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TiOblast™ – The Surface of Choice

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Cover: The TiOblast™ surface in high magnification.

DOCUMENTATION

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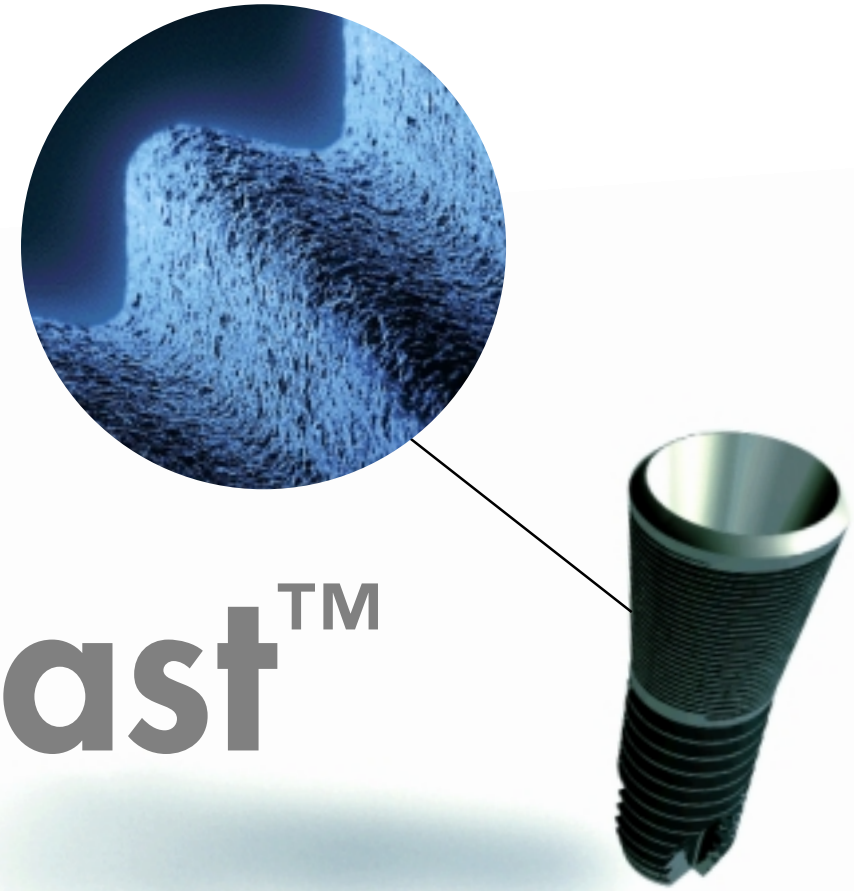


TiOblast™

State of the Art

Rough implant surfaces have during the last years been acclaimed to have certain benefits when compared to machined surfaces. TiOblast™ is the implant surface of choice for clinicians concerned with using implant components and methods presented together with evidence based claims.

Astra Tech currently provides the only enhanced implant surface with complete documentation – TiOblast™. Other implant manufacturers provide rough surfaces on their implants, and while some have pre-clinical scientific data to back up their claims, there is limited clinical data available.

Surface design and documentation

The story behind TiOblast™ tells of a documentation and development process as good as it gets. In the early 1990's Astra Tech hypothesized that an implant surface with a "rougher" surface would provide a better bone to implant interface. This was based on clinical results with an early ►

Summary

TiOblast™ is the only enhanced implant surface backed by comprehensive documentation and long-term follow-up studies. The delvelopment and documentation processes include:

- Theoretical modeling
- Pre-clinical in vivo and in vitro documentation
- Human histology
- Clinical documentation.

It is concluded that the TiOblast™ surface provides outstanding and predictable results with superb survival/success figures for implants with marginal bone levels.

version of the Astra Tech Dental Implant that provided greater mechanical interlock in the bone and a stable marginal bone level. Other system's published data from animal studies also reported better quantitative and qualitative bone responses when a rough implant surface was used[1, 2]. Even if these papers did not define the micro-topography of the surfaces used, there was a strong indication that rougher implant surfaces could provide better results than those of the prefered machined or turned surfaces.

The most common way to make the implant surface rougher was to coat it through a plasma spraying technique. This coating could be either titanium plasma spray (TPS), or hydoxyapatite coating (HA-coating). However, these methods had some drawbacks including the coating coming loose from the implant surface and peri-implant infections. Moreover, their design was not based on well defined biological or biomechanical principles, and the production process did not give a defined and well-controlled result.

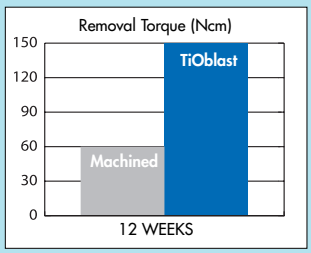
The TiOblast™ surface was designed according to the idea that the micro-topography of the implant surface should meet defined biological criteria. It should be possible to produce the surface in a well defined way and the chemistry of the implant surface should not be jeopardized through any coating procedure.

