



# TSV<sup>®</sup> Clinical Compendium

Success Stories in Stability and Survival Rates



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# Primary Stability

## Soft-Bone Protocol

### Advancements in Soft-Bone Implant Stability<sup>1</sup>

Rosenlicht JL. West Indian Dent J 2002; 6: 2-7.

#### Objective

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

#### Methods

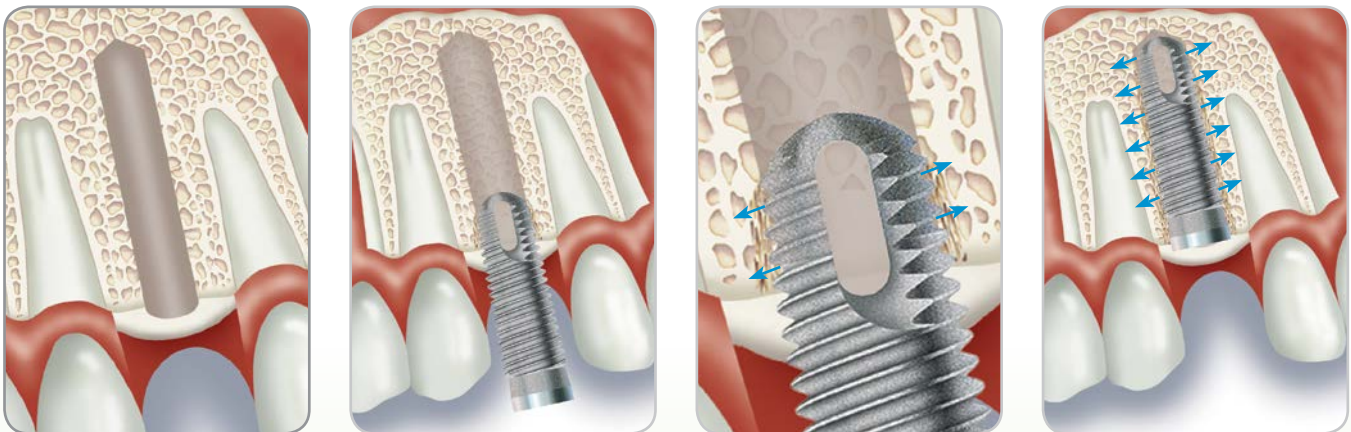
- In 1991, the US Department of Veterans Affairs (VA) launched a prospective, multi-centre study to determine the influence of implant design and bone location on long-term implant success.
- The VA study comprised more than 800 patients and over 80 investigators at 30 VA medical centers and two university 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.<sup>1</sup>

## Immediate Loading

### Immediate Placement and Provisionalization of Implant-Supported, Single-Tooth Restorations: A Retrospective Study<sup>2</sup>

El Char E, Bettach R. Int J Periodontics Restorative Dent 2011; 31: 409-419.

#### 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.<sup>3</sup> (Hex-Lock® Contour Abutment shown)



## Immediate Loading

### Immediate Loading of Single-Tooth Restorations: One-Year Prospective Results<sup>3</sup>

Siddiqui A, O'Neal R, Nummikoski P, Pituch D, Ochs M, Huber H, Chung W, Phillips K, Wang IC. J. Oral Implantol 2008; 34: 208-218.

#### 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.

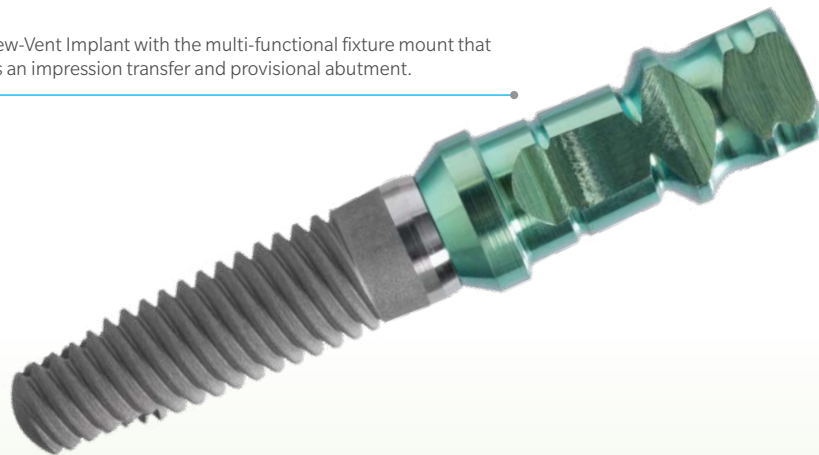
#### Results

- 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.

