

SwissPlus Implant System, Part 1: Surgical Aspects and Intersystem Comparisons

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In the decades since osseointegration^{1,2} and the techniques³ for achieving it were first discovered, clinical research has documented many new factors that can influence the long-term predictability of dental implants. Clinician experience,⁴ antibiotics,^{5,6} implant design,⁷ surface features,⁸⁻¹⁰ initial stability,^{11,12} tobacco usage,^{13,14} bone volume,^{15,16} and metabolic disease¹⁷ are some of the variables that can directly affect implant anchorage in bone. One of the most pervasive challenges to successful implant treatment is poor bone quality.^{18,19} Research has documented that relatively dense bone (types 1 and 2)²⁰ tends to form the lower jaw, whereas bone with relatively low density (types 3 and 4)²⁰ tends to comprise the upper jaw.²¹ Studies of machined, titanium implants over the last 20 years have shown a 10% higher failure rate in maxillary bone compared with the mandible.²²⁻²⁶ In one 5-year study, a failure rate of 35% was documented for uncoated titanium implants placed in type 4 bone.²⁶ This failure rate was 32% higher than the cumulative failure rate for all implants placed in types 1-3 bone reported in the same study.²⁶ Achieving successful implant anchorage in poor quality bone still remains a significant challenge to implant dentistry.

Traditionally, root-form dental implants were submerged beneath the soft tissue at the time of placement (stage one), then uncovered in a second surgical procedure 3 to 6 months

Implant survival in poor-quality bone continues to pose a significant clinical challenge to dentists. The SwissPlus System comprises one-piece, straight and tapered implant designs with self-tapping, apical threads, and a microtextured surface on the intraosseous portion of the implant bodies. Although both designs are indicated for all ranges of bone density, Tapered SwissPlus features double-lead threads and a soft-bone surgical protocol designed

later after bone healing (stage two). A number of recent studies have reported that attaching healing collars or abutments to two-stage implants at the time of insertion, followed by a one-stage healing period, produced clinical results comparable to implants placed via the two-stage surgical procedure.²⁷⁻³⁵ Other researchers have hypothesized that extending the implant's neck to reposition the implant-abutment junction above the crest of the ridge may decrease the incidence of marginal bone loss.³⁶ While this hypothesis has not been validated in any prospective clinical studies, implants with extended necks designed specifically for one-stage surgical procedures have also reportedly achieved clinical success rates comparable to traditional, two-stage implants.^{37,38}

This paper reports on a new, one-stage implant system designed to simplify traditional clinical procedures and mechanically address the different requirements of hard and soft bone. The system comprises straight and tapered implant options. Part 1 of this report will present an overview of the implant designs and surgical protocols of the system. In addition, results will

to enhance initial mechanical stability at the time of placement. This paper presents an overview of the SwissPlus System with emphasis on the surgical aspects. Presented test data also illustrate intersystem compatibility and differences between the straight SwissPlus and ITI syn-Octa implants. (Implant Dent 2002; 11:144-153)

Key Words: dental implants, single-stage, internal connection, self-tapping, microtextured surface

be presented on *in vitro* evaluations conducted to determine the system's compatibility with a competitive system.

MATERIALS AND METHODS

System Overview

SwissPlus System implants (Sulzer Dental Inc., Carlsbad, CA) are basically composed of a threaded, intraosseous body with a convex bottom, and a slightly fluted, transmucosal neck that extends above the soft tissue from the time of implant placement. The implants share a common, prosthetic platform 4.8 mm in diameter with an internal, 8-degree bevel-and-octagon connection.

The intraosseous portion of the implants features a medium-rough, microtextured surface (MTX; Sulzer Dental Inc.) created by blasting with soluble hydroxyapatite. In a histometric comparison of implants with microtextured and machined surfaces placed in human low-density jawbone, the researchers reported significantly more bone apposition to the microtextured surfaces.³⁹ The transmucosal implant neck has a relatively smooth,

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machined surface designed to minimize the adherence of bacteria and plaque^{40,41} and facilitate maintenance of soft tissue hygiene. Material strength and the stability of the implant-abutment connection are essential factors in preventing implant fractures and screw loosening during the long-term functioning of the implant. SwissPlus System implants are manufactured from Grade 4, commercially-pure titanium (CP Ti) (99%) that is work-hardened to provide a tensile strength of approximately 895 MPa. In comparison, Grade 1 CP Ti and Grade 3 CP Ti have minimum tensile strength requirements of 240 MPa and 450 MPa, respectively.⁴²

Straight implant design. The macro-configuration of the straight SwissPlus implant (Fig. 1 and Table 1) is similar to the ITI synOcta implant (Institut Straumann AG, Waldenburg, Switzerland) but features a number of design differences (Fig. 2 and Table 2). Conversely, the ITI synOcta implant has been licensed to use the patented internal octagon platform of the SwissPlus System. One key difference between the two implants is surface treatment. The ITI synOcta surface is produced by an aggressive blasting and etching procedure (SLA; Institut Straumann AG). Another difference is that the SwissPlus features a slightly tapered apical end, with cutting grooves, a vent, and threads extending to the apex designed to facilitate initial engagement of the receptor site and self-tapping insertion.