In his thesis, Stig Hansson presented a theoretical model of the TiOblast™ surface based on biological and biomechanical principles[3]. Through a blasting method, where the blasting media is TiO_2-particles with defined properties, it was possible to create an implant surface with the desired micro-topography without contamination of the surface. When this surface was tested in experimental animal and in vitro studies, it provided data that supported the proposed model[3–6]. Both qualitative

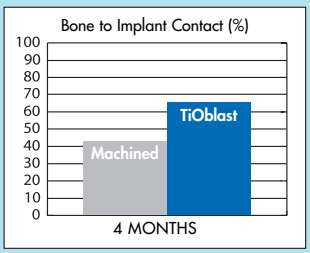
TiOblast™ claims

- **TiOblast™** is the only rough implant surface modeled from both biological and biomechanical principles[3–6].
- **TiOblast™** has been documented and compared to machined surfaces with the results being published in peer-reviewed scientific journals. The results show qualitative and quantitative advantages for the TiOblast™ surface on the bone to implant interface in dog mandible[8, 9] and rabbit tibia models[10, 11].
- **TiOblast™** has been documented with human histology showing significant increased bone to implant contact compared to machined surfaces[7].
- **TiOblast™** is documented in several clinical studies with up to 5 or more years follow-up[12–17].

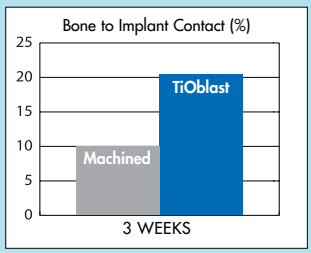
Gotfredsen et al 1992. [8]



Ericsson et al 1994. [9]



Gotfredsen et al 1995. [10]



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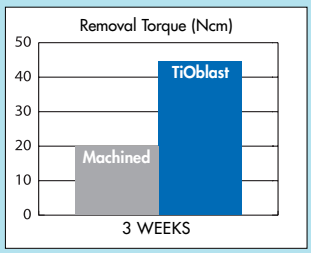

and quantitative bone measurements gave significantly better results for TiOblast™, when compared to a machined surface. Human histology is also available presenting the same positive results for TiOblast™ when compared with a machined surface[7].

From documented clinical results using the TiOblast™ surface, it can be concluded that it gives outstanding predictable results with survival/success figures in the range of 98–100% for upper and lower jaws with marginal bone levels in a steady state before loading. ■

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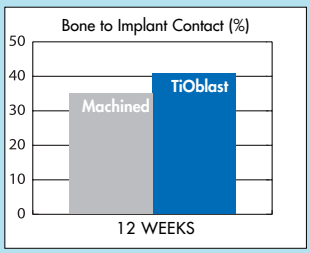
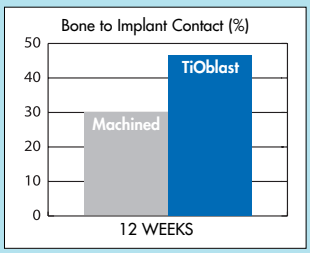
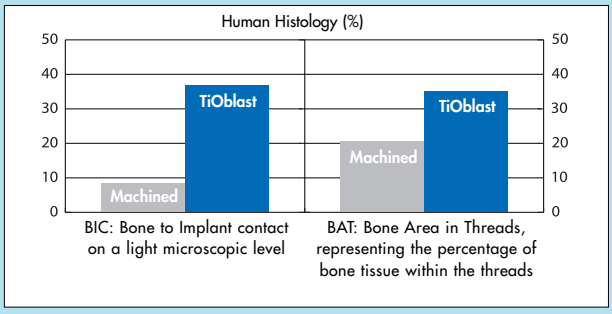


Wennerberg et al 1996. [11]



Ivanoff CJ. [7]



Maintaining the Bone

Preliminary Results of a 5-Year Prospective Study

For many patients, the loss of a single tooth can create functional, esthetic and psychological problems. It is not unusual that young patients with an otherwise intact dentition need a single tooth restoration because of trauma and/or aplasia.

Ulf Karlsson, DDS
Department of Prosthodontics and Periodontology, Norrköping, Sweden

For many patients, the loss of a single tooth can create functional, esthetic and psychological problems. It is not unusual that young patients with an otherwise intact dentition need a single tooth restoration because of trauma and/or aplasia. The introduction of osseointegrated titanium implants, as anchors for single tooth restorations, offers the possibility of tooth preservation. This treatment preserves the anatomy of the alveolar ridge better than conventional prosthetic treatment and provides a better esthetic and functional result.

Six centers participated in this open prospective study in Scandinavia. A total of 47 patients (26 males and 21 females) were treated with Astra Tech Fixture ST. The Fixture ST is a screw shaped and self-tapping fixture made of commercially pure titanium, with a coronally tapered part characterised by microthreads and a surface which has been roughened by blasting with titanium particles, TiOblast™.

Summary

To document the long-term outcomes of single-tooth replacement, 47 Fixture ST implants were placed according to standard protocols. Implant survival rate was 100%, mean marginal bone loss very low and the soft tissue health was maintained.

