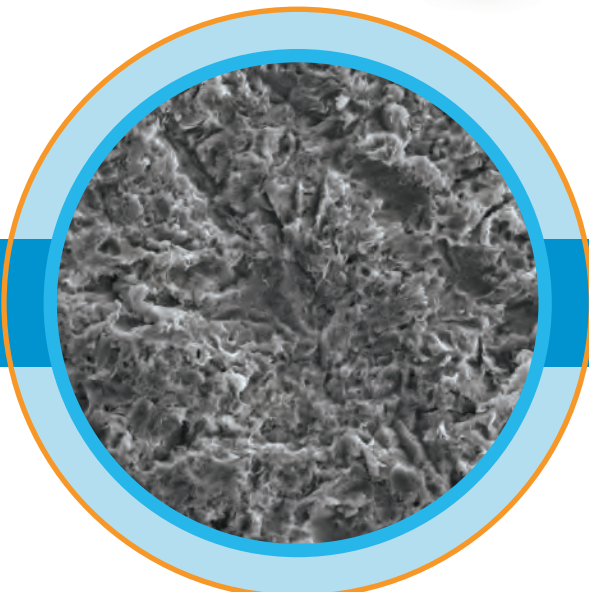
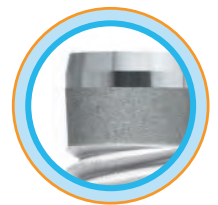
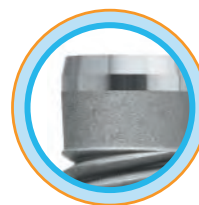
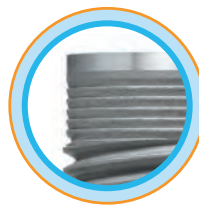
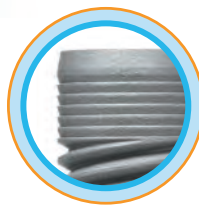


SCIENTIFIC COMPENDIUM



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Tapered
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Implant



Success Stories in Stability and Survival Rates

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1. ADVANCEMENTS IN SOFT BONE IMPLANT STABILITY¹

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

<p>Objective</p>	<ul style="list-style-type: none"> To present an overview of a self-tapping, tapered implant that features a patented surgical procedure designed to enhance initial stability.
<p>Methods</p>	<ul style="list-style-type: none"> 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.
<p>RESULTS</p>	<ul style="list-style-type: none"> <i>Tapered Screw-Vent</i> 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 <i>Tapered Screw-Vent</i> implants (3.7mmD) withstood 378 lb of compressive force at 30 degrees and 24.6 in-lb of torque.
<p>CONCLUSIONS</p>	<ul style="list-style-type: none"> <i>Tapered Screw-Vent</i> implant features multiple lead threads and a surgical bone 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.