Tapered implant design. The Tapered SwissPlus implant features a tapered body design with double external thread pattern (Fig. 3 and Table 1). Single external thread patterns on conventional screw-type implants have a 0.6 mm pitch. In contrast, the double thread pattern features a 0.9 mm pitch, which adds 33% more threads to the implant body than the single thread pattern. Research on screw-type implants with such multiple thread patterns has documented faster insertion with less heat generation, greater initial stability, and increased insertion torque in comparison with single-thread, screw-type implants.⁴³⁻⁴⁵ The 3.7 mm-diameter tapered implant is manufactured with two different pros-

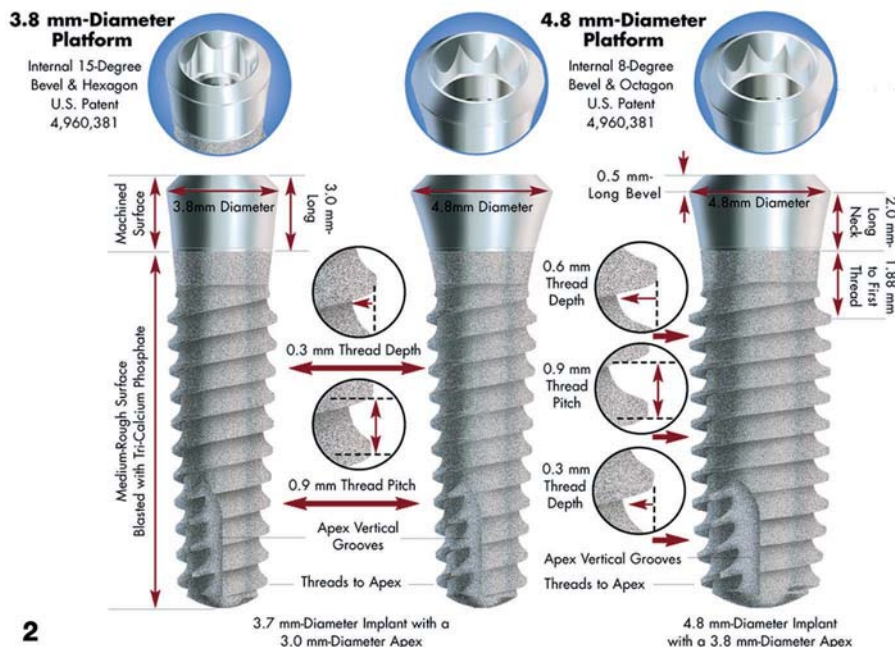
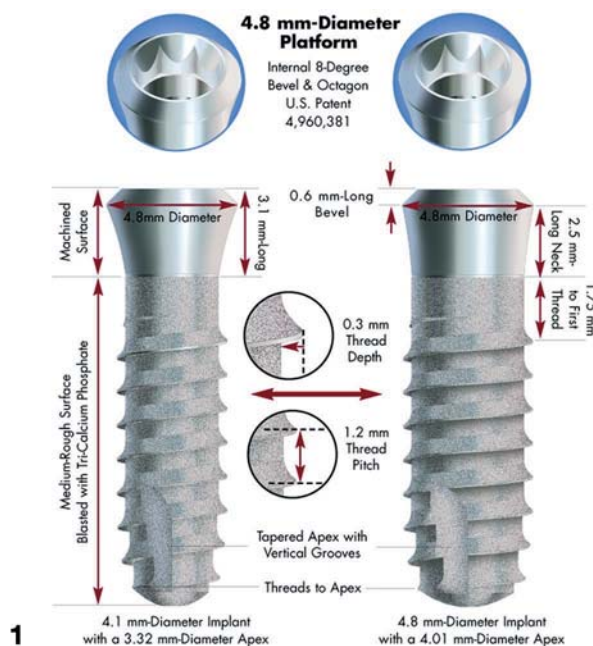


Fig. 1. SwissPlus implants are manufactured in two diameters with the system's universal internal octagon prosthetic platform.