TiOblast™ microthreaded implants from Astra Tech can be used for single-tooth restorations to:

- achieve successful integration with high predictability
- preserve the surrounding bone level
- maintain esthetics and soft tissue health.

1. Single-tooth restoration maxillary left central incisor. Man 36 years old.

2. Single-tooth restoration in the position of maxillary right lateral incisor. Female 24 years old.

Preliminary results

Implants were placed according to guidelines in a two-stage procedure and allowed to heal for 3 months in the mandible and 6 months in the maxilla before being uncovered. Radiographs were taken at cementation of the prosthetic restoration and, following cementation, at yearly intervals for a period of 5 years.

A total of 47 implants were placed, 37 in the maxilla and 10 in the mandible. Forty-three patients received porcelain-fused-to-metal crowns and 4 received all ceramic crowns as prosthetic restorations. Three patients had to have dehiscences covered with Gore-Tex® membrane (W.L. Gore, USA). No implants were lost and hence there was an implant survival rate of 100% over 5 years and the marginal bone level was maintained with very limited bone loss. This is consistent with other studies on Astra Tech Fixture ST.

Most bone loss took place during the healing period and remained stable after loading. 80 % of the patients experienced less than 1.0 mm bone loss over a 5-year period.

Signs of peri-implant inflammation were noted in 3 patients but easily resolved with professional cleaning and hygiene instruction. Minor retraction of the buccal soft tissue was seen in 4 patients, but did not exceed 1 mm in any case.

Few complications

In this study, 6 of 47 patients (13%) were lost to follow-up, which is comparable to other published studies[1]. Bone level was maintained with very limited bone loss which has been shown in other studies on Astra Tech Fixture ST[2, 3].

Abutment loosening may sometimes occur in single crown restorations. In a study using an implant system with a flat top hex design, a high incidence of screw loosening was reported, especially during the first year of loading[1]. During the present study, only 4 abutments needed retightening, confirming the results of other studies showing the internal conical fixture-to-abutment connection to be very stable[4, 5].

Some authors have suggested that roughened fixture surfaces may increase the risk of soft tissue inflammation due to plaque accumulation. In this study, superficial inflamma- ►

3. Radiograph taken at baseline.

4. Radiographs taken at 3-year follow-up.

tion of the peri-implant mucosa was seen in only 3 patients, a finding which is consistent with other documentation[6]. This shows that the TiOblast surface of Astra Tech implants is not associated with an increased incidence of peri-implant inflammation compared to implants with machined surfaces.

Conclusion

The preliminary results from this prospective multicenter study show that TiOblast microthreaded Astra Tech Dental Implants can be used in single tooth restorations to:

- achieve successful integration with high predictability
- preserve the surrounding bone level
- maintain esthetics and soft tissue health. ■

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Surgical Innovations

Two New Techniques in Mandibular Preprosthetic Reconstruction

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This article illustrates two patients and two different surgical techniques used in the mandible where the bone volume of the alveolar crest was insufficient for installation of dental implants.

Distraction technique

Vertical distraction osteogenesis[1,2] was chosen as the technique for bone augmentation in this case involving total edentulism in the mandible. A 78-year-old healthy woman had previously experienced an attempted installation of dental implants in the lower jaw. This was discontinued due to the limited amount of bone available in the horizontal aspect (Fig.1).

Ridge expansion

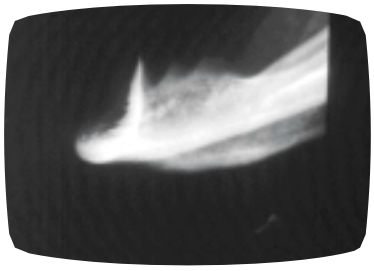
Under general anesthesia, a 1.5 mm titanium miniplate distractor apparatus (Martin Medizintechnik GmbH, Germany) was applied horizontally to the mandible (Figs. 2 and 3). A horizontal through-and-through osteotomy of the mandible between the mental foramina was carried out allowing a 70-mm-long segment to be mobilized (Fig. 4). The expansion screw of the device penetrated the ▸

Summary

In patients in whom there is insufficient mandibular bone for dental implants, restoration of the jaw must be preceded by augmentation of the recipient bone. In this article, two cases are reported in which different surgical techniques – vertical distraction osteogenesis and the 'tent-pole procedure' of bone grafting are used to increase bone volume prior to prosthetic installation. Both these techniques were found to be effective in providing a platform for subsequent implantation of stable dental fixtures.