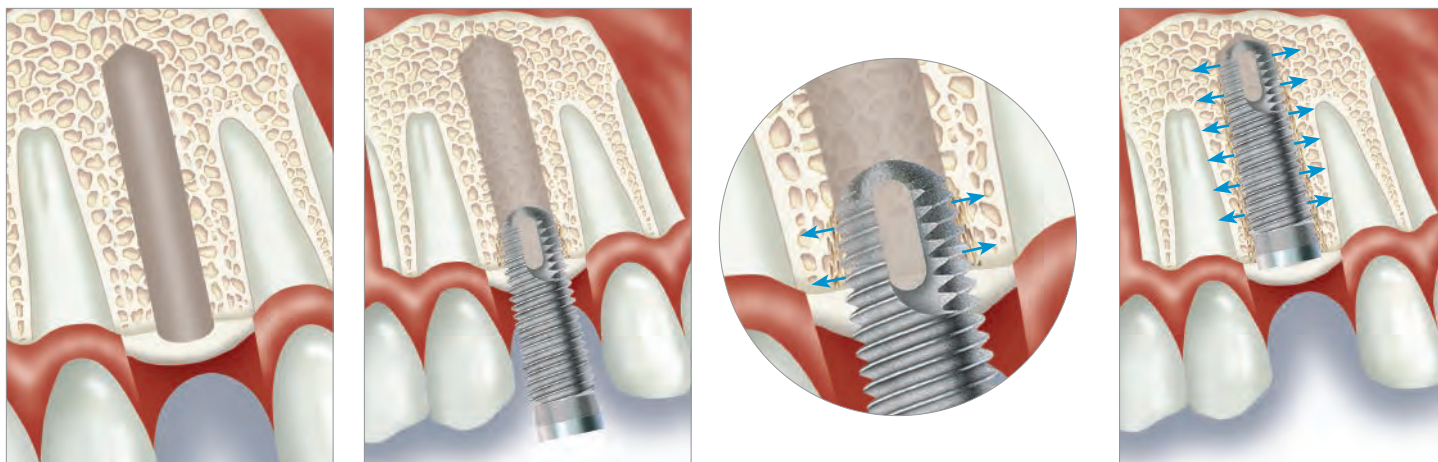


FIGURE 1. As the *Tapered Screw-Vent* Implant gradually seats into the receptor site, the widening diameter of the implant body compresses the soft bone to increase mechanical retention for initial stability.¹

2. IMMEDIATE PLACEMENT AND PROVISIONALIZATION OF IMPLANT-SUPPORTED, SINGLE-TOOTH RESTORATIONS: A RETROSPECTIVE STUDY²

El Chaar E, Bettach R. *Int J Periodontics Restorative Dent* 2011; 31(4).

Objective	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Cumulative success and survival rates were 98.77% (mean follow-up of 23.1 months).
CONCLUSION	<ul style="list-style-type: none"> 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.



FIGURE 2. Zimmer's *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)

3. IMMEDIATE LOADING OF SINGLE-TOOTH RESTORATIONS: ONE-YEAR PROSPECTIVE RESULTS³

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	<ul style="list-style-type: none"> This study prospectively evaluated the clinical efficacy of placing implant-supported, single-tooth restorations into immediate, full-occlusal loading.
Methods	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.
CONCLUSION	<ul style="list-style-type: none"> 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.



FIGURE 3. Zimmer’s *Tapered Screw-Vent* Implant with the multi-functional fixture mount that may serve as an impression transfer and provisional abutment.

4. HISTOLOGIC AND BIOMECHANICAL EVALUATION OF THE EFFECTS OF IMPLANT INSERTION TORQUE ON PERI-IMPLANT BONE HEALING⁴

Consolo U, Travaglini D, Todisco M, Trisi P, Galli S. *J Craniofac Surg.* 2013; 24: 860Y865.

Objective	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 (G25 N. cm, 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	<ul style="list-style-type: none"> The mean insertion torque in the LT group was 24 N. cm, whereas it was 105.6 N. cm in HT. Mean removal torque values for LT implants were 159.5 and 131.5 N. cm after 8 and 12 weeks, respectively, whereas those for the HT were 140 and 120 N. cm at 8 and 12 weeks, respectively.
CONCLUSION	<ul style="list-style-type: none"> High implant insertion torque does not induce adverse reaction in cortical bone and does not lead to implant failure in the sheep mandible.

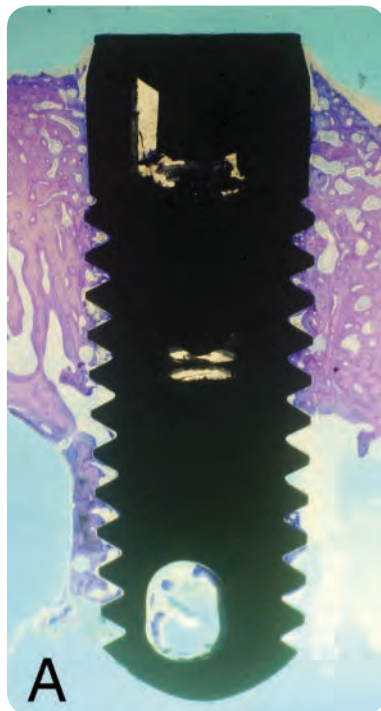


FIGURE 4. Control *Tapered Screw-Vent* Implant at 12 weeks with bone in close contact with the threaded and neck portions.⁴