Fig. 2. Tapered SwissPlus implants are manufactured in two diameters with the system's universal internal octagon prosthetic platform, and the smaller diameter implant is also available with an internal hexagon prosthetic platform for narrow interdental areas.

thetic platform options. One is the internal bevel-and-octagon prosthetic platform (4.8 mm in diameter) that is standard for the system, and the other is an internal hexagon platform (3.8 mm in diameter). The latter is indicated when a narrow emergence profile is required, such as in the replacement of the lateral incisors or in

locations where drifting teeth have narrowed the mesiodistal dimensions. All SwissPlus and Tapered SwissPlus implants feature an external beveled shoulder that helps support overlapping, full-contour abutments, or as the restorative margin for narrow abutments with the internal bevel-and-octagon platform.

Table 1. Design Comparison between SwissPlus and Tapered SwissPlus Implants

Feature	SwissPlus	Tapered SwissPlus
Body style	Straight with slightly tapered apex	Full taper from neck to apex
Body diameters	4.1 mm and 4.8 mm	3.7 mm and 4.8 mm
Body lengths	8 mm, 10 mm, 12 mm, and 14 mm	8 mm, 10 mm, 12 mm, and 14 mm
External thread style	Single, flat-based, 1.2 mm pitch	Double, flat-based, 0.9 mm pitch
Thread depth	0.3 mm	3.7 mm-diameter implants: 0.3 mm 4.8 mm-diameter implants: 0.6 mm (neck) to 0.3 mm (apex)
Platform (diameter, connection)	4.8 mm, internal bevel and octagon	4.8 mm, internal bevel and octagon 3.8 mm, internal hexagon
Apex	Self-tapping grooves and threads Threaded to implant bottom	Self-tapping grooves and threads Threaded to implant bottom
Delivery system	Combination fixture mount/transfer/abutment	Combination fixture mount/transfer/abutment

SwissPlus and Tapered SwissPlus share some common features in addition to significant design differences.

Table 2. Design Differences between SwissPlus and ITI synOcta Implants

SwissPlus	ITI synOcta
MTX surface: Blasted with soluble hydroxyapatite, then washed with nitric acid	SLA surface: Blasted with small- and large-grit Al ₂ O ₃ , then etched with hydrofluoric acid
Relatively intact geometrical edges after roughening threads	Rounded geometrical edges after roughening threads
Slightly tapered apex	Straight apex
Threaded apex	Unthreaded apex
Self-tapping	Requires bone tap

SwissPlus and ITI synOcta implants share a similar prosthetic platform, internal octagon connection, and overall macrodesign, but differ in surface treatment and apical configuration.



Fig. 3. SEM Examination: SwissPlus implants with (top, left to right): (1) surgical cover screw (2 mm long); (2) fixture mount/transfer/abutment; (3) straight abutment; and (4) threaded apical end. ITI synOcta with (bottom, left to right): (1) cover screw; (2) SwissPlus fixture mount/transfer/abutment; (3) ITI solid abutment; and (4) unthreaded apex.

Thread geometry (shape, angle, and depth) directly affects the biomechanical and load-bearing capacity of the implant.⁴⁶ In addition to the double external thread pattern, the 3.7 mm-diameter tapered implants feature 0.3 mm-deep, flat-based threads over the entire length of the body (Figs. 1 and 3). In contrast, the flat-based threads of the 4.8 mm-diameter tapered implant are 0.6 mm deep at the widest, coronal area of the implant body, but gradually diminish to a depth of 0.3 mm at the implant's narrowest, apical end (Fig. 1). The deeper threads at the top of this implant are designed to increase surface

area and enhance initial stabilization, especially in soft bone.

Surgical Protocols

Both the tapered and straight implants are designed for self-tapping insertion into a socket prepared with straight drills. As the narrow, apical end of the implant begins self-tapping into the osteotomy, the increasing diameter of the implant body is designed to compress the interfacial bone, which can lead to higher insertion torque than conventional screw-type implants.⁴¹⁻⁴⁴ The osteotomy for the straight implant design is created by sequential cutting with straight twist drills (Fig. 4). In contrast, two different surgical protocols based on bone quality are used to prepare osteotomies for the tapered implants. In low-density, type 4 bone,⁴⁷ the osteotomy preparation for the tapered implant stops with the intermediate drill (Fig. 5), which leaves the socket undersized relative to the widest diameter of the tapered implant body. This feature is also designed to facilitate full engagement of the 0.6 mm-deep threads on the coronal aspect of the 4.8 mm-diameter tapered implant. In higher-density, types 1 to 3 bone,⁴⁷ a final-

sizing step drill (Fig. 6) creates a straight socket that narrows to a small-diameter, apical portion designed for self-tapping thread engagement by the apical end of the implant. Because osteotomies for tapered implants require less bone removal than for straight implants, tapered designs are often selected for use in immediate extraction sites, or in areas with anatomical limitations, such as between convergent tooth roots or in ridges with undercuts.^{48,49}

Intersystem Compatibility Evaluations and Insertion Performance

Because of similarities in the macrodesign and prosthetic platforms of the straight SwissPlus and ITI synOcta implants, dimensional analyses and physical testing of implant insertion performance were conducted to determine the ability to interchange surgical drills between the two systems. If the implant thread dimensions and drill diameters from the two systems were dimensionally similar and the implants yielded adequate thread engagement in the walls of the receptor site during insertion, then it was hypothesized that the drills from the two

systems could be considered interchangeable.

