

One-piece AQB Implant System Recommended for GPs

The two major trends in implant treatments in Japan since the 1980's

The two implant treatments includes **Titanium-based osseointegrated** 2-piece implants, and **Hydroxyapatite-Coated (HA-based) biointegrated** 1-piece implants. Those two major trends have been developed and refined over the past 40 years.

Since the titanium system was widely used in Europe and the U.S., it has been adopted and used for treatment and education at GPs and dental schools in Japan. HA implants have been used mainly by GPs since the 1990s, and research on HA implants has been particularly active in Japan. **In the early days, HA-based implants had poor coating technology**, and many of them deteriorated and fell out over time. To resolve it, **ADVANCE Co.Ltd** developed extremely pure **recrystallized hydroxyapatite coating, 1-piece AQB implant in 1994**, with Institute for Medical and Dental Engineering, Tokyo medical and Dental University.

Therefore, this implant has overcome the disdain for HA-based implants, and has been supported by enthusiastic AQB users for 30 years to this date.

Comparisons of both systems

	Ti-based 2-piece system	HA-based 1-piece system
System Basics		
Structure	The fixture into the bone, and the abutment to cover the super-structure	Fixture and abutment are connected to form a single unit
Screwed Joint	Screwed connection at the depth of the bone surface	No need for screwing
Number of surgeries	The connection can make a micro gap One stage method requires only one placement surgery, but two stage method requires implantation surgery and fenestratio surgery to connect the abutment.	No micro gaps like two piece system Only one implantation surgery
Superstructure	There are two types: cemented , such as crowns and bridges, and screwed through access holes.	Cementation of crowns or bridges
Cost of materials	The cost would be high since many parts and materials are required in the process of treatments, as well as high laboratory technical fees.	The cost can be low , since the material cost is only for the implant bodies, and the laboratory technical fee must be as same as for the natural teeth.
Early stages of placement		
When the initial fixation is loose	Neither of both One or Two stage techniques, would not be exposed to occlusal forces in the early stages, which makes them insulated from occlusal trauma . They maybe exposed to occlusal trauma, when temporary dentures were placed on the top for esthetic purposes.	The abutment protrudes into the oral cavity, so if the apex of the abutment is shaved to create enough clearance to make it less exposed to occlusal trauma, bone integration will begin in 3 to 4 weeks . Alternatively, temporary fixation with a nearby tooth or implant that is less prone to movement can lead to bone integration.
Post-implantation stage		
Observation	The observation of bone integration is difficult in the post-implantation stage, because of the mucous membrane covering the implant in the two-stage procedure.	The abutment protrudes into the oral cavity, allowing accurate diagnosis of the integrated state by perform percussion .
Superstructures		
Fabrication method	Requires extremely complexed process compared to 1-piece procedure. The healing cap would be removed in the secondary surgery, the healing abutment would be placed, then the superstructure would be fabricated after healing.	As similar as for natural teeth, crowns and bridges can be placed by impression taking just below the gingival margin, with the abutment formed.
Occlusal trauma		
Bone resorption	Bone resorption occurs from the superficial layers, but the progresses is slow in general .	Because of the rough surface , bone resorption can easily progress and become difficult to preserve if left untreated.
Prevention, Remedies	Unless bone augmentation procedures are performed with Membrane or bone substitute, postoperative bone regeneration cannot be expected . Early detection during the maintenance, occlusal adjustment and surgical procedures for peri-implantitis are required.	Occlusal adjustment and surgical treatment can be done when detected early by maintenance. Postoperative bone regeneration can be expected when a healthy HA layer remains .
Damage of implant body	Loosening and fracture of the screwed point can occur . Those were the biggest two problems with 2-piece implants until a decade ago.	Loosening and dislocation due to cracks in the HA layer can occur . Strong clenching can also cause fracture in the upper part of the root.
Prevention, Remedies	Fractured screws are difficult to remove , and generally require surgical fixture removal and	Non-weight bearing period may result re-integration , if there is no surrounding bone

re-insertion, or sleeping within bone and change to other prosthetic methods. resorption with the removal of the superstructure. If re-integration is difficult, or the fracture is in the upper part of the root, the root may be removed or sleeping.

Development Concept of AQB Implant

Development concept of 1-piece AQB Implant

The apatite sintered implant "Apaceram®" made by Asahi Kougaku Co., Ltd. released in 1983, was the first revolutionary implant that bone can biointegrate, but it had the problem of being brittle and easily broken.

After that, early HA-based implants that were plasma-coated titanium were problematic because of their low purity.

To solve this, ADVANCE Co., Ltd. developed a technology to plasma-spray β -TCP, a precursor of HA, onto pure titanium, and then convert it into a high-purity recrystallized HA coating by hydrothermal treatment.

In anticipation of the era of GPs rather than specialists in the near future, the one-piece one-step method was chosen, and the surface is made of apatite.

In the spirit of "simple is the best," the 1-piece AQB implant® was born in 1994, with the aim of simplifying the implantation technique and materials.

Recrystallized HA coating



the surface is covered with apatite crystal structures

Features and Advantages of 1-piece AQB

Features and advantages of 1-piece AQB

- ① Both the form and procedure are simple and similar to natural teeth
- ② HA-based give early biointegration and high occlusal support
- ③ 7 mm of space to mandibular canal is enough for 6 mm product
- ④ 3 mm product could be used for narrow bone widths
- ⑤ Forming on subgingival is similar to natural teeth, that guarantee aesthetics
- ⑥ Can gradually transition to AQB Cr-Br while using partial denture
- ⑦ No requirement for autogenous bone graft nor bone substitute during the socket lift
- ⑧ Can be used simultaneously with orthodontic treatments
- ⑨ Can provide low cost implant treatments

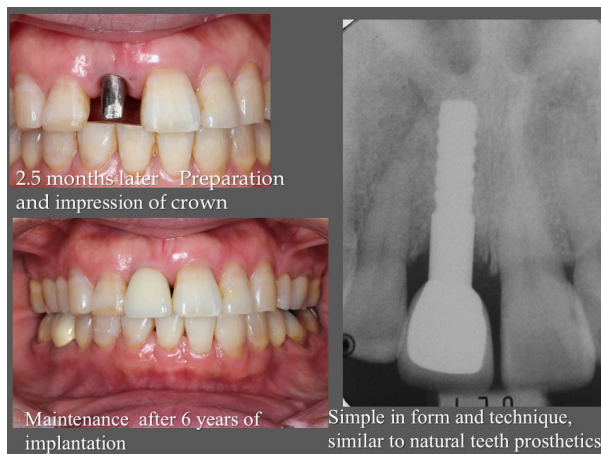
