Cranio-maxillofacial

Implant Directions®

Vol.4 N° 2 September 2009

## CASE REPORT

# IMMEDIATE AND INTRA-ORAL REPAIR OF A FRACTURED BASAL IMPLANT

IHDE S.

ISSN 1864-1199 / e-ISSN 1864-1237

OFFPRINT

Published by IF Publishing, Germany

# Editorial board

**Single Issue Price**
Euro 30
**Annual Subscription**
Euro 120

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**CMF.Impl.dir.**
ISSN 1864-1199
e-ISSN 1864-1237

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## Case Report

# Immediate and intra-oral repair of a fractured basal implant

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## Abstract

When the cementation of large prosthetical workpieces fails in part, implant-borne bridges may nevertheless be considered stable from the patients point of view. However the stresses on those implants still holding the bridge gets considerably higher. This may lead to fractures of the implant and well integrated basal implants fracture supra-crestally in these cases.

This article shows and illustrates an easy to perform intra-oral repair technique for basal implants and discusses differences to the repair process of traditional dental implants.

Key words: Basal implants, Diskos® E System, implant fracture, intraoral repair process

## Introduction

Placement of integrated endosseous implants in the intra oral environment and the equipment with larger bridges is associated with one principal problem: the implant-and-bridge-systems are on average more stiff than the bone in which they are integrated. This leads to stresses within the implants, the bridgework and the connection area, i.e. the screw connection or the cementation. Typical failures of these devices are chipping ceramic veneers, broken frames of the bridge and broken prosthetical screws or implants.A large body of literature is available regarding the problems associated with broken crestal implants and prosthetical screws. If must be expected however, that, for various reasons, only a extremely small proportion of the existent problems ever get published.

Fractures in basal implants have been reported. Usually the authors do nit differentiate between different brands of implants and they do not differentiate between the types of fractures either. While fractures at the base plates in most cases require a replacement of the implant, intra-oral fractures of basal implant may be repaired. Before the year 2006 two-piece basal implants (Diskos® brand) were most popular in central Europe. After the year 2006 mostly BOI®-Implants were used and the later consisted out of one single piece only. The reason for this shift in the surgeons choice was, that it had finally been widely understood, that immediate loading was the most natural way of handling basal implants, and hence two piece designs were not really indicated any more. Unloaded healing times, during which the vertical implant parts required shielding from intraoral forces, had become unnecessary.

Two piece implants carry the risk, that the connection between the abutment and the implant may become lose. This may lead to uncontrolled load transmission between the bridge and the implants, und subsequently to high stresses in the connection area of single implants. As long as the implant is integrated firmly, fractures will occur in the intra-oral implant part ofthe implant or at bone level. These fractures can be treated easily and successfully.

## Material and Methods

The case reported here was initially treated five years before the implant fracture occurred. The circular bridge on four basal implants in the highly atrophic mandible had been placed in an immediate load procedure. A temporary cement had been used. After this the patient turned up for several appointments. During two of the last appointments a dentist not trained in the basal implant concept carried out the control and mentioned in the patient record, that the bridge had loosened. The dentist did not attempt to re-cement the bridge nor did he refer the patient to an authorized BOI-implantologist®. Hence the patient was left without the necessary treatment for a prolonged period of time and appeared in our office only, after the bridge had become completely mobile.

After the bridge was removed, it became clear, that the implant in the region of the lower left canine had fractured (Fig. 1). Subsequently (or before this) a partial fracture of the base plate of the implant in the lower distal right mandible had occurred, although (or also because) the bridge had not been rigidly cemented on this implant after the temporary cement had failed.

We decided to repair the anterior implant and leave the partially damaged distal implant in place, because due to the inclination of the distal implant (Fig. 5) we expected than an overall stable treatment result could be expected.

In order to repair the implant, the circular ring below the (broken off) thread had to be removed from the vertical implant part. This was done by using high speed instruments and a tungsten carbide bur (Fig. 2). By using the “TAP D” tool and a ratchet (RAT 2) in combination a new thread was cut onto the vertical implant part (Fig. 3).

It is advisable, to use this instrument only once, because the internal threads wear off. Due to the softness of the implant material, the threads are not really cut into the implant but the material is deformed and thereby it becomes more rigid. Before taking an impression for the new bridge, all other abutments were replaced as well. The patient was very happy with the clinical and functional result and also thankful that this repair was possible without replacing the complete implant.

**Discussion**

As more and more implants are being distributed into the population, problems during the maintenance phase are increasing in absolute numbers. Fractures of implants or accessory parts are not a rare event at all. While in conventional implants a fracture of the implant body itself is hardly treatable, crestal fractures of basal implants are indeed easy to treat, if the necessary tools are at hand.