5. HIGH VERSUS LOW IMPLANT INSERTION TORQUE: A HISTOLOGIC, HISTOMORPHOMETRIC, AND BIOMECHANICAL STUDY IN THE SHEEP MANDIBLE⁵

Trisi P, Todisco M, Consolo U, Travaglini D. *The Int J Oral Maxillofac Implants* 2011; 26: 837-849.

<p>Objective</p>	<ul style="list-style-type: none"> To analyze, in an animal model, the histologic and biomechanical phenomena at the bone-implant interface of implants inserted with high torque (HT) as compared to low torque (LT) during the first 6 weeks of healing.
<p>Methods</p>	<ul style="list-style-type: none"> Forty <i>Tapered Screw-Vent</i> implants were placed in five hybrid sheep. The implant sites were placed in the mandible using an extraoral approach. Four were placed with HT (test: mean 110Ncm) on one side and four were placed with LT (control: mean 10Ncm) on the contralateral side.
<p>RESULTS</p>	<ul style="list-style-type: none"> Implants from the HT group showed significantly higher bone apposition than implants from the LT group at all examined healing times. Implants from the LT group achieved a significant increase in stability after 4 weeks. Resonance frequency analysis was unable to detect these histologic and biomechanical modifications of the bone-implant complex.
<p>CONCLUSION</p>	<ul style="list-style-type: none"> High implant insertion torque (up to 150 Ncm) in dense cortical bone of the sheep mandible does not induce bone necrosis or implant failure but increases the primary stability of the <i>Tapered Screw-Vent</i> implants which is extremely important in immediate loading protocols.

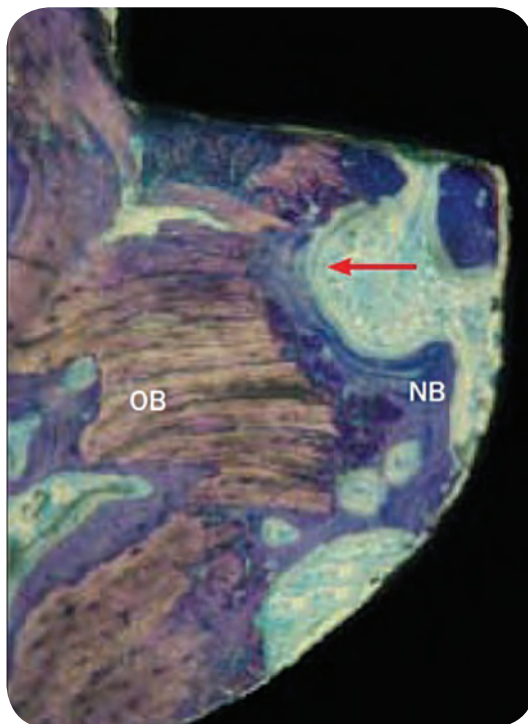


FIGURE 5. Test *Tapered Screw-Vent* implant after 4 weeks of healing showing evidence of new bone formation.⁵

6. BONE-TO-IMPLANT APPPOSITION WITH MACHINED AND MTX MICROTEXTURED IMPLANT SURFACES IN HUMAN SINUS GRAFTS⁶

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

Objective	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 one side and <i>MTX</i> microtextured on the other side.
RESULT	<ul style="list-style-type: none"> Histologic analysis revealed that the mean bone-to-implant apposition was significantly greater with <i>MTX</i> (72.31% +/- 17.76%) compared to machined surfaces (38.01% +/- 19.32%).
CONCLUSIONS	<ul style="list-style-type: none"> The microtextured <i>MTX</i> 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.