Tapered Screw-Vent Implant with the multi-functional fixture mount that may serve as an impression transfer and provisional abutment.



## Immediate Loading

### Immediate and Early Loading of Hydrothermally Treated, Hydroxyapatite-Coated Dental Implants: 2-Year Results from a Prospective Clinical Study<sup>4</sup>

Simmons DE, Palaiologou A, Teitelbaum AG, Billiot S, Popat LJ, Maney P. J. Oral Implantol 2016; 24(1): 17-25.

#### 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.

Tapered Screw-Vent Implants With MP-1  
HA Dual Transition Selective Surface.



## Implant Insertion Torque

### Histologic and Biomechanical Evaluation of the Effects of Implant Insertion Torque on Peri-Implant Bone Healing<sup>5</sup>

Consolo U, Travaglini D, Todisco M, Trisi P, Galli S. J Craniofac Surg. 2013; 24: 860-865.

#### 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.



Tapered Screw-Vent Implant at 12 weeks with bone in close contact with the threaded and neck portions.<sup>4</sup>



# Secondary Stability

## Bone-to-Implant Contact

### Bone-to-Implant Apposition with Machined and MTX Microtextured Implant Surfaces in Human Sinus Grafts<sup>6</sup>

Trisi P, Marcato C, Todisco M. Int J Periodontics Restorative Dent 2003; 23(5): 427-437.

#### 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

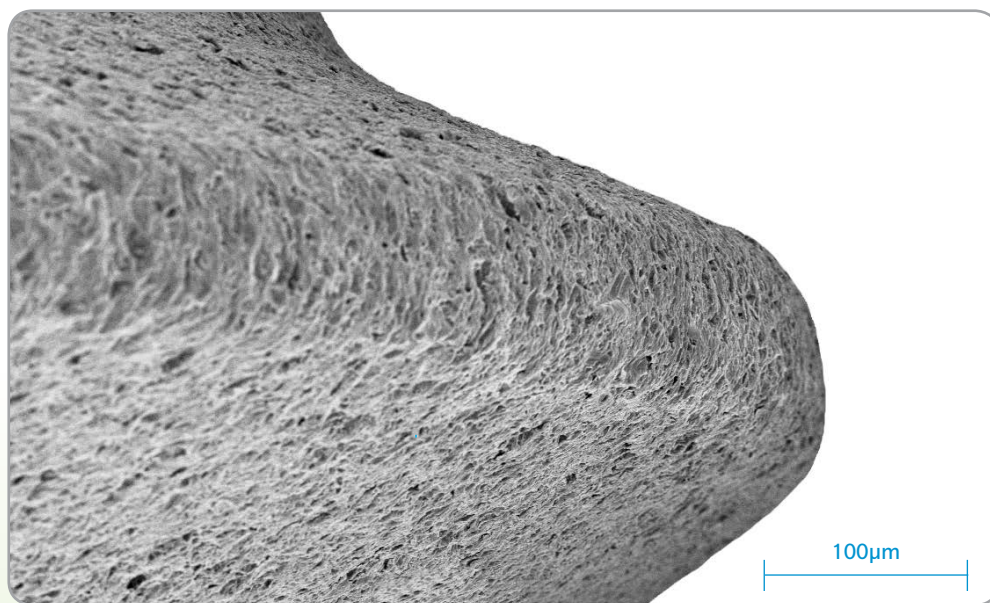
- Nine healthy volunteers were scheduled to undergo posterior maxillary sinus floor augmentation in preparation for delayed implant placement.
- Each microimplant was prepared longitudinally with two different surface topographies: machined on one side and MTX microtextured on the other side.

#### 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.



MTX Surface on a Tapered Screw-Vent Implant.

## Mandible and Maxilla Outcomes

### Prospective Clinical Evaluation of 835 Multithreaded Tapered Screw-Vent Implants: Results After Two Years of Functional Loading<sup>7</sup>

Khayat PG, Milliez SN. J. Oral Implantol 2007; 34: 225-31.