It would even not have been necessary to replace the whole bridge in this case: Abutments with a prolonged neck (Types: TSD 44 and TSD 99) are available and they bridge the gap between the shortened implant and the bridge. The polished neck portion of these abutments allow their placement even below the gums-after the thread has been cut new. A thread height of 3 -4 mm has proven to be sufficient for a stable fixation of the new abutment. It is recommended to replace the abutment when a new thread is made into the vertical implant part, because it has to be expected, that the internal thread of the old abutment is damaged also.

Although every treatment provider strives hard to deliver excellent results, we have to admit openly, that a number of cases treated with implants develop problematic aspects. It is well known (and the reason for frequent discussions, arguments, and even lawsuits) that the patient`s perception and evaluation of the problem and its severity differs from the professional dentists point of view.

In general, patients expect that their problem gets solved quickly and in a professional manner. The normal patient accepts the occurrence of a problem as a natural run of his/her life. Patients also understand more and more today, that every surgery on the jaw bones (with the exception of bone augmentations and transplants) may result in a locally reduced bone volume. Therefore they try to avoid surgical interventions.

It has been discussed by, that problems which affect basal implant during the phase of usage lead to large bone losses. As this case demonstrates, the possibilities to repair basal implants are tremendous. In the same situation a screw implant would have been replaced completely, requiring at least one surgical intervention

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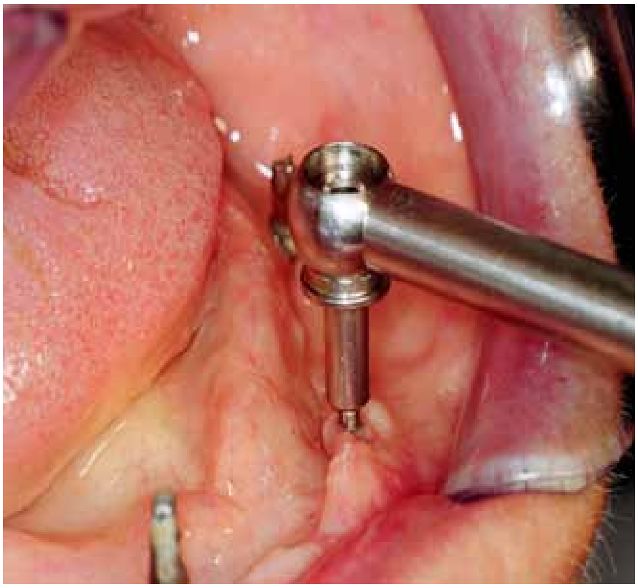
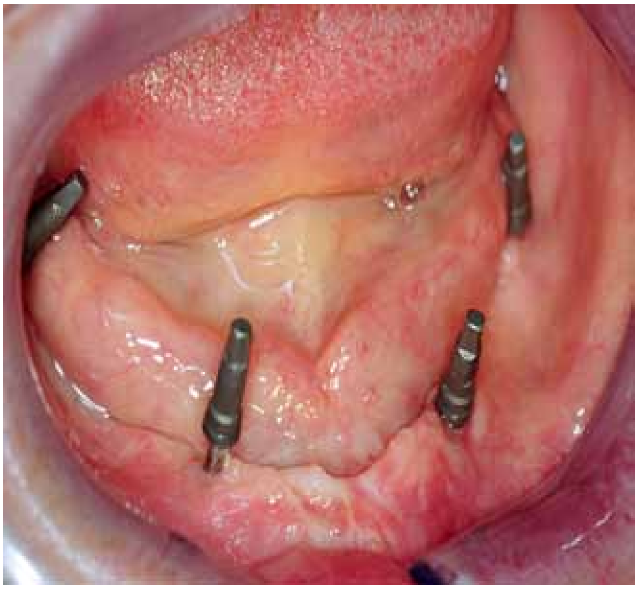
The external thread of a well integrated Diskos®-Implant had fractured off. Below the thread a thick, round/cylindrical neck portion is visible. This area represented a vertical stop for the abutment.

The neck portion has to be trimmed before the new thread may be cut.



The instrument TAP D in combination with the ratchet RAT2 is used to prepare a new thread onto the implant.

The new thread has been prepared over a length of about 3 – 4 mm. It is recommended to use a new TAP D instrument for each procedure of this kind.



All implants are equipped with new abutments before the bridge is manufactured. Note plaque accumulation at the implant in the area of the lower right canine: nevertheless the soft tissues are free from signs of infection. This is owed to the thin an polished design of the implants.