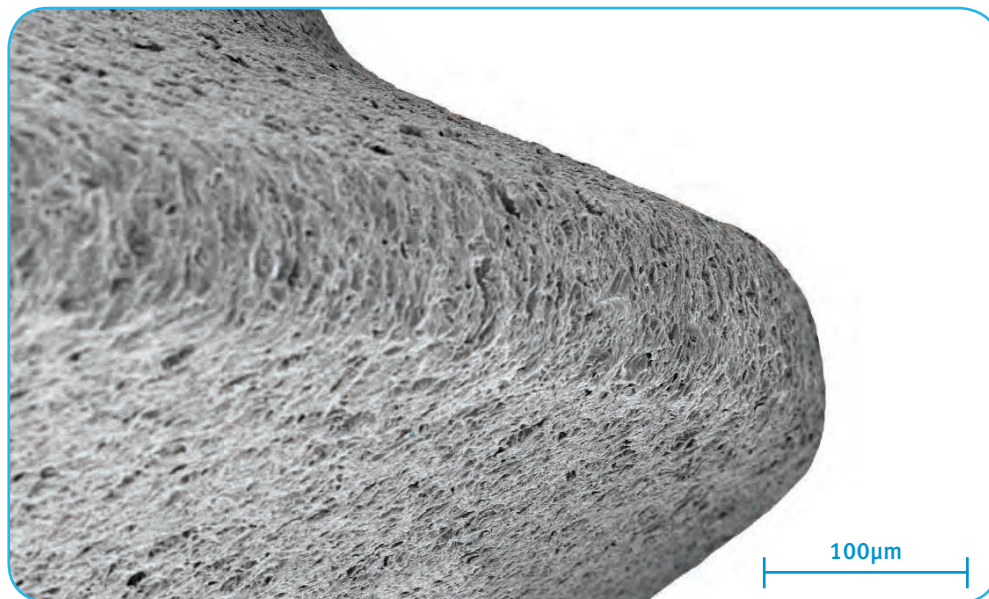


FIGURE 6. *MTX* Surface on a Zimmer Tapered Screw-Vent Implant.

7. THE EVOLUTION AND EVALUATION OF AN INTERFERENCE-FIT IMPLANT INTERFACE⁷

BINON PP. *POSTGRADUATE DENT* 1996; 3: 3-13.

Objective	<ul style="list-style-type: none"> The purpose of this study was to evaluate abutment seating, implant / abutment interface discrepancies, and the rotational misfit of friction-fit hexagonal systems.
Methods	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Rotational freedom was 0 degrees for Zimmer <i>Screw-Vent</i> implants when fully tightened to 30 NCM. Rotational freedom (misfit) was 0.4 degrees for Zimmer <i>Screw-Vent</i> implants with minimal finger pressure tightening.
CONCLUSION	<ul style="list-style-type: none"> The 45-degree beveled implant / abutment seating surfaces of Zimmer <i>Screw-Vent</i> implants contact intimately without any discernible interface gap.