In vitro evaluations of implant insertion were conducted in oak and balsa wood to determine the number of revolutions to full seating and maximum insertion torque for implants placed in prepared receptor sites. While no conclusions can be drawn between the clinical performance of implants placed in wood as compared with implants placed in human jawbone, the former are materials cited in the dental literature as providing a range of densities analogous to that of high-density (type 1)⁴⁷ and low-density (type 4)⁴⁷ bone, respectively.⁵⁰ Therefore, these test materials were selected strictly for the purposes of mechanical evaluations and comparisons. The SwissPlus and ITI synOcta test implants were 4.1 mm in diameter, and the Tapered SwissPlus test implants were 3.7 mm in diameter (Table 3). All test implants were 12 mm long.

Dimensional Analyses of Implant Threads and Surgical Drills

Using a RAM optical comparator (RAM Optical Instrumentation, Irvine, CA), the thread pitch and major diameter of SwissPlus and ITI synOcta implants were measured, and the drills from both systems were measured for depth demarcations and cutting edge diameters. Scanning electron microscopy (SEM) was also used to examine the implant threads that were subjected to the MTX (SwissPlus) and SLA (ITI synOcta) roughening procedures (Table 2).

Drilling Efficiency and Implant Insertion Performance

Wooden dowels measuring 0.5 inch in diameter and 1.0 inch in length were mounted in a vise-stabilized digital torque gauge (Mark-10 Corporation, Hicksville, NY). Implant receptor sites were prepared in the wood by sequential cutting with the prescribed surgical drills for each system (Table 3) in a 16:1 reduction contra angle (Nouvag AG, Goldach, Switzerland). In addition, the receptor sites for the ITI synOcta implants were further prepared with the system's bone tap.

Each implant was assembled on the driving tool designated for that system, and the assembly was con-

