TSV® Clinical Compendium

Success Stories in Stability and Survival Rates
# Table of Contents

**Primary Stability**
- 4
  - Soft-Bone Protocol
  - Advancements in Soft-Bone Implant Stability | Rosenlicht

**Immediate Loading**
- 5
  - Immediate Placement and Provisionalization of Implant-Supported, Single-Tooth Restorations:
    - A Retrospective Study | El-Chaar and Bettach
  - Immediate Loading of Single-Tooth Restorations: One-Year Prospective Results | Siddiqui et al.
  - Immediate and Early Loading of Hydrothermally Treated, Hydroxyapatite-Coated Dental Implants:
    - 2-Year Results from a Prospective Clinical Study | Simmons et al.

**Implant Insertion Torque**
- 8
  - Histologic and Biomechanical Evaluation of the Effects of Implant Insertion Torque on
    - Peri-Implant Bone Healing | Consolo et al.

**Secondary Stability**
- 9
  - Bone-to-Implant Contact
    - Bone-to-Implant Apposition with Machined and MTX® Microtextured Implant Surfaces
      - in Human Sinus Grafts | Trisi et al.

**Mandible and Maxilla Outcomes**
- 10
  - Prospective Clinical Evaluation of 835 Multithreaded Tapered Screw-Vent® Implants:
    - Results After Two Years of Functional Loading | Khayat et al.

**Abutment Interface Stability**
- 11
  - Friction-Fit Connection
    - The Evolution and Evaluation of an Interference-Fit Implant Interface | Binon

**Long-term Outcomes**
- 12
  - Immediate Loading
    - A 10-Year Retrospective Clinical Evaluation of Immediately Loaded Tapered Maxillary Implants | Harel et al.

**Bone Level Maintenance**
- 13
  - Long-Term Clinical Evaluation of Tapered Multi-threaded Implants: Results and Influences
    - of Potential Risk Factors | Ormianer and Palti

**Survival Rates**
- 14
  - The Use of Tapered Implants in the Maxillae of Periodontally Susceptible Patients:
    - 10-Year Outcomes | Ormianer and Palti

**Case Study**
- 15

**References**
- 16
Soft-Bone Protocol
Advancements in Soft-Bone Implant Stability


Objective
• To present an overview of a self-tapping, tapered implant that features a patented surgical procedure designed to enhance initial stability.

Methods
• In 1991, the US Department of Veterans Affairs (VA) launched a prospective, multi-centre study to determine the influence of implant design and bone location on long-term implant success.
• The VA study comprised more than 800 patients and over 80 investigators at 30 VA medical centers and two university dental schools.
• A total of 2795 implants were placed.

Results
• Tapered Screw-Vent Implants feature three independent, external lead threads that spiral up the implant body at a steeper angle than conventional implant threads.
• Once fully assembled, the restorative component forms a “virtual cold weld” with the implant.
• In corporate testing, the smallest diameter of Tapered Screw-Vent Implants (3.7 mmD) withstood 378 lb of compressive force at 30 degrees and 24.6 in-lb of torque.

Conclusions
• Tapered Screw-Vent Implant features multiple lead threads and a surgical protocol to compress soft bone during seating for enhanced mechanical fixation.
• For higher density bone, an additional finishing drill is designed to enhance apical bone engagement for additional stability.

As the Tapered Screw-Vent Implant gradually seats into the receptor site, the widening diameter of the implant body compresses the soft bone to increase mechanical retention for initial stability.
Immediate Loading
Immediate Placement and Provisionalization of Implant-Supported, Single-Tooth Restorations: A Retrospective Study


Objective
• To report on the outcome of a retrospective, private practice study undertaken to determine the clinical efficacy of immediate implant placement and non-occluding provisionalization of single-tooth implants placed into fresh extraction sockets, followed by definitive, full-occlusal loading within 2 weeks after placement.

Methods
• 206 implants were placed into fresh extraction sites using a flapless technique, followed by immediate provisionalization with non-occluding single-tooth restorations and definitive restoration within 2 weeks.

Results
• Cumulative success and survival rates were 98.77% (mean follow-up of 23.1 months).

Conclusions
• Within the limitations of this study, immediate implant placement and restoration, followed by definitive loading within 2 weeks, achieved outcomes comparable to those historically reported for delayed implants.

Tapered Screw-Vent Implant may be immediately loaded when good primary implant stability and an appropriate occlusal load are achieved.3 (Hex-Lock® Contour Abutment shown)
Immediate Loading

Immediate Loading of Single-Tooth Restorations: One-Year Prospective Results

Objective
• This study prospectively evaluated the clinical efficacy of placing implant-supported, single-tooth restorations into immediate, full-occlusal loading.

Methods
• Sixty consecutive patients (intent-to-treat group) with 1 missing tooth between 2 intact teeth were treated with a total of 69 implants.
• At placement, final impressions were made and implants were provisionalized with non-occluding prostheses.
• Definitive prostheses were delivered 2 weeks later.