#### Objective

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

#### Methods

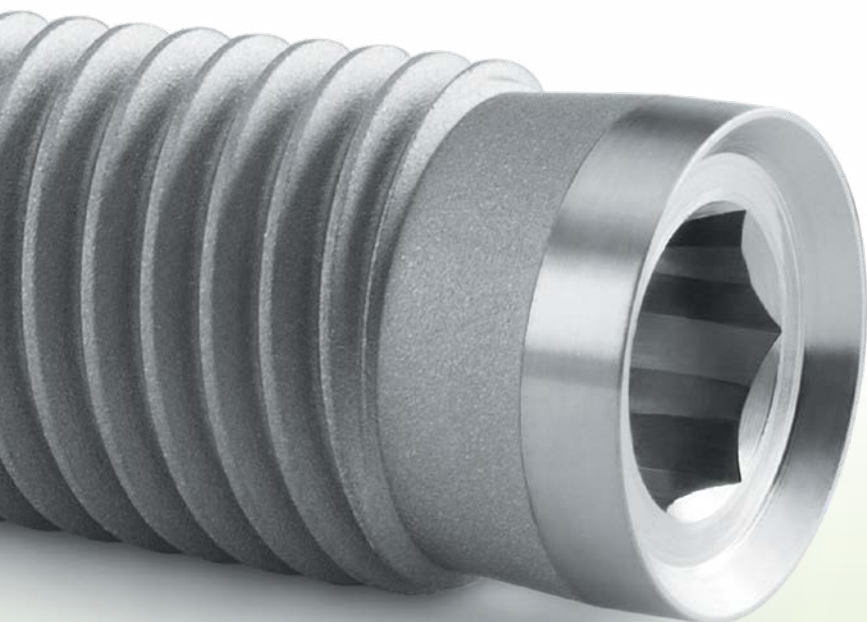
- A total of 835 implants (Tapered Screw-Vent Implants, Zimmer Biomet Dental) in diameters of 3.7 mm (9%), 4.7 mm (76%), and 6.0 mm (15%) were placed in 328 patients using a single-stage loading protocol.
- The implants were restored with a variety of prostheses and monitored over 2 years of functional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



1.5 mm deep internal hex shields the retention screw from excess loading.

# Abutment Interface Stability

## Friction-Fit Connection

### The Evolution and Evaluation of an Interference-Fit Implant Interface<sup>8</sup>

Binon PP. Postgraduate Dent 1996; 3: 3-13.

#### 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

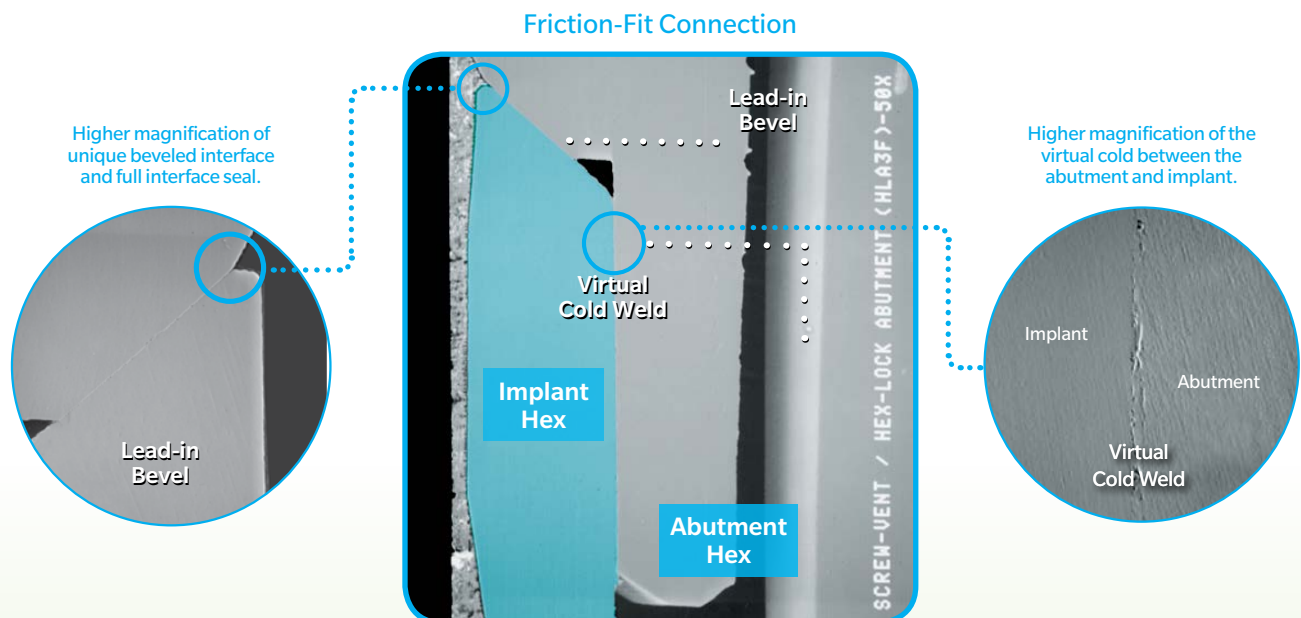
- The implants were evaluated for rotational movement and intimacy of hexagonal contact, the adequacy of the implant-abutment interface seal, and machining consistency of the abutment and implant hexagonal connections.
- Available components are contrasted with components that were available initially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

#### Results

- Rotational freedom was 0 degrees for Screw-Vent<sup>®</sup> 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.