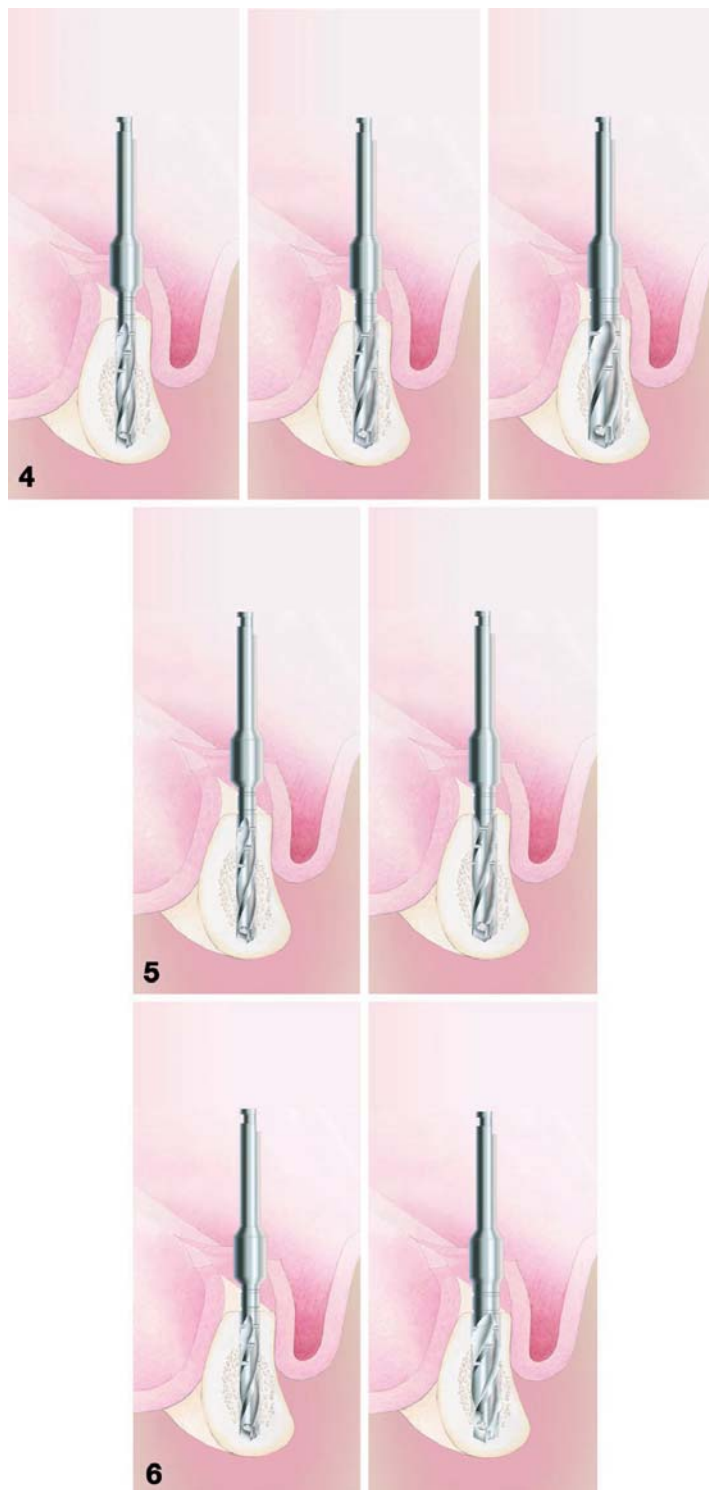


Fig. 4. SwissPlus Surgery: A universal drilling sequence is used for all bone densities: (left) pilot drill, 2.3 mm diameter; (middle) intermediate drill, 2.8 mm diameter; and (right) final drill, 3.5 mm diameter. This preparation is for the 4.1 mm-diameter implant, which is self-tapped into the osteotomy.

Fig. 5. Tapered SwissPlus Surgery: In low-density bone, the osteotomy sequence for the 3.7 mm-diameter Tapered SwissPlus implants consists of: (left) pilot drill, 2.3 mm diameter; and (right) intermediate drill, 2.8 mm diameter. The implant compresses the bone to the final diameter during seating.

Fig. 6. Tapered SwissPlus Surgery: In higher density bone, the osteotomy sequence for the 3.7 mm-diameter Tapered SwissPlus implants consists of: (left) pilot drill, 2.3 mm diameter; and (right) step drill, 3.4 mm/2.8 mm diameter.

Table 3. Instruments Used for Implant Receptor Site Preparation

Implant	Drills	Tap
Tapered SwissPlus, 3.7 mm diameter (protocol for low density bone)	Pilot drill, 2.3 mm diameter Twist drill, 2.8 mm diameter	Self-tapping
Tapered SwissPlus, 3.7 mm diameter (protocol for higher density bone)	Pilot drill, 2.3 mm diameter Twist drill, 3.4/2.8 mm diameter	Self-tapping
SwissPlus, 4.1 mm diameter (protocol for all bone densities)	Pilot drill, 2.3 mm diameter Twist drill, 2.8 mm diameter Twist drill, 3.5 mm diameter	Self-tapping
ITI Solid Screw, 4.1 mm diameter (protocol for all bone densities)	Twist drill, 3.5 mm diameter	Bone tap, 4.1 mm diameter

SwissPlus, Tapered SwissPlus and ITI synOcta shared similar drill diameters, but differed in the area of bone tapping.

nected to a digital torque wrench (Fig. 7). The apical end of the implant was placed into the top of the test receptor site, and the wooden dowel was scored to indicate the starting location of the torque wrench handle. While manually stabilizing the implant and using the score line on the dowel as a reference, the ratchet handle was turned one full 360° revolution to allow the implant's threads to engage the walls of the test receptor site. SwissPlus and Tapered SwissPlus implants were allowed to self-tap into their respective receptor sites according to the manufacturer's surgical protocol. The insertion torque value displayed on the torque gauge's digital readout was recorded. These procedures were repeated until the implant was fully seated, and the number of revolutions to full seating was recorded.

Intersystem Thread Compatibility

SwissPlus and ITI synOcta implants were self-tapped into holes prepared with drills from the opposite system to evaluate thread engagement. The implants were also inserted into sockets prepared in oak dowels that were pretapped with the ITI synOcta bone tap to determine implant thread compatibility with the thread pattern created by the bone tap.

RESULTS

Dimensional Analyses of Implant Threads and Surgical Drills

SwissPlus and ITI synOcta implants were found to have the same thread pitch and major diameter. The final drills for the two implants measured 3.4 mm and 3.5 mm, respec-

tively, in their major diameters (Table 3). They were also found to have the same depth demarcations and were within 0.06604 mm (0.0026 inches) of having the same diameter. Under SEM magnification, the geometrical shape of the SwissPlus implant threads appeared to be relatively intact after the MTX surface treatment, and the ITI synOcta implant threads appeared rounded from the SLA surface treatment (Fig. 2).

Drilling Efficiency and Implant Insertion Performance

While no differences in cutting efficiency at the drill tips were detected, the ITI synOcta drills also featured a sharp cutting flute on the drill shank, which produced a slightly oblong hole during preparation of the receptor

sites. All test implants met or exceeded maximum insertion torque requirements and minimum thread engagement requirements.