Results
• At 12 months, cumulative implant success rates were 98.55% (n=68/69) for the intent-to-treat group and 98.04% (n=50/51) for the treated-per-protocol group.
• There were no significant adverse events or statistically significant differences between the experimental and historical control groups.

Conclusions
• Immediate full-occlusal loading of single-tooth restorations was safely performed in selected subjects when good primary implant stability and an appropriate occlusal load were achieved.
Immediate Loading
Immediate and Early Loading of Hydrothermally Treated, Hydroxyapatite-Coated Dental Implants: 2-Year Results from a Prospective Clinical Study


Objective
• To evaluate the outcome of MP-1 HA-coated Tapered Screw-Vent Implants loaded earlier than 3 – 6 months.

Methods
• Group A implants (n = 23) were loaded on the day of surgery and Group B implants (n = 19) were loaded 3 weeks after surgery.

Results
• Group A survival rate was 100% (n = 23/23. Group B had one failure, with a survival rate of 94.7% (n = 18/19).
• After two years in function, average bone loss in Group A of 0.81 + 0.59 mm and in Group B of 0.70 + 0.41 mm were reported.

Conclusions
• In this study, MP-1 HA-coated Tapered Screw-Vent Implants were clinically predictable when restored in occlusion immediately or within three weeks of implant placement.
Implant Insertion Torque
Histologic and Biomechanical Evaluation of the Effects of Implant Insertion Torque on Peri-Implant Bone Healing

Objective
• To evaluate histologically and biomechanically the peri-implant bone healing around implants placed with high torque after a follow-up of 8 and 12 weeks.

Methods
• A total of 12 implants were placed in the lower edge of the mandible of 2 sheep. In each sheep, 3 implants were placed with a low torque (25 Ncm, LT group) as a control, and 3 implants were placed with a high insertion torque (maximum torque, HT group).
• The sheep were sacrificed after 8 and 12 weeks of healing, and the implants were examined for removal torque, resonance frequency analysis, and histologic analysis.

Results
• The mean insertion torque in the LT group was 24 Ncm, whereas it was 105.6 Ncm in HT.
• Mean removal torque values for LT implants were 159.5 and 131.5 Ncm after 8 and 12 weeks, respectively, whereas those for the HT were 140 and 120 Ncm at 8 and 12 weeks, respectively.

Conclusions
• High implant insertion torque does not induce adverse reaction in cortical bone and does not lead to implant failure in the sheep mandible.

Preclinical results may not be indicative of clinical performance.
Bone-to-Implant Contact

Bone-to-Implant Apposition with Machined and MTX Microtextured Implant Surfaces in Human Sinus Grafts


Objective

• The goal of this study was to histologically document the effect of two different implant surfaces on the percentage of bone-to-implant apposition achieved with implants placed in human sinus grafts.

Methods

• Nine healthy volunteers were scheduled to undergo posterior maxillary sinus floor augmentation in preparation for delayed implant placement.
• Each microimplant was prepared longitudinally with two different surface topographies: machined on one side and MTX microtextured on the other side.

Results

• Histologic analysis revealed that the mean bone-to-implant apposition was significantly greater with MTX (72.31% +/- 17.76%) compared to machined surfaces (38.01% +/- 19.32%).

Conclusions

• The microtextured MTX surface was able to achieve a significantly higher level of osseointegration than the machined titanium surface.
• The healing time between graft and implant placement and implant location did not statistically impact the percentage of bone-to-implant apposition.
Mandible and Maxilla Outcomes

Prospective Clinical Evaluation of 835 Multithreaded Tapered Screw-Vent Implants: Results After Two Years of Functional Loading


Objective

• To prospectively evaluate the survival rates and success rates of multithreaded tapered implants during 2 years of functional loading in humans.

Methods

• A total of 835 implants (Tapered Screw-Vent Implants, Zimmer Biomet Dental) in diameters of 3.7 mm (9%), 4.7 mm (76%), and 6.0 mm (15%) were placed in 328 patients using a single-stage loading protocol.
• The implants were restored with a variety of prostheses and monitored over 2 years of functional loading.

Results

• Cumulative implant survival was 99.4% (n = 835); Differences between mandibular (99.0%, n = 408) and maxillary (99.8%, n = 427) implants were not statistically significant (P > .20). Five implants were lost during the healing period and were removed before loading.
• Cumulative implant success was 98.6% (n = 835); Differences between maxillary (98.6%) and mandibular (98.8%) implants were not statistically significant (P > .20).
• Success rates by implant diameter were 98.6% (3.7 mm), 98.4% (4.7 mm) and 100% (6 mm).

Conclusions

• After 2 years of functional loading, survival and success rates for multithreaded tapered implants placed in a nonsubmerged protocol equaled or surpassed those of single-thread, straight-walled implant historical controls.
• In this study, the survival and success rates of Tapered Screw-Vent Implants were comparable in the maxilla and mandible when used in a single-stage loading protocol.
Friction-Fit Connection
The Evolution and Evaluation of an Interference-Fit Implant Interface

Objective
• The purpose of this study was to evaluate abutment seating, implant / abutment interface discrepancies and the rotational misfit of friction-fit hexagonal systems.