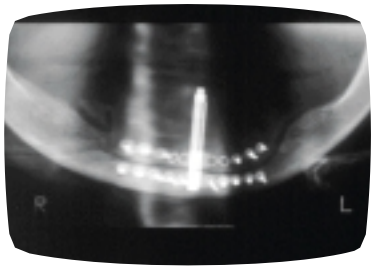
Distraction Technique

Deficiency in the bucco/lingual aspect of the anterior mandible

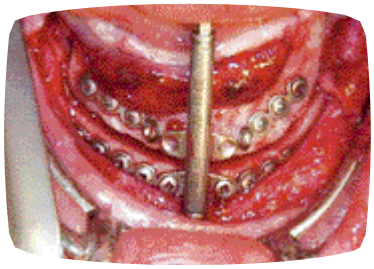


1. Thin alveolar crest of the mandible.

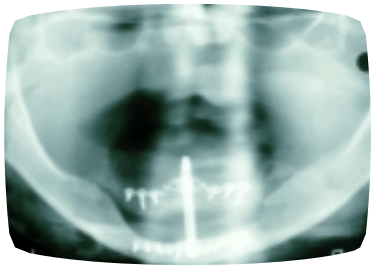
2. Horizontal osteotomy of the mandible.



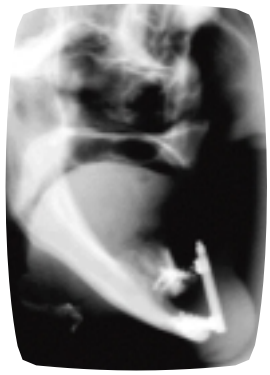
3. Distraction apparatus in place.



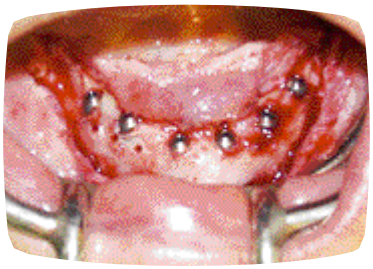
4. Clinical appearence of mounted distractor.



5. Distraction complete.



6. Radiological appearance after 3 months.



7. Fixtures in place.

8. Clinical result of the final restoration.

mucosa in the patient's vestibulum, and after a period of six days this screw was used to activate the distraction apparatus.

The patient could extend the bone gap by 1 mm per day at home. The distraction gap was widened for 12 days and then the distractor was left in place for 3 months to consolidate the gap (Fig. 5).

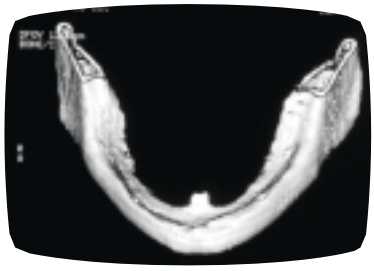
Implant installation and restoration

After this period, the clinical situation was found to be stable, but the gap showed no radiographic signs of mineralization (Fig. 6). Therefore, with the patient's age in mind, the healing time was prolonged by 2 months. Under conscious sedation and local anesthesia, the distraction device was removed and fixtures installed. Six Astra Tech TiOblast™ fixtures (Astra Tech Implants, Mölndal, Sweden) of 15 mm length and 3.5 mm gauge were installed (Fig. 7). Mineralized bone was clinically and histologically evident in the gap of the osteodistraction.

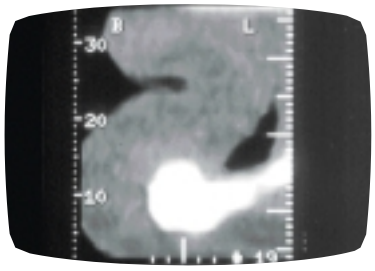
After three months the implants were uncovered and healing abutments were connected. The implants were found to be stable in clinically healthy bone and the sagittal relationship to the upper jaw was favorable.

Bone grafting with platelet gel

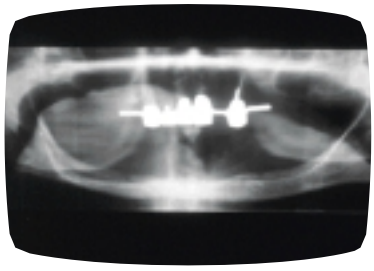
Deficiency in the vertical dimension of the anterior mandible



9. 3-D reconstruction from CT-scan of mandible preoperatively.



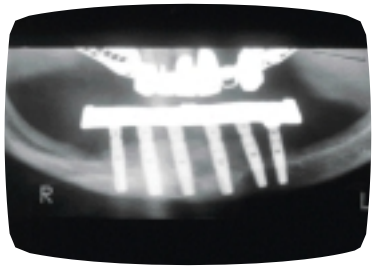
10. Frontal tomography indicating a small amount of residual bone.



11. Panorex showing preoperative status.

12. Fixtures installed.

13. Bone graft and platelet gel covering fixtures.



14. 6-months radiological follow-up.

A fixed bridge was then fabricated, thus completing the treatment (Fig. 8).

Bone grafting with platelet gel

In some cases, resorption of the mandible is extremely progressive. This second case illustrates a situation in which the patient presented with a maximum residual bone height of 6 mm (Figs. 9, 10, 11). The patient, a 71-year-old woman, had severe problems with a prosthesis that could not be worn satisfactorily. The instrumentation for osteodistraction of a mandible with such a small amount of vertical residual bone was not commercially available at this time so an alternative technique was chosen.