Proprietary friction-fit connection with lead-in bevel and virtual cold weld that forms between internal hex implant and the abutment system.

# Long-term Outcomes

## Immediate Loading

### A 10-Year Retrospective Clinical Evaluation of Immediately Loaded Tapered Maxillary Implants<sup>9</sup>

Harel N, Piek D, Livne S, Palti A, Ormianer Z. Int J Prosthodont 2013; 26: 244-249.

#### 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

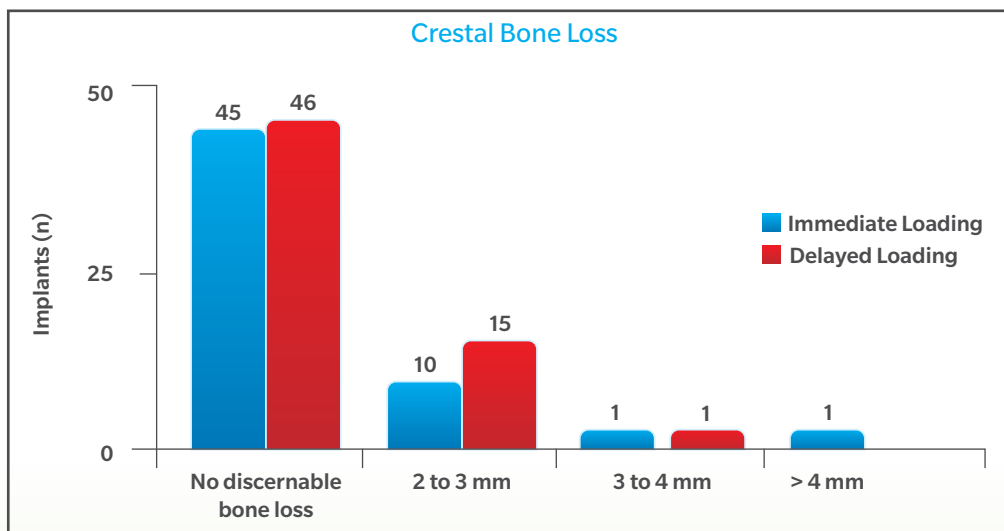
- A retrospective chart review was conducted to assess the outcomes of 110 tapered, multi threaded implants placed for the treatment of one or more missing and/or unsalvageable teeth in the maxilla of 23 patients.
- Implants were assigned to either the DL or IL database according to loading time.

#### 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.<sup>9</sup>

## Bone Level Maintenance

### Long-Term Clinical Evaluation of Tapered Multi-threaded Implants: Results and Influences of Potential Risk Factors<sup>10</sup>

Ormianer Z, Palti A. J. Oral Implantol 2006; 32: 300-307.

#### 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<sup>11</sup>

Ormianer Z, Palti A. Int J Oral Maxillofac Implants 2012; 27: 442-448.

#### 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.



**Final Restoration**



**X-Ray at Time of Final Restoration**



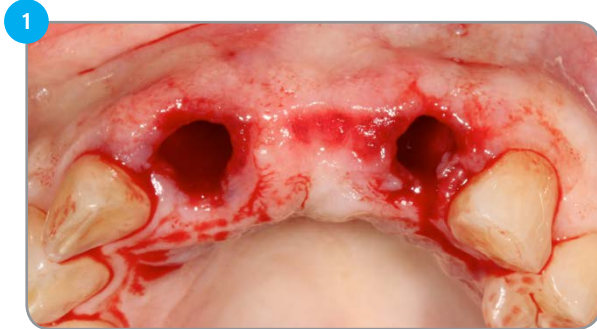
**10-Year Follow-Up Showed no Bone Loss**

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

# Case Study

## 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

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11. Ormianer Z, Palti A. The use of tapered implants in the maxillae of periodontally susceptible patients: 10- Year Outcomes. Int J Oral Maxillofac Implants 2012; 27: 442-448.



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