Bone loss around tapered implants with split coronal microthreads

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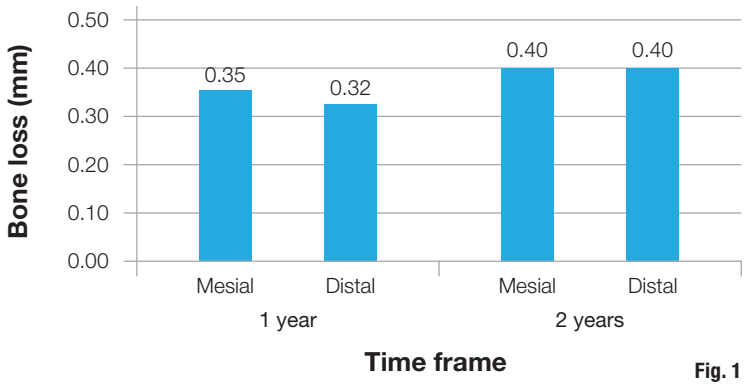

Fig. 1

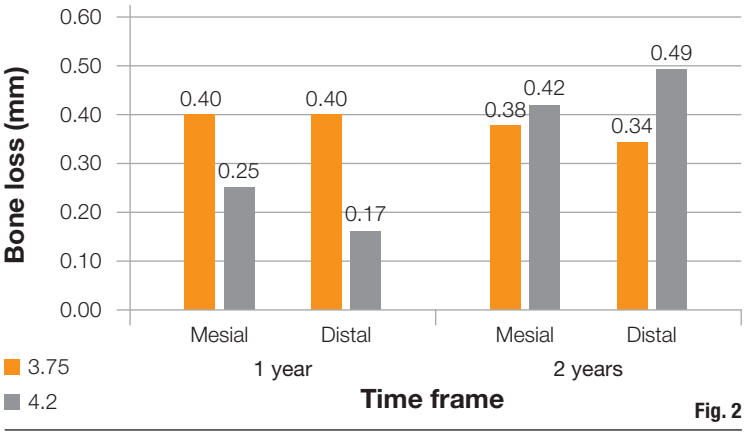

Fig. 2

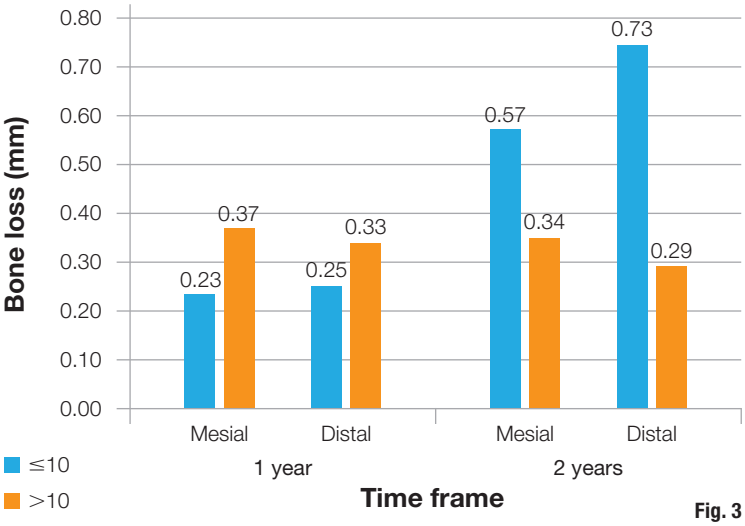

Fig. 3

Introduction

Dental implants are frequently used for the treatment of edentulism. However, marginal bone loss around implants during the first years after implantation varies between implant systems demanding an evaluation of implant performance over time.

The purpose of the here described retrospective field study was thus to examine the marginal bone loss rate around ICE implants (Alpha-Bio Tec, Israel) at one and two years of follow-up. First marketed in 2013, they are universal implants suitable for multi-clinical indications. The implants have an apical tapered design and a back tapered coronal part with split microthreads.

Materials and methods

The study was performed in three private clinics in Israel on 96 patients all older than 18 years of age and in good general and dental health who had been treated with the given type of implant within the last two years. In total 238 ICE implants were placed. Radiographic bone loss data was recorded and analysed immediately after insertion of the implant—serving as the baseline of the study—and retested after 12 and 24 months.

In the study, digital periapical radiographs and dental medical information were collected and summarised. Digital images were analysed by an independent examiner for marginal proximal bone loss using the ImageJ 1.33 open-source software (National Institute of Health, USA). The implant length served as a reference for bone loss calculations and the bone level was defined as the distance from the most coronal part of the implant shoulder to the first radiological bone-to-implant contact. Mesial and distal bone level changes in this region were recorded, and the mean of these two values was then used for further evaluation.

Fig. 1: Total bone loss over two years: Mesial teeth #1 and #2, distal teeth #3 to #6. **Fig. 2:** Effect of implant diameter on bone loss over two years. **Fig. 3:** Effect of implant length on bone loss.

Results

231 out of 238 implants survived the 24-month evaluation period. Seven implants were lost due to peri-implantitis, representing 2.9 per cent. The average change in the marginal bone level registered after 12 months was 0.35 mm mesial and 0.32 mm distal, and 0.4 mm both mesial and distal after 24 months (Fig. 1). The average increase in bone loss measured between the first and the second year of the study was calculated and found to be 0.065 mm.

The effect of the implant dimensions on bone loss was also analysed. After 12 months, wider implants with a diameter of 4.2 mm showed less bone loss than 3.75-mm implants. Whereas after 24 months, the 4.2-mm implants showed a higher bone loss rate than the once with a diameter of 3.75 mm (Fig. 2). In a further step the effect of implant length was also analysed. It was found that short implants of 10 mm and less showed higher bone loss after 24 months (Fig. 3).

Conclusion

Within the limitations of this study, the ICE implant system showed a high survival rate of 97 per cent 24 months after implantation with minimal bone loss levels of 0.4 mm. According to the literature these results exceed those recorded by other implant manufacturers.[1,2]

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Literature

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