Extra-oral incision

Under general anesthesia, the anterior mandible was exposed through an extraoral submental incision. The lingual insertions of the tongue muscles were kept in place during dissection together with as much of the lingual periosteum as possible. The areas around the mental nerves were properly exposed and protected.

Six Astra Tech Microthread™ fixtures (15 mm length and 3.5 mm gauge) were placed between the mental foramina in approximately 6 mm of bone (Fig. 12). Particulated bone from the inner cortical table of the patient's iliac crest was mixed with an autologous platelet gel and placed around and between the fixtures (Fig. 13). No communication with the oral cavity through the oral mucosa could be seen. The flap, with the periosteal envelope created, was then folded back to the original submental position and sutured back in place, covering the mandibular bone, fixtures and bone graft.

Prosthetic construction

After 2 months and 3 weeks, abutments were placed using a standard intraoral technique. The supporting grafted bone was well vascularized and minimally resorbed. The prosthetic part of the treatment could then be initiated and finished. Due to a pronounced Class II relationship, a bar (Fig. 14) was constructed and

attached to the fixtures so that the patient could wear a removable denture. In this way, the risk of overloading the fixtures due to unfavorable bite forces was eliminated.

Discussion

Distraction osteogenesis, as used in case one, is a technique that was developed for clinical orthopedic use by Ilizarov.[3] Primarily developed for lengthening of extremities, it was further developed for oral and maxillofacial use during the last three decades.[4–6]

Case two describes a technique "the tent-pole procedure" developed by Dr Robert Marx at the University of Miami (personal communication, 1998). Initiated by Tayapongsak et al.[8], Marx has further developed and described the use of autologous platelet gel for mandibular reconstructions.[9] The basic philosophy behind this concept is that growth factor-containing α-granulae in platelets enhance bone graft maturation. Further, gel (with platelets) adds molding ability to the particulated graft. With the fixtures as space-holding poles and periosteum as a tent, as in this case, the bone is kept in place and held stationary for the important initial two weeks when the graft is revascularized. The patient can start using the remodeled old prosthesis after these two weeks of initial healing, but care must be taken that the prosthesis does not cause pressure to the end sides of the grafts. This was seen to some extent in the second case and caused some marginal bone loss on the posterior fixture bilaterally. Despite the short follow-up time of 13 months, the result has been stable and promising.

In conclusion, new concepts and novel ideas in preprosthetic mandibular reconstruction, developed by innovative surgeons, allow patients a second chance of having a fixed prosthesis on dental implants and will improve their quality of daily life. The above described techniques can be useful in problematic cases where vertical augmentation of the deficient mandibular alveolar crest must be performed. ■

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Optimizing Esthetics
Angled Abutment System

The new Angled Abutment provides esthetic solutions for screw retained prosthesis in situations where fixtures are placed in buccally inclined positions.

The new Angled Abutment system provides angled abutments that fit all fixtures in the Astra Tech Dental Implant System.

The abutments are connected to the fixtures with a tight and stable relation created by the Conical Seal Design™.

Clinical handling procedures are simplified and improved with the new product.

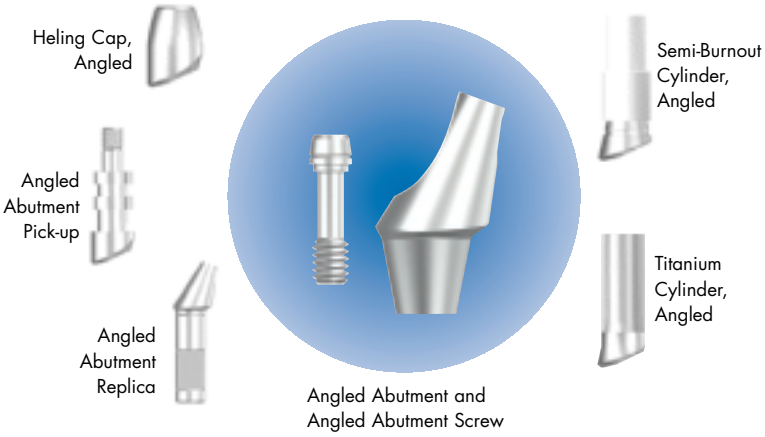
Simplicity	*One solid component*
Esthetics	*No buccal vertical abutment height-no knee*
Reliability	*Secure installation*

The Angled Abutment consists of an abutment and an abutment screw and is manufactured from commercially pure titanium, grade 4. It has an angle of 20° from the axial direction of the fixture and is seated and retained to the fixture via the Angled Abutment Screw. It has a low shoulder design for high esthetics and can be rotated 360° and secured in the desired position.

Properties

Abutments can easily be placed in parallel positions. An indexing feature is provided on the Angled Abutment to facilitate a correct position of the abutment or abutment replica during the prosthetic procedures. Four different configurations of the Angled Abutment are available: 3.5, 4.0, 4.5/5.0 and 4.5/5.0 High, which can be combined with any of the fixtures in the Astra Tech Dental Implant System. It is connected to the fixture and tightened with the Angled Abutment Screw using a Hex Screwdriver or a Hex CA driver, the recommended torque is 25 Ncm.

