CE 0483

ISO 9001:2000, ISO 13485:2003
FDA Clear for marketing

17

News No.17 Feb. 2006

The incidence of marginal bone loss and failure rate of MIS internal hex implants bearing different types of prosthesis.

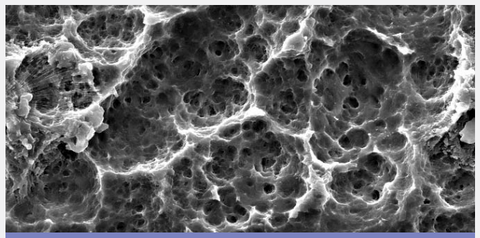
- A Long-term retrospective analysis.

*A poster presented in the EAO meeting, Munich 2005

MIS Implants Technologies Ltd.
Shlomi Industrial zone
P.O.Box 110 Shlomi 22832, ISRAEL
Tel: +972 (0)4 980 99 66
Fax: +972 (0)4 980 99 44

www.mis-implants.com

MC-N1726



Keep it Simple

The incidence of marginal bone loss and failure rate of MIS internal hex implants bearing different types of prosthesis.

- A Long-term retrospective analysis.

Moshe Tandlich[1], Pini Reizman[2], Lior Shapira[1]

Aim of study

The aim of this study was to retrospectively evaluate the success rate of internal hex oral implants (MIS implants), installed in a private clinic milieu, after long-term function, and to construct a multivariate correlation model between crestal bone loss and formerly documented proposed predictors (i.e. time, smoking habits, type of abutments, type of prosthesis etc).

Materials and methods

Patients treated in a private clinic (PR) with oral implants were recalled for a routine dental exam. The exam included a full record of their health condition, habits, state of the prosthetic appliance and their treatment time-line. Only patients who had concluded more than 30 months of followup time were included in this study. Collected data included records of the patients' smoking habits, their type of prosthesis (RPD or FPD), the prosthesis span and configuration (e.g. cantilevered pontics, implant to tooth splinting, etc.), type of abutments used (milled or cast abutments), time of implant installation (immediate, early or late) , length of service etc. A panoramic radiogram was taken to evaluate the state of the prosthesis, and was used to measure the amount of crestal bone loss around each implant. The actual bone loss was calculated using the formula (see Fig. 1)

Statistical analysis

Descriptive statistics were used to report the success rates of the implants.
Two different approaches were engaged to analyze the correlation between crestal bone loss and the suspected prognostic variables:
In one, each patient's mean crestal bone loss was used as a unit of analysis, and in the other the single implant bone loss served for the statistics. Linear regression and ANOVA were used to describe correlation between suspected variables and crestal bone loss.

Results

One hundred and ninety implants installed in 46 patients were evaluated, having between thirty months and 9 years with an average of 5.3 years of followup time. Five (2.6%) implants failed and were removed prior to the prosthetic phase (early loss), and another 4 implants failed through time of service (2.1% of all evaluated implants), 3 of them in a patient suffering from osteoporosis.

181 implants were found to be present at the followup examination, however three of them were never rehabilitated, and thus were termed 'sleeping'.
The overall success rate was 95.3%. None of the suspected variables was found to be correlated with a failure event.

The patients' average calculated bone loss was 2.99 mm leaving an average of 0.83 threads exposed. Smoking was the only predictor that was correlated with higher bone loss when data was evaluated using the patient as the unit of analysis.

Neither time, nor any of the other suspected variables were found to be correlated with higher bone loss. Removable prosthesis was marginally correlated with higher bone loss (p=0.053).
By evaluating the data with the single implant serving as the unit of analysis, time of function (p=0.03), smoking and presence of removable prosthesis (p<0.05) were found to be correlated with higher bone loss.

Although the correlation between bone loss and time was found to be statistically significant, its strength was low (r^2=2.5%), presenting a 0.012 mm calculated rate of monthly bone loss (i.e. 0.144 mm/year).

Conclusions

The results of the present study confirm that MIS internal hex implants exhibited an overall success rate of 95% after a long-term follow-up period. By evaluating the data with the patient serving as the unit of analysis only smoking habits were found to be correlated with higher crestal bone loss. None of the other suspected variables was found to be a statistically significant predictors of bone loss.

Acknowledgement

This study was supported by a scientific grant from MIS ltd. ISRAEL.

[1]Dept. of Periodontology, Hadassah Medical Centers, Jerusalem, Israel. [2]Private Practice, Hurdegaryp, The Netherlands.

Fig. 1
Calculation of The actual bone loss

$$\text{Actual bone loss} = \frac{\text{Radiographic bone loss} \times \text{Known implant lenght}}{\text{Radiographic implant length}}$$

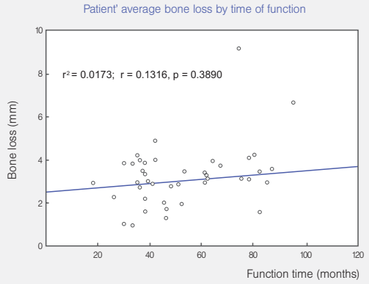
Table 1
number of failed implants and their relative rates

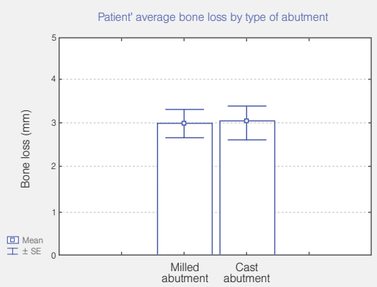
	Number	Rate (%)	
Early loss	5	2.6	4.7% failure rate
Late loss	4	2.1	
'Sleeping' implants	3	1.6	95.3% success rate
Functioning implants	178	93.7	
Total	190	100	

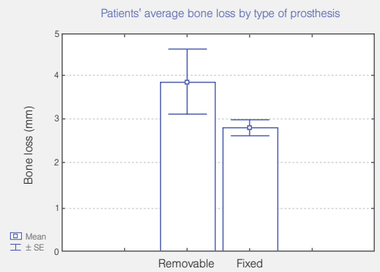
Graph 1

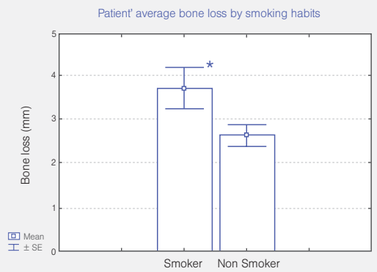
Correlation between patient mean bone loss and some of the suspected variables. The patient mean bone loss serves as the unit of analysis. Crestal bone loss is found to be significantly correlated only with smoking habits. No statistically significant correlation is found between crestal bone loss and time of function.

* p<0.05.









Graph 2

Correlation between each implant bone loss and some of the suspected variables. The single implant calculated bone loss serves as the unit of analysis. The implant bone loss is correlated with time of function, smoking habits and type of prosthesis.

* p<0.05.