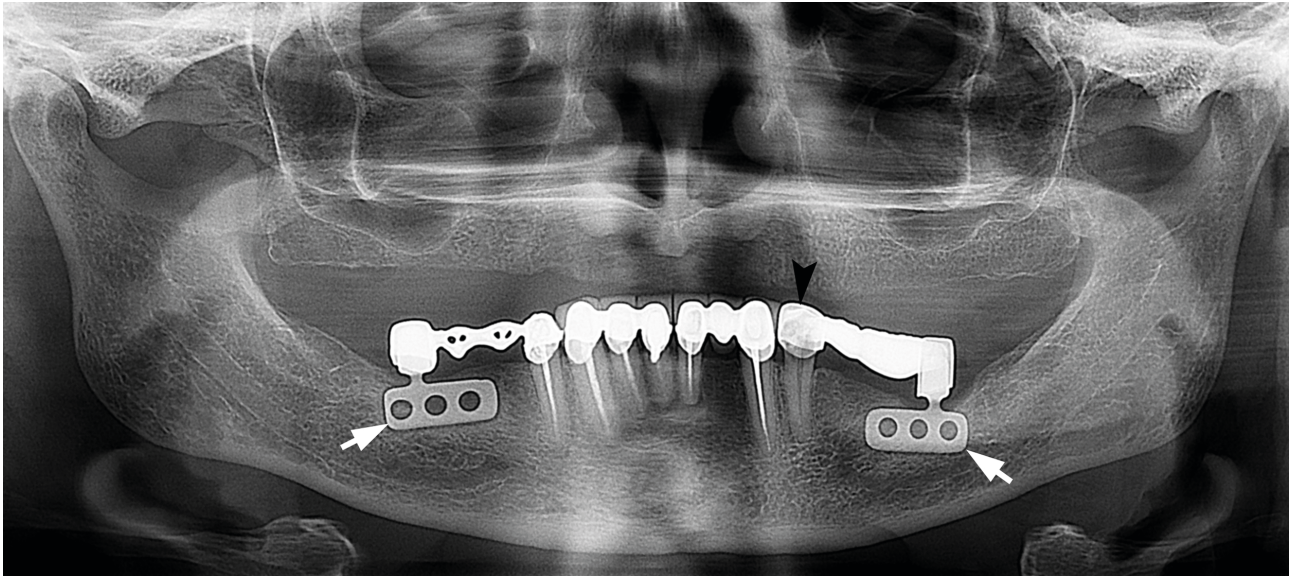


FIGURE 1. A panoramic radiograph of 54-year-old lady after 29 years of the blade-vent implants (arrows) placement. Notes the mobility (arrowhead indicates direction of mobility) of fixed bridge (cement fixation) on the tooth 3.4. Oral examination revealed a destruction of the crown part of tooth 3.4 with caries to the level of tooth neck. Radiograph shows no radiopaque filling material inside a root canal of tooth 3.4. No crestal bone resorption or peri-implant radiolucencies are present.