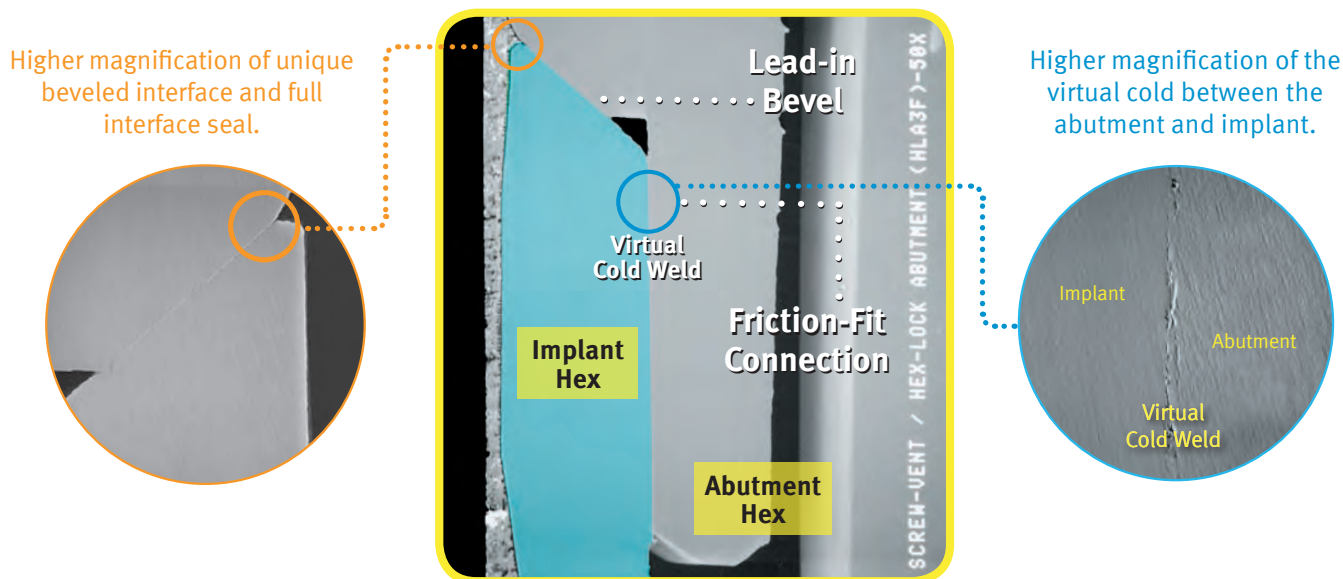


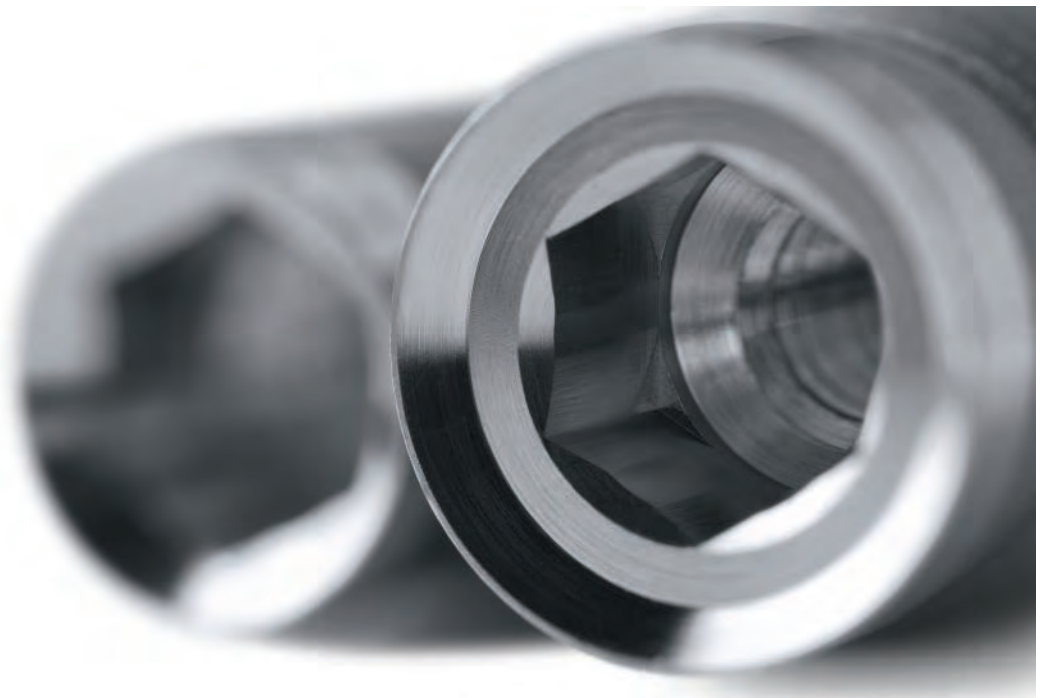
FIGURE 7. Proprietary friction-fit connection with lead-in bevel and virtual cold weld that forms between Zimmer’s internal hex implant and the abutment system.