Seating performance evaluation data are presented in Tables 4 and 5. The tapered apical ends of the SwissPlus and Tapered SwissPlus helped to align the long axis of the implants with the long axis of the test receptor sites, and the apical threads on these implants also engaged the receptor sites and stabilized the implants sooner than the ITI synOcta implants. The double lead thread on the Tapered SwissPlus produced 1.78 mm of linear travel per implant revolution in comparison with 1.26 mm of linear travel for the ITI synOcta implant. Consequently, Tapered SwissPlus seated in

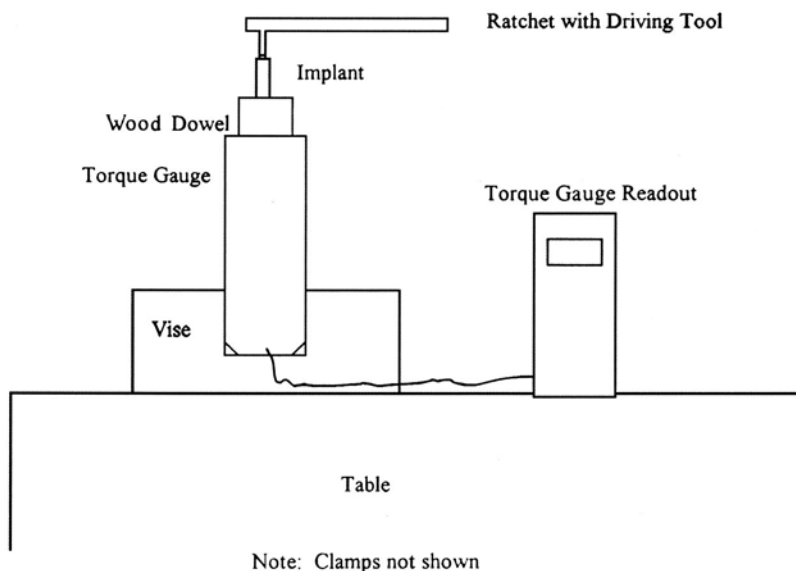


Fig. 7. Test station set-up for the Implant Insertion Performance analysis.

Table 4. Implant Seating Performance in Simulated Low-Density Bone (Balsa)

Revolution Cycles to Full Seating	Torque per Revolution (Ncm)											
	Tapered SwissPlus				SwissPlus				ITI synOcta			
	Sample			Average per Cycle	Sample			Average per Cycle	Sample			Average per Cycle
1	2	3	1		2	3	1		2	3		
1	1.13	1.13	1.13	1.13	1.13	1.69	1.13	1.36	1.13	0.57	0.57	0.79
2	1.69	1.69	1.69	1.69	1.69	1.69	2.26	1.92	1.13	0.57	1.13	0.90
3	2.26	2.82	2.26	2.49	2.26	2.26	2.26	2.26	1.13	1.13	1.13	1.13
4	3.40	3.95	3.95	3.73	2.26	2.82	2.26	2.49	1.13	1.13	1.13	1.13
5	3.95	5.08	5.08	4.75	2.82	3.40	2.82	3.16	1.69	1.13	1.13	1.36
6	4.52	6.78	7.34	6.21	3.40	4.52	3.39	3.73	1.69	1.69	1.69	1.69
7	6.21	7.91	9.04	7.68	3.39	4.52	3.95	3.95	2.26	1.69	1.69	1.92
8					3.95	5.08	4.52	4.52	2.82	2.26	2.26	2.49
9					4.52	6.21	5.65	5.42				
Average per sample	3.28	4.18	4.41	Cumulative average 3.84	2.82	3.62	3.16	Cumulative average 3.16	1.58	1.24	1.36	Cumulative average 1.47

All three implant designs seated at fairly similar rates in the low-density material.

Table 5. Revolution Cycles to Full Implant Seating in Simulated High-Density Bone (Oak)

Revolution Cycles to Full Seating	Torque per Revolution (Ncm)											
	Tapered SwissPlus				SwissPlus				ITI synOcta			
	Sample			Average per Cycle	Sample			Average per Cycle	Sample			Average per Cycle
1	2	3	1		2	3	1		2	3		
1	3.95	5.08	5.08	4.75	8.47	9.04	9.04	8.81	0.5	0.2	0.35	0.35
2	11.30	16.95	19.77	16.04	19.77	18.64	16.95	18.42	1.05	0.25	0.5	0.60
3	27.13	44.06	45.19	38.75	27.12	31.64	22.03	26.89	1.35	0.5	0.65	0.83
4	57.06	82.48	84.74	74.80	33.90	44.63	33.33	3.30	1.9	1.15	1.1	1.38
5	83.61	122.59	118.07	108.13	45.19	53.67	43.50	47.45	2.15	1.5	1.5	1.72
6					54.23	62.71	51.97	56.27	2.35	1.8	1.65	1.93
7					62.71	64.97	57.62	61.80	2.5	2.3	2.15	2.32
8					67.23	70.05	61.58	66.32	2.5	2.65	2.35	2.50
9					70.62	75.70	67.23	71.18				
10					72.31	80.22	74.57	75.70				
Average per sample	36.61	54.23	54.57	Cumulative average 48.47	46.21	51.18	43.84	Cumulative average 47.00	20.22	14.58	14.62	Cumulative average 16.38