The Angled Abutment System also includes prosthetic and laboratory components, designed for precision and ease-of-use during every clinical and laboratory step, from impression on abutment level to the final installation of the preferable restoration. ■



An Improved Prosthetic Option

Solving Difficult Cases

Even with adequate planning and routine use of surgical stents, fixtures might be placed in buccaly inclined positions. The new Angled Abutment from Astra Tech makes it possible for the prosthodontist to solve these cases satisfactory even with screw retained prosthesis.

Erland Eggum, DDS,
Specialist in Prosthodontics, Sola, Norway

Esthetic problems tend to appear in cases with buccally inclined implants using screw-retained restorations. The new and improved Angled Abutment makes it possible to achieve optimal esthetics in these cases.

Planning

Placing angled abutments in an optimal position directly in the mouth requires careful planning. This is particularly the case in full arch restorations in need of multiple angled abutments. The fact that these components can be rotated in the implant without any lock mechanism provides unlimited positioning possibilities. In addition, the angulation between abutments and inclination of any adjacent teeth have to be taken into consideration. Therefore, we strongly recommend that the first impression is taken at fixture level. This recommendation also applies to registration of the horizontal and vertical relations and the try-in of teeth in wax.

Placing Angled Abutments

The try-in work from the laboratory

Summary

The new Angled Abutments for the Astra Tech System are adaptable and easy to use. They can be rotated 360° and easily combined with existing Uni Abutments in the Astra Tech System. Thus the Angled Abutments allow the optimal positioning of implants in most difficult cases and still achieving optimal esthetics and function.

1. Bridgework only with the Uni Abutment.

2. The new Angled Abutment in combination with the Uni Abutment.

3. Angled Abutments placed in the mouth.

4. Impression taking on the Angled Abutment using the Angled Abutment Pick-up.

5. Try-in of the metal framework with the Semi-Burnout Cylinder, Angled as a base.

6. Occlucal view of the supraconstruction using the new Angled Abutment after replacing the Uni Abutment shown in picture 1.

should make the suggested placement and length of the abutments apparent for the dentist, guiding him in his effort of optimal positioning in the patient's mouth. After the correct placement of the angled abutments, the dentist can choose whether to make a control cast from an alginate impression or to go directly for the final impression.

The dentist should make sure the abutments are tightened with the recommended torque (25 Ncm).

Final impression

The angled abutment pick-ups and the guide pins are used on the seated angled abutments, ensuring the indexing feature fits correctly. An impression is taken in a custom made tray with for instance polyether impression material. Between patient sessions, angled healing caps should be placed on the abutments to avoid the ingrowth of soft tissue. Where angled abutments are inclined palatally this is of particular importance, due to the increased amount of displaced gingival tissue.

If the patient is wearing a full denture, it will have to be adjusted to the width and height of the healing cap and a soft lining will give the denture sufficient retention during the treatment period.

Try-in of the metal framework

By using a temporary bridge for a period of time, possible esthetic, hygienic, functional and phonetic problems can be detected. The try-in of the metal framework should be done carefully until it is perfectly seated. Having studied the situation on the working model, the dentist will know exactly when the restoration is correctly seated.

Final restoration

The final restoration should be performed using regular laboratory techniques. The bridge work is secured with bridge screws at the recommended torque 15 Ncm.

Conclusion

The Angled Abutment from Astra Tech is a new important component for solving difficult cases. In order to avoid buccal screw holes in buccally inclined implants the Angled Abutment is an outstanding prosthetic option. ■

References

1. Balshi TJ, Ekfeldt A, Stenberg T, Vrielinck L. Three-year evaluation of Brånemark Implants Connected to Angulated Abutments. Int J Oral Maxillofac Implants 1997;12 :52-58.

2. van Steenberghe D, De Mars G, Quirynen M, Jacobs R, Naert I. A prospective split-mouth comparative study of two screw-shaped self-tapping pure titanium implant systems. Clin Oral Impl Res 2000;11 :202-209.

New Components – Same Procedures

The Angled Abutment by Astra Tech will help the dental team in achieving optimal esthetic and functional restoration. It is used for screw retained prosthetics and gives the clinician total freedom for placing the abutment, in 360° rotational freedom.

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Study model

When the clinician has taken an impression at the fixture level for the study cast, the laboratory can fabricate a study model. In order to check the position of the fixture, the guide pin for fixture impression can be used as a direction indicator in the replica. A try-in of prefabricated teeth and a wax-up can be done at the fixture level to evaluate the clinical situation. In this way it is easier for the clinician to make the correct decision on what abutments to use.

