

# MINIS: ACCEPTANCE RISES

Established in practice, but often viewed with skepticism – for a long time that was the case for mini dental implants. However, in recent years, the reduced diameter (under 3mm) implants have increasingly attracted the attention of scientists. Corresponding studies to investigate the clinical feasibility of mini-implants have been initiated at numerous universities worldwide. | **PROF.DR. DR. NORBERT ENKLING**

**W**hile initially discussions about possibly higher loss rates of mini dental implants, danger of breakage u.Ä. Several studies and literature reviews today show that the success rates achieved are comparable to those of conventional implants [1-3]. Other current investigations were primarily based on the indication of the anchoring of full dentures in the edentulous jaw.

## IMPROVED QUALITY OF LIFE

One of the most important factors for assessing the suitability of a form of therapy is the satisfaction of patients with it. The satisfaction and the potential to improve the quality of life of those affected can be determined through direct questioning. The problems of total prosthesis wearers to be solved are already known: in particular the patients who are supplied with a prosthesis in the lower jaw frequently suffer from restrictions, e.g. in terms of food intake [4]. Malnutrition and increased susceptibility to disease can be the result. Frequently, these problems also lead to avoidance of social contacts.

## CONVENTIONAL IMPLANTS

One solution is the insertion of at least two conventional implants for prosthesis anchoring. Studies show that this results in a significantly improved quality of life compared to the conventional, purely mucosal-supported prosthesis [5-6]. For older patients, however, this form of therapy is



Ball-end mini-implant, replaceable O-ring and metal housing that can be machined into an existing prosthesis. If there is a loss of retention, the O-ring can be easily replaced.

only conditionally suitable [7]: Firstly, seniors often have concerns about the complex surgical procedure. On the other hand, it is questionable to what extent such a complex treatment, which often requires augmentation and a long healing time, is even recommended for older patients.

## MINI-IMPLANTS

Mini dental implants may be more suitable in seniors with reduced bone supply, as they generally require a much less invasive surgical procedure. Elderly patients also benefit from a shorter treatment time - often with immediate care - and low costs

## PILOT STUDY

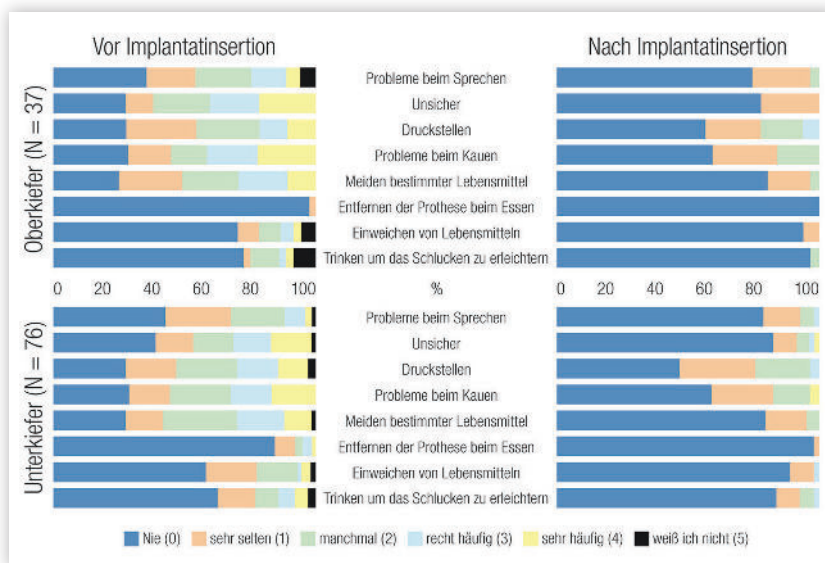
How the anchoring of full dentures with mini-implants affects the quality of life of the patient, has been described i.a. at the University of Montreal as part of a pilot study. Ten MDI mini-dental implants were inserted into the edentulous mandibular flapless and immediately loaded with a mucosa-supported and implant-retained prosthesis. All patients completed a questionnaire before the procedure and six months later. The results of the evaluation were presented as part of a poster presentation by Prof. dr. Shahrokh Esfandiari, Patricia Oliveira and Prof. dr. Jocelyne Feine presented during the Florida International Congress of Oral Implantologists 2012: The oral health-related quality of life improved

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MDI mini-dental implants are available in different diameters - 1.8 and 2.1 mm for use in the lower jaw and 2.4 and 2.9 mm primarily for the upper jaw. There are four different lengths between 10 and 18 mm available.

Results of the retrospective study in Greifswald regarding the change in quality of life (OHIP-G14 questionnaire and supplementary questions) [8]



Quelle: Mundt et al

significantly.

### RETROSPECTIVE STUDY

Similar results were confirmed by a retrospective study by the University of Greifswald [8]. There, 79 female and 54 male patients aged 48 to 100 years were clinically examined by nine independent dentists seven to 61 months after insertion of mini dental implants in the upper and / or lower jaw for prosthesis stabilization by an independent dentist. In addition, questionnaires were filled in by patients and records in the patient record were taken to collect data on the success rate, the quality of life change and the necessary maintenance measures for the prosthesis. A significant improvement in their quality of life was reported by 87.6 percent of patients. Studies by the Universities of Belgrade and Bern showed comparably good results [9-10].