Double lead threads enabled Tapered SwissPlus to fully seat in five revolutions, whereas pretapping enabled ITI synOcta to seat two revolutions faster than the self-tapping SwissPlus.

fewer revolutions than the SwissPlus and ITI synOcta implant.

In simulated low-density bone (balsa) (Table 4), self-tapping Tapered SwissPlus implants achieved full seating in seven revolutions with an average torque of 3.84 Ncm, self-tapping SwissPlus seated in nine revolutions with an average torque of 3.16 Ncm, and ITI synOcta implants seated in eight revolutions with an average torque of 1.47 Ncm in pretapped receptor sites. In simulated high-density bone (oak) (Table 5), self-tapping Tapered SwissPlus achieved full seating in five revolutions with an average torque of 48.47

Ncm, self-tapping SwissPlus seated in 10 revolutions with an average torque of 47 Ncm, and the ITI synOcta seated in eight revolutions with an average torque of 16.38 Ncm in pretapped receptor sites.

Intersystem Thread Compatibility

Yield thread engagements were found to vary by less than 0.508 mm (0.002 inches) with interchanged components in the receptor sites. All implants achieved acceptable thread engagement and tapping torque when placed into sites prepared with drills from the opposite system (Table 6). Because of the absence of a cutting

flute on the ITI synOcta implant, more pressure was required to initiate it into the drilled receptor site in comparison with that of the SwissPlus implant. Pretapping the receptor site with the ITI synOcta bone tap enabled implants from both systems to be inserted with acceptable thread engagement and the same amount of torque, regardless of which system drill was used to prepare the site before tapping.

DISCUSSION

In the analysis of implant seating performance (Tables 4 and 5), both the straight and Tapered SwissPlus de-

Table 6. Insertion Torque Results in Receptor Sites Prepared with Interchanged Surgical Drills in Simulated High-Density Bone (Oak)

Implant	Drill	Type of Bone Tap	Average Maximum Torque	
			Bone Tap	Implant
ITI synOcta 4.1 mm diameter, 12 mm L	SwissPlus Twist Tri-Spade drill 3.5 mm diameter	None	None	0.501 Nm (4.41 in-lbs)
SwissPlus 4.1 mm diameter, 12 mm L	ITI Twist drill 3.5 mm diameter	None	None	0.699 Nm (6.15 in-lbs)
ITI synOcta 4.1 mm diameter, 12 mm L	SwissPlus Twist Tri-Spade drill 3.5 mm diameter	ITI bone tap	0.226 Nm (1.99 in-lbs)	0.267 Nm (2.35 in-lbs)
SwissPlus 4.1 mm diameter, 12 mm L	ITI Twist drill 3.5 mm diameter	ITI bone tap	0.228 Nm (2.01 in-lbs)	0.269 Nm (2.37 in-lbs)
SwissPlus 4.1 mm diameter, 12 mm L	SwissPlus Twist Tri-Spade drill 3.5 mm diameter	ITI bone tap	0.200 Nm (1.76 in-lbs)	0.265 Nm (2.33 in-lbs)

SwissPlus and ITI synOcta surgical drills were found to be interchangeable between the two systems.

signs demonstrated higher insertion torque than the ITI synOcta implants in both high- and low-density simulated bone. This can be attributed to the different bone-tapping protocols of the two systems. The number of implant revolutions to achieve full seating also reflects the design differences between the two systems. In high-density simulated bone, the apically threaded straight SwissPlus implant required 10 revolutions to achieve full seating, versus eight revolutions for the ITI synOcta implant, which lacks apical threads. In low-density simulated bone, the difference was nine revolutions to eight revolutions, respectively. The double lead threads of the Tapered SwissPlus implant reduced the number of insertion revolutions to achieve full seating in both low- and high-density bone. In the latter, the Tapered SwissPlus seated in half the number of revolutions⁵ required to seat the straight SwissPlus.¹⁰

CONCLUSIONS

Tapered implant designs have expanded the benefits of oral implantology to patients previously excluded from implant therapy because of anatomical limitations. Self-tapping insertion of the Tapered SwissPlus implant into an undersized, straight socket may provide additional mechanical stability in patients with low-density bone. Mechanical testing in this study provides preliminary data on differences between the SwissPlus and ITI Systems, as well as between SwissPlus and Tapered SwissPlus. The results in this report should be consid-

ered preliminary and more in-depth research is needed in these areas.