8. PROSPECTIVE CLINICAL EVALUATION OF 835 MULTITHREADED TAPERED SCREW-VENT IMPLANTS: RESULTS AFTER TWO YEARS OF FUNCTIONAL LOADING⁸

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

<p>Objective</p>	<ul style="list-style-type: none"> To prospectively evaluate the survival rates and success rates of multithreaded tapered implants during 2 years of functional loading in humans.
<p>Methods</p>	<ul style="list-style-type: none"> A total of 835 implants (<i>Tapered Screw-Vent</i> Implants, Zimmer Dental) in diameters of 3.7mm (9%), 4.7mm (76%), and 6.0mm (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.
<p>RESULTS</p>	<ul style="list-style-type: none"> 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).
<p>CONCLUSIONS</p>	<ul style="list-style-type: none"> 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 <i>Tapered Screw-Vent</i> implants were comparable in the maxilla and mandible when used in a single-stage loading protocol.

FIGURE 8. Zimmer’s 1.5 mm deep internal hex shields the retention screw from excess loading.



9. A 10-YEAR RETROSPECTIVE CLINICAL EVALUATION OF IMMEDIATELY LOADED TAPERED MAXILLARY IMPLANTS⁹

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

Objective	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.
CONCLUSION	<ul style="list-style-type: none"> Immediately loaded maxillary implants showed long-term results comparable to delayed loaded maxillary implants.