### INFLUENCE ON BONE

Another important aspect to be examined with regard to the use of mini dental implants for anchoring complete dentures is the influence on the surrounding bone. It is reasonable to assume that due to the very small diameter of mini implants under load, other forces act on the peri-implant bone than when using conventional implants. At the same time, the loading concept when using mucosa-supported prostheses is different than with fixed dentures. Therefore, it is necessary to analyze

ze which processes in the bone are triggered by the immediate loading of the mini-implants. This was done in the context of a cohort study of the University of Belgrade, where the stability of the mini-implants and the changes in the peri-implant bone level were measured [11]. Thirty toothless patients aged 45 to 63 years each received four MDI mini-dental implants in the interforaminal area of the mandible, which were immediately loaded with full dentures. To measure the bone level, an individualized dental film holder was created to ensure exact repositioning in the patient's mouth. With this X-ray was performed immediately after implant placement and in the sixth week and in the fourth and twelfth month postoperatively. Average bone resorption was 0.4 mm at 12 months, which was clinically acceptable according to the authors of the study. Implant stability was assessed by Periotest values after implant placement, three and six weeks later and four, six and twelve months postoperatively. It showed that the primary stability decreased in analogy to the conventional implants until the sixth week before a significant increase in stability through osseointegration up to the twelfth month. The conclusion was that mini-implants allow for immediate loading when sufficient primary stability of 35 Ncm is achieved in the lower jaw. Furthermore, in a prospective study of the University of Bern and others. Factors of deterioration of prosthetic components studied [10]. Success rates, changes in oral health-related quality of life,

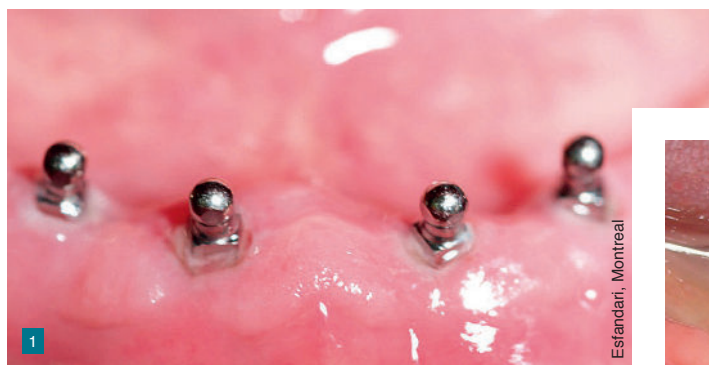
### LITERATURE LIST on dentalmagazin.de



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**1:** Clinical example: Four MDI mini-dental implants were placed in the lower jaw of this patient to anchor a full denture and provide improved denture support.  
**2:** Determination of the stability of a mini-implant with Periotest classic



and chewing performance were also collected. In order to test the wear, mini-implants were anchored in 20 patients to anchor a lower jaw prosthesis and the existing prostheses were reworked accordingly. To determine the wear, the retention forces of the matrices and the patrices were determined with a special measuring system immediately after implantation as well as four, eight, twelve, 26 and 52 weeks postoperatively. A slight decrease in retention force was found on the replaceable dies (this was 70 percent of the baseline value at 12 months), while the male dies showed no signs of wear. Accordingly, the wear behavior is considered good. The biting force of the patients increased steadily over time - it can be assumed that this fact is partly responsible for the low failure rate of the mini-implants.

## CONCLUSION AND OUTLOOK

The study results show that mini-implants are a treatment option that is well suited for the anchoring of complete dentures in the edentulous jaw. This also confirms a consensus statement of the ITI [12]. It is now important to scientifically investigate the use of mini dental implants for increasing the retention of partial dentures, which has been successfully implemented in dental practices for more than a decade. At the University of Greifswald under the leadership of PD Dr. med. Torsten Mundt has already initiated retrospective and prospective clinical trials (see Interview page 32 ff).



## MINI-IMPLANTS

The one-piece MDI mini-dental implants from are available in diameters from 1.8 to 2.9 mm and lengths from 10 to 18 mm. There are different designs (for example with and without collar) offered.

### Indications & Patient Selection

MDI Mini-Dental implants for the stabilization of total and partial dentures as well as the fixation of small bridges have been approved by the manufacturer. Their use in the indication of prosthetic anchoring is particularly recommended in older, anamnestic preloaded patients who have a low horizontal bone supply. There would be the use of conventional implants u.a. because of the complexity of the procedure and the need for augmentation associated with increased risk and time and cost. Mini implants, however, allow a less expensive surgical procedure, which often can be dispensed with a flap formation.

In the lower jaw, when a primary stability of 35 Ncm is reached, immediate loading through a mucosa-supported and implant-retained prosthesis is possible.

### Required know-how

Anyone who places mini-implants should have in-depth knowledge of dental surgery and anatomy. In addition, it is recommended to attend appropriate training sessions to introduce the MDI system and planning, surgical and prosthetic care procedures. In any case, the specific surgical and prosthetic protocol specified by the manufacturer must be followed exactly.