Background and Aims

Extraction of remaining teeth and simultaneous implant therapy may be the most rational solution for many patients with a remaining diseased dentition. The benefits are evident as the patient will receive a fixed bridge through one surgical procedure without the need for removable dentures and healing periods. Although immediate/elective loading is a straightforward approach in the mandible according to the literature, the same treatment in the maxilla is less well documented, particularly when implants are placed in fresh extraction sites (1). Due to the more frequent presence of low bone density compared to the mandible and limited bone volumes under the nose and maxillary sinuses, increased implant failure rates may be expected. However, implant stability measurements and avoiding loading of implants with low primary stability may reduce the risk for failures (2).

The aims of the investigation were to study (i) implant stability, (ii) implant survival and (ii) marginal bone levels in consecutive patients treated with total extraction, simultaneous implant placement and delayed loading with a provisional fixed bridge in the maxilla during 1 to 6 years.

Methods and Materials

A total of 43 patients (25 female, 18 male) had their remaining teeth extracted (2 to 11) and a total of 258 implants (5 to 7 implants/patient) (NeoPro, Proactive Straight and Tapered, Neooss Ltd, Harrogate, UK) placed during the same surgical procedure. All implants were analysed with Resonance Frequency Analysis (RFA) in Implant Stability Quotient (ISQ) units (Osstell AB, Göteborg, Sweden). Sterile 16 mm long impression copings were attached to the implants where after the soft tissues were adjusted and sutured. An impression was taken using an individual tray. Healing abutments were connected and a bite registration was taken using an individual tray, which was supported by the palate and the opposing dentition/denture as determined in presurgical casts mounted in an articulator. After 1 to 3 days, a screwretained acrylic provisional bridge made on temporary titanium abutments and a metal framework was connected. Three to nine months after surgery, the implants were re-evaluated with RFA and a permanent bridge was manufactured and delivered. The patients were clinically and radiographically evaluated at annual checkups. The present study reports the implant and bridge survival rate after 1 to 6 years and marginal bone levels after at least 5 years of function (116 implants).

Results

Implant stability

The mean stability of all implants was 73.8 ±4.7 ISQ. Five implants were not early loaded due to low primary stability (mean 63.5 ±7.6 ISQ) but were included in the permanent bridge.

Implant failures

A total of 9 implants in 5 patients were lost giving a survival rate of 96.5% after 1 to 6 years of loading. All failures were discovered when the provisional bridge was planned to be replaced with a permanent one. The failed implants had a similar primary stability (mean 73.2 ±7.6 ISQ) as the successful ones. All but one patient could be restored as planned (97.7%). One patient who lost 5 of 6 implants had new implants inserted and eventually got a permanent fixed bridge.

Radiography

The marginal bone level was situated on average 1.2 ±0.8 mm from the implant shoulder after 5 years (range 0 to 4.4 mm). 68.7% of all implants had the bone level at the 1.9 mm high implant collar, indicating no exposed threads.

Conclusions

- Extraction of remaining teeth in the maxilla and simultaneous implant placement for early loading of a provisional fixed bridge results in good outcomes after 1 to 6 years of loading.
- Failures do occur but single implant failure does not prevent completion of the final prosthetic treatment when placing 5 to 7 implants.
- The marginal bone levels after 5 years are similar as to what has been reported for the same implant type when used in conventional two-stage procedures (3).

References