Methods
• The implants were evaluated for rotational movement and intimacy of hexagonal contact, the adequacy of the implant-abutment interface seal, and machining consistency of the abutment and implant hexagonal connections.
• Available components are contrasted with components that were available initially in the evolution of this friction-fit interface.

Results
• Rotational freedom was 0 degrees for Screw-Vent® Implants when fully tightened to 30 Ncm.
• Rotational freedom (misfit) was 0.4 degrees for Screw-Vent Implants with minimal finger pressure tightening.

Conclusions
• The 45-degree beveled implant / abutment seating surfaces of Screw-Vent Implants contact intimately without any discernible interface gap.
Immediate Loading
A 10-Year Retrospective Clinical Evaluation of Immediately Loaded Tapered Maxillary Implants

Objective
• To compare the effects of immediate loading (IL) and delayed loading (DL) on peri-implant crestal bone loss around maxillary implants after long-term functioning over 10 years.

Methods
• A retrospective chart review was conducted to assess the outcomes of 110 tapered, multi threaded implants placed for the treatment of one or more missing and/or unsalvageable teeth in the maxilla of 23 patients.
• Implants were assigned to either the DL or IL database according to loading time.

Results
• After a mean follow-up of 111 months in the DL group and 119 months in the IL group, cumulative survival was 99.09% (DL = 98.11%, IL = 100%).
• No observable bone loss was evident in 83.49% of the surviving implants.
• Cumulative success rates were 100% for the IL group and 98.11% for the DL group.

Conclusions
• Immediately loaded maxillary implants showed long-term results comparable to delayed loaded maxillary implants.

Comparable crestal bone loss seen in both immediate and delayed loading of implants.
Bone Level Maintenance

Long-Term Clinical Evaluation of Tapered Multi-threaded Implants: Results and Influences of Potential Risk Factors


Objective
• To evaluate the long-term performance of Tapered Screw-Vent Implants placed in patients with a variety of potentially compromising clinical variables.

Methods
• Sixty patients treated with 218 implants participated in the study, where each case included one or more potential risk factors associated with increased rates of implant failure, peri-implant bone loss or clinical complications in the dental literature: short implants (23%), comorbid conditions (25%), maxillary implants (61%), immediate loading (88.5%), placement into extraction sockets (91%), and partial edentulism (97%). The implants were restored with a variety of prostheses.
• Mean clinical follow-up was 67.5 (range: 1-94) months for implants and 60 (range: 15-74) months for prostheses.

Results
• Cumulative survival rates were 98.2% for implants and 96.3% for prostheses after 5 years of clinical loading.
• No peri-implant marginal bone loss was observed for 98% of the implants.

Conclusions
• Tapered Screw-Vent Implants may be used with a high degree of predictability with little or no bone loss even in the presence of the potential risk factors detailed in this study.
• Concerns that tapered implant designs may be more prone to crestal bone loss than cylinder designs are unsupported by the results of this study.

Tapered Screw-Vent Implant family features options for both surface and coating.
Survival Rates
The Use of Tapered Implants in the Maxillae of Periodontally Susceptible Patients: 10-Year Outcomes

Objective
• To retrospectively assess the long-term efficacy of dental implant therapy in periodontally susceptible patients.

Methods
• A private practice chart review was conducted to identify partially dentate subjects treated with implant-supported restorations that had been monitored annually for at least 9.5 years.
• Subjects were assigned to either a periodontal group or a control group according to their health histories.

Results
• Cumulative 10-year survival rates were 99.3% (n=137/138) for periodontal implants and 100% (n=35/35) for control implants. One implant failed before loading in the periodontal group.
• Most surviving implants had no bone loss (n=109/172, 63.4%).

Conclusions
• Tapered Screw-Vent Implant survival was not affected by the presence of periodontal disease, but resulted in bone loss for the cohort presented in the current retrospective study.

In the case above, Tapered Screw-Vent Implants demonstrated aesthetic results and performance in the long-term.

Source: Clinical Images - Dr. Daulton Keith, D.D.S., F.I.C.D
Immediate Placement of TSVT Dental Implants

1. Preoperative clinical view of the incisor extraction sockets.

2. TSVT Implants (4.1 mm x 16 mm) with attached fixture mounts threaded into the prepared extraction sockets.

3. Radiographic view at the time of placement with surgical cover screws attached.

4. One-year post-placement radiograph with stable marginal bone levels around TSVT implants.

5. Clinical view of the aesthetic outcome one-year post restoration.

Source: Case Images - Dr. Suheil M. Boutros, Bloomfield Hills, Michigan
References


Contact us at 1-800-342-5454 or visit zimmerbiometdental.com