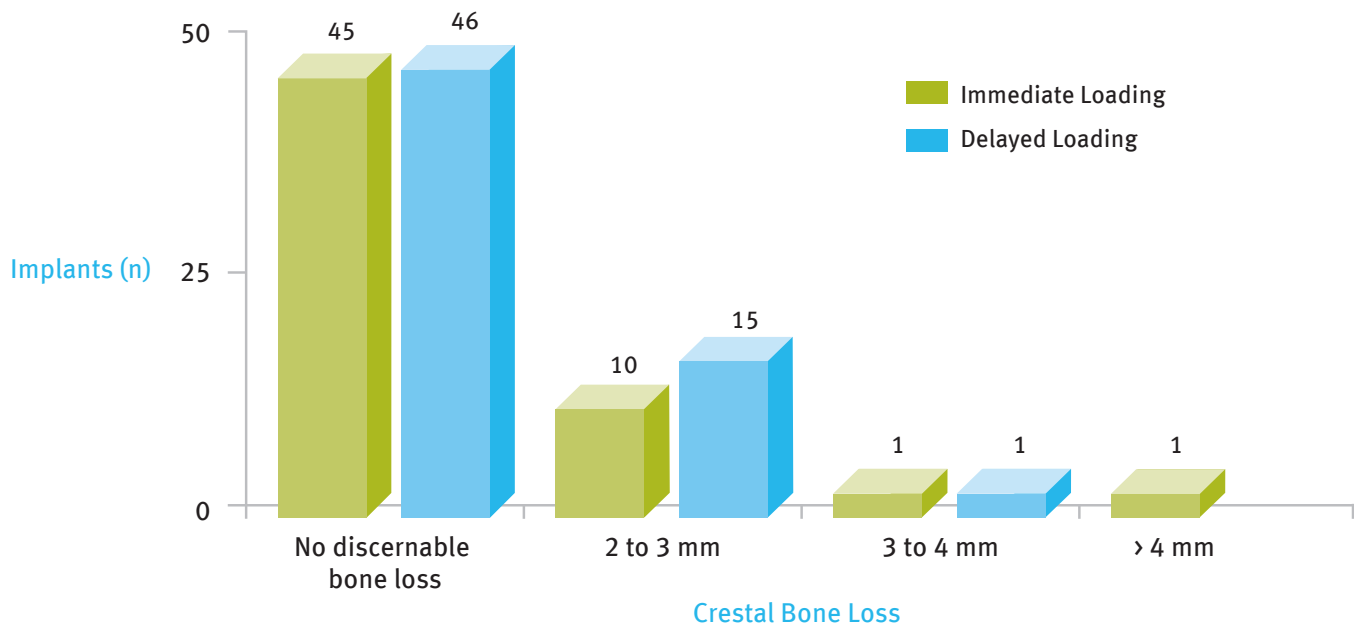


FIGURE 9. Comparable crestal bone loss seen in both immediate and delayed loading of implants.⁹

10. LONG-TERM CLINICAL EVALUATION OF TAPERED MULTI-THREADED IMPLANTS: RESULTS AND INFLUENCES OF POTENTIAL RISK FACTORS¹⁰

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

<p>Objective</p>	<ul style="list-style-type: none"> To evaluate the long-term performance of tapered screw implants placed in patients with a variety of potentially compromising clinical variables.
<p>Methods</p>	<ul style="list-style-type: none"> 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.
<p>RESULTS</p>	<ul style="list-style-type: none"> 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.
<p>CONCLUSIONS</p>	<ul style="list-style-type: none"> <i>Tapered Screw-Vent</i> 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.

TSV-MTX

TSV-HA



FIGURE 10. *Tapered Screw-Vent* Implant family features options for both surface and coating.

11. THE USE OF TAPERED IMPLANTS IN THE MAXILLAE OF PERIODONTALLY SUSCEPTIBLE PATIENTS: 10-YEAR OUTCOMES¹¹

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

Objective	<ul style="list-style-type: none"> To retrospectively assess the long-term efficacy of dental implant therapy in periodontally susceptible patients.
Methods	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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%).
CONCLUSION	<ul style="list-style-type: none"> <i>Tapered Screw-Vent</i> 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

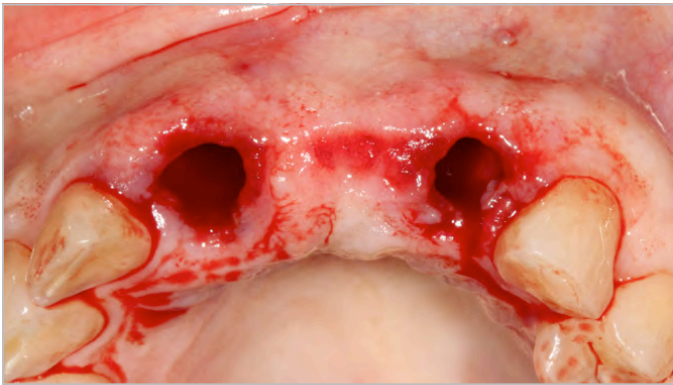


10-year follow-up showed no bone loss

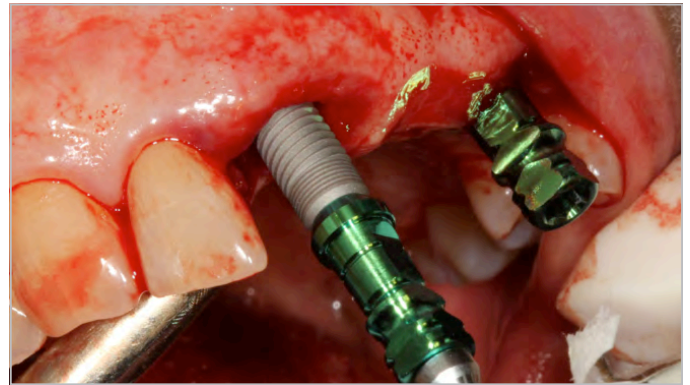
FIGURE 11. In the case above, *Tapered Screw-Vent* Implants demonstrated esthetic results and performance in the long-term.