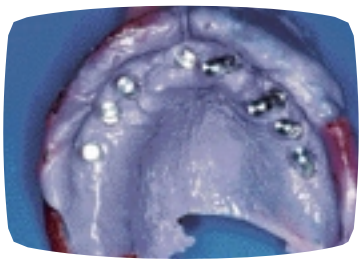
The impression and working model

A custom made tray is fabricated in the laboratory and sent to the clinic for an abutment level impression. When the laboratory receives the final impression it is important to make sure that the inside of the angled abutment and uni abutment pick-ups are free from impression material. It is also important to make sure that the pick-ups are secured in a stable position in the tray and impression material. Place the angled

Summary

The Angled Abutment is a valuable new addition to the Astra Tech Dental Implant System. It has several advantages over existing abutments:

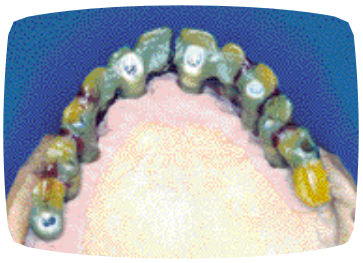
- The abutments can be placed with 360° rotational freedom.
- It is adaptable to multiple clinical situations.
- It prevents the necessity for holes in the buccal veneer of the crown.



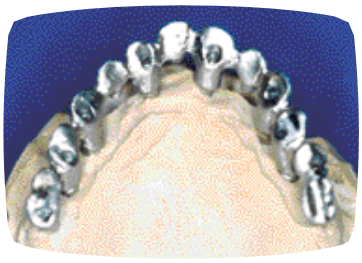
1. Angled Abutment Replicas placed in the working model.

2. The final working model with Uni Abutment Replicas and the new Angled Abutment Replica.

3. A wax-up with prefabricated teeth is finished for the first try-in.



4. Complete wax up for the final restoration.



5. Make sure the screw channels are free from investment and nodules.

6. Final restoration with occlusally and palatally placed screw holes.

abutment replicas in the impression pick-ups to transfer the angled abutment position to the working model. The replicas are secured with the guide pin in the designated pick-ups. Hold the replica with a plier in a firm grip when tightening the guide pin. In this way, rotation of the pick-up in the impression material is avoided. If the replicas cannot be placed due to divergence, it is possible to grind directly on the replicas to make sure that they are not in contact. Fabricate the working model with a removable gingiva modeling material and a high quality stone material.

Wax up and try-in

Regular working procedures for screw-retained restorations can be used when working with angled abutments. By using angled semi-burnout cylinders, a wax-up with prefabricated teeth can be created. When the wax-up is completed, a facial occlusal impression is taken on the construction as a reference. The construction is sent to the clinic for try-in, allowing the clinician to control the position of the angled abutments. A bite registration can also be carried out. This gives the first indication how to fabricate the construction, which has to meet the esthetic and functional requirements.

Temporary bridge

Temporary restorations give us useful information. A successful temporary restoration builds the foundation for a successful final restoration with satisfied patients and few recalls.

Final restoration

The semi-burnout cylinders are attached to the angled abutment replicas by using the bridge screws. The plastic sleeve on the cylinders is adjusted to fit the clinical situation. Fabricate the framework by applying wax to the cylinders. After the wax-up is completed the framework is invested, casted and devested, using regular working procedures. Carefully remove the bulk of investment with devesting scissors. Blast the metal framework with glass-beads. Remove residual investment in the cylinder base by using a picking agent (e.g. hydro-fluoric acid or alternative). Make sure the screw channels are free from investment and nodules. The porcelain is then applied using traditional working procedures.

For further information on handling procedures, the "Creating Passive Fit" manual, based on the Uni Abutment, can also be applied for the Angled Abutment. ■

Mia Jensen, DDS
Clinical Information Manager, Dental
Astra Tech AB

Keep Updated with Scientific Literature

Do you find it difficult to keep updated with the latest scientific literature on dental implants? Does it require a lot of time and effort to read and digest the important articles you need to be familiar with?

In order to facilitate awareness of scientific articles connected to the Astra Tech Dental Implant System, Astra Tech introduces a new publication, the ***Documentation Summaries.***

The Astra Tech Documentation Summaries, Volume 1, contains 15 summaries of articles that have been published in highly respected implant journals. They have been summarized by Dr Michael Norton, UK and cover different aspects of the Astra Tech Dental Implant System, presenting both pre- and clinical results.

Biomechanical papers included in Volume 1 cover such issues as the comparative strengths of the Conical Seal Design™ and a flat top hex system, stress distribution along the implant neck and different aspects of thread design. Comparison is also made between TiOblast™ surface and machined surfaces. Dr Abrahamsson and co-workers have analyzed the peri-implant tissues surrounding submerged and non-submerged Astra Tech implants and they document the Astra Tech Dental Implant System as successful in both one- and two-stage situations.

Also in Volume 1, treatment of totally edentulous patients with fixed prostheses as well as overdentures is described in two separate 5-year studies. Comparing fixed prosthesis attached to Astra Tech or Brånemark implants, professor van Steenberghe presents the 2-year results of a 5-year prospective split-mouth study, while Dr Åstrand reports the 1-year results on totally edentulous patients treated with fixed prostheses. The successful maintenance of marginal bone is illustrated in a prospective 5-year study of the Fixture ST headed by professor Richard Palmer, of Guys Hospital, London. Another paper from the same center compares the clinical, radiographic and microbiologic results from Astra Tech and Brånemark implants.