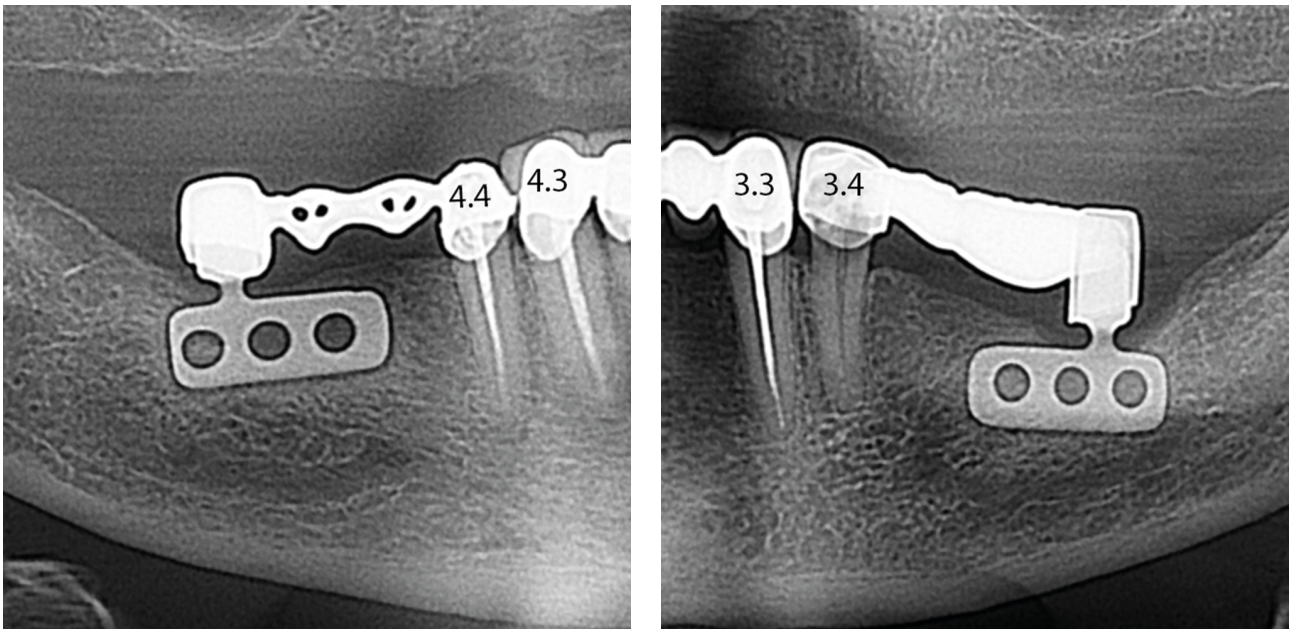


FIGURE 2. A cropped and zoomed panoramic radiograph of the same patient. The teeth are indicated by numbers. (A) Tooth-implant fixed partial denture on the right side. Denture is fixed at endodontically treated tooth 4.4. (B) Tooth-implant fixed partial denture on the left side. Denture is fixed at non-treated tooth 3.4.

a patient used a fully removable denture during the whole period of dental implants function at the mandible.

The condition upon oral examination and panoramic radiography clearly demonstrate us the need of tooth 3.4 treatment with possibility to use it as abutment tooth further in new tooth-implant supported fixed partial denture.

Discussion

Naert *et al* (2001) [25] in their study of 339 implants fixed

to 313 abutment teeth, shows that complications with the implant-tooth group included: periapical lesions (3.5%), tooth fracture (0.6%), extraction (decay or periodontal disease) (1%), intrusion (3.4%), and cement failure (8%). Davis *et al* (2014) [24] argued about the next advantages of a tooth-implant supported fixed partial dentures: 1) increased tactile perception; 2) greater chewing comfort and efficiency; 3) avoidance of vital structures; 4) reduced cost; 5) reduced need for advanced graft; 6) improved patient acceptance.

Thus, upon the planning of the tooth-implant supported fixed partial dentures the next risks [24] cannot be ignored: 1) intrusion of natural tooth; 2) biomechanical complications: fixture-abutment failure, loss of retention, screw loosening/implant fracture (implant, especially risk is high in the neck of blade implants [26], cement failure (implant/tooth), fracture (tooth), caries (tooth), crown fracture; 3) loss of natural tooth: endodontic involvement, fracture, caries, periodontal disease; 4) peri-implantitis.

Conclusion

The twenty-nine years of two blade-vent implants function in implant-tooth fixed dentures confirms: 1) a possibility of blade implants to perform function; 2) to be a long-term period successfully osseointegrated; 3) to have insignificant bone resorption around the implants, showing no alveolar ridge atrophy; 4) a tooth-blade-vent-implant supported fixed partial denture can long-term exist in case of healthy/perfect endodontically treated abutment teeth.

And we are completely supporting an opinion of Davis *et al* (2014) [24] that for the sake of increasing predictability, cases for combination tooth-implant supported FPDs should include ideal proposed implant location, healthy natural/endodontically treated abutment teeth, and excellent patient factors such as occlusion, oral hygiene, and motivation.

Conflict of Interest

The authors declare no conflict of interest.

Role of the Authors and Co-authors

Zinaida Y. Zhehulovych (editing)

Ievgen I. Fesenko (material collection, concept of a paper, and editing)

Nadim S. Al-Makhamid (material collection and writing)

Ethical Approval

No needed.

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