Source : Clinical Images - Dr. Daulton Keith, D.D.S., F.I.C.D

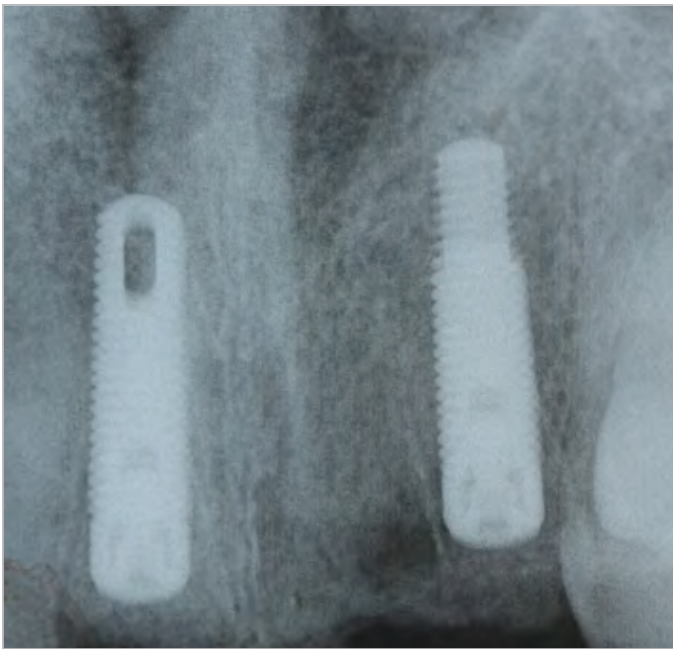
IMMEDIATE PLACEMENT OF ZIMMER TSVT DENTAL IMPLANTS



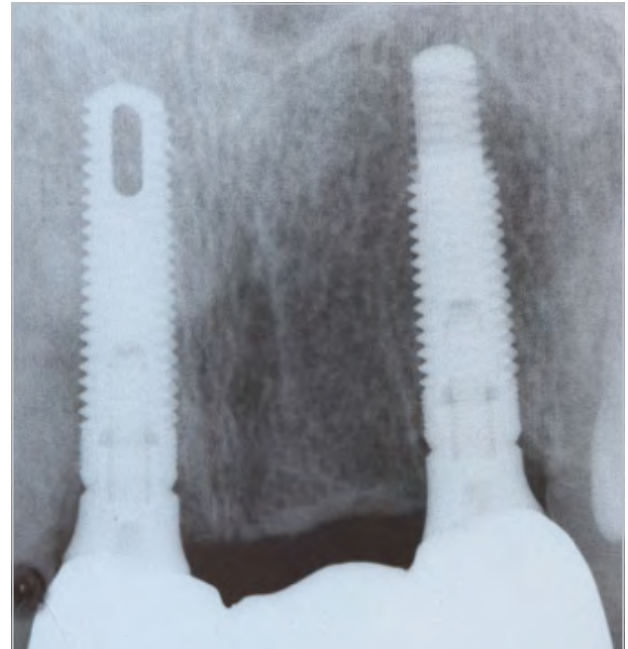
1 Preoperative clinical view of the incisor extraction sockets.



2 TSVT implants (4.1mm x 16mm) 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 esthetic outcome one-year post restoration.

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

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2. El Chaar E, Bettach R. Immediate placement and provisionalization of implant-supported, single-tooth restorations: a retrospective study. *Int J Periodontics Restorative Dent* 2011; 31(4).
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4. Consolo U, Travaglini D, Todisco M, Trisi P, Galli S. Histologic and biomechanical evaluation of the effects of implant insertion torque on peri-implant bone healing. *J Craniofac Surg.* 2013; 24: 860Y865.
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10. Ormianer Z, Palti A. Long-Term clinical evaluation of tapered multi-threaded implants: results and influences of potential risk factors. *J. Oral Implantol* 2006; 32: 300-307.
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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