If you would like to keep updated on the recent scientific literature involving Astra Tech implants, the Astra Tech Documentation Summaries will quickly increase your knowledge. To order the Documentation Summaries, please contact your local Astra Tech representative or e-mail us at editor.insight@astratech.com.

All original articles are available as reprints through Astra Tech. ■

Astra Tech
Advanced Course

The Astra Tech Advanced Implant Surgery Courses held in collaboration with the Department of Oral and Maxillofacial Surgery at the Faculty of Odontology, Göteborg University, has during the last years become very appreciated.

The first of two courses this year was held in March 28th–30th. The course focused on live surgery demonstrations showing different bone grafting techniques. One case of maxillary osteotomy was demonstrated with inlay bone grafting according to a technique developed by professor Kahnberg, who also is responsible for the course.

Sinus lifting procedures with bone grafting from different sites was included as well as fixture installations and abutment connections in grafted cases.

Clinical and experimental studies on bone grafting techniques were presented and updated the attendants on recent scientific documentation.

The participants, oral surgeons from Italy, were very satisfied with the course and appreciated the interesting clinical demonstrations as well as the pleasant atmosphere at the department. ■

Calendar 2001

Insight Vol. 4, Iss. 1

SEPTEMBER 12-16	**AAOMS, American Association of Maxillofacial Surgeons, Annual Mtg** *Orlando, FL, USA*
SEPTEMBER 13-16	**EAO, European Association of Osseointegration** *Milan, Italy*
OCTOBER 6-10	**AAP, American Academy of Periodontology** *Philadelphia, PA, USA*
OCTOBER 12-13	**London 2001, International Implant Congress** *London, UK*
OCT. 31-NOV. 3	**ACP, American College of Prosthodontists** *New Orleans, LA, USA*
MARCH 14-16, 2002	**AO, American Academy of Osseointegration, 17th Annual Mtg,** *Dallas, TX, USA*

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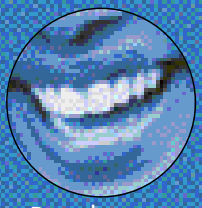
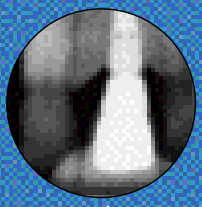
Optimal performance by superior design

ASTRA TECH IMPLANTS
DENTAL SYSTEM

SIMPLICITY ESTHETICS RELIABILITY



Prosthetics



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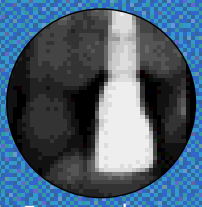

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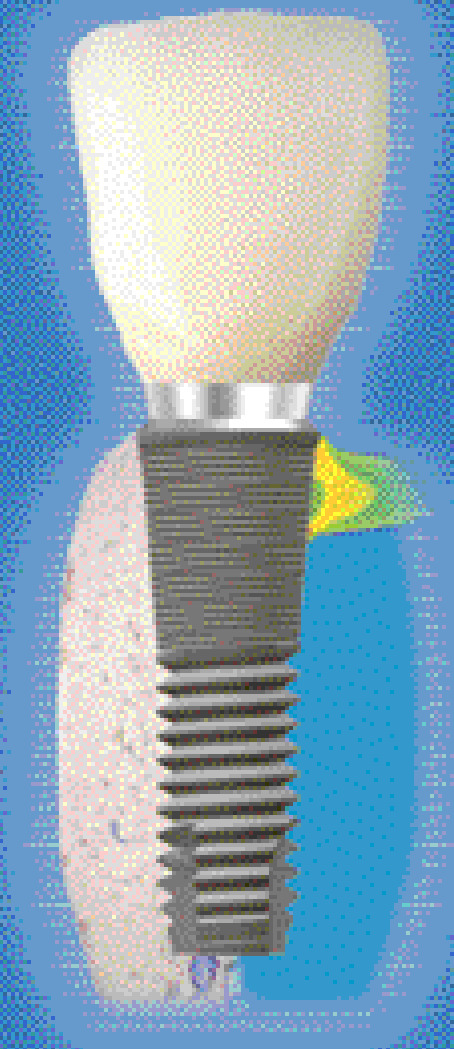
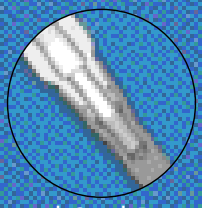
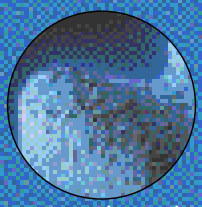




Conical Seal Design™



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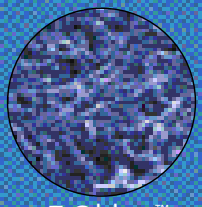

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