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DISCLOSURE

The author claims to have a financial interest in Sulzer Dental, Inc. whose product is mentioned in this article.

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ZUSSAMENFASSUNG: Die Erhaltung des eingesetzten Implantats bei schlechter Knochensubstanz stellt nach wie vor eine maßgebliche Herausforderung für den behandelnden Zahnarzt dar. Das SwissPlus System verfügt über einteilige, gerade und spitz zulaufende Implantate mit eigenständiger Gewindebohrung, Apikalfäden und einer mikrostrukturierten Oberfläche am in das Knochengewebe übergehenden Teil des Implantats. Obwohl sich beide Implantatarten als für jegliche Knochendichte geeignet ausweisen, zeichnet sich das spitz zulaufende SwissPlus-Modell durch doppelte Bleifäden und eine spezielle Technik zur sanften Behandlung des Knochengewebes aus, um eine Verbesserung der mechanischen Stabilität zum Zeitpunkt des Implantateinsatzes zu erreichen. Der vorliegende Bericht befasst sich mit einer auf die chirurgischen Aspekte fokussierten Übersicht über das SwissPlus System. Die aufgeführten Testergebnisse weisen ebenfalls auf Kompatibilitäten zwischen unterschiedlichen Systemen und Unterschiede zwischen den geraden SwissPlus und den ITI-Syn-Octa Implantaten hin.

SCHLÜSSELWÖRTER: Zahnimplantate, einstufig, interne Verbindung, eigenständige Gewindebohrung, mikrostrukturierte Oberfläche

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ABSTRACTO: La supervivencia del implante en hueso de pobre calidad continúa creando un desafío clínico de importancia para los dentistas. El Sistema SwissPlus incluye diseños de implantes cónicos y rectos de una sola pieza con roscas apicales auto perforantes y una superficie microtexturada en la parte intraoseo del cuerpo del implante. Mientras que ambos diseños pueden usarse para una amplia gama de densidad del hueso, el SwissPlus cónico utiliza roscas dobles principales y un protocolo de cirugía para hueso blando diseñado para mejorar la estabilidad mecánica inicial en el momento de la colocación. Este trabajo presenta una reseña del Sistema SwissPlus con énfasis en los aspectos quirúrgicos. Los datos de las pruebas presentadas también ilustran la compatibilidad entre sistemas y las diferencias entre los implantes rectos SwissPlus y ITI syn-Octa.

PALABRAS CLAVES: implantes dentales, etapa simple, conexión interna, auto perforante, superficie microtexturada

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SINOPSE: a duração de implantes em osso de baixa qualidade continua a representar um desafio clínico para odontólogos. O sistema SwissPlus é composto de uma peça, com um design reto e outro cuneiforme, com rosca de vértice auto-vedante e uma superfície com microtextura na porção intra-óssea dos corpos de implante. Embora ambos os designs sejam indicados para todas as variações de densidade óssea, o SwissPlus vedado apresenta rosca de filete duplo e um protocolo cirúrgico de osso macio projetado para melhorar a estabilidade mecânica inicial no momento do posicionamento. Este estudo apresenta uma visão geral do sistema SwissPlus com ênfase nos aspectos cirúrgicos. Os dados de teste apresentados também ilustram a compatibilidade entre sistemas e as diferenças entre o SwissPlus reto e os implantes syn-Octa.

PALAVRAS-CHAVES: implantes odontológicos, estágio único, conexão interna, auto-vedante, superfície com microtextura

SwissPlus™インプラントシステム、パート1：外科上の要因と他システムとの比較

著者：ジョエル・ローゼンリクト、DMD*

概要：質の劣る骨におけるインプラントの維持は臨床的困難が大きい。SwissPlusシステムは、インプラントボディーの骨内部分にセルフタッピング根尖ネジと微構造表面を使ったワンピースのストレートタイプまたはテーパタイプのインプラントデザインである。ストレート型、テーパ型ともに、すべての骨密度に適用可能である。テーパ型のSwissPlusはダブルリード・スレッドとソフトボーン外科プロトコルを使用し、設置直後の機械的安定が高いデザインとなっている。本論文はSwissPlusシステムの概観を、外科的局面を中心に紹介する。単純SwissPlusシステムとITI syn-Octaインプラントの相互適合性と違いを示すテストデータも提供される。

キーワード：デンタルインプラント、シングルステージ、内部結合、セルフタッピング、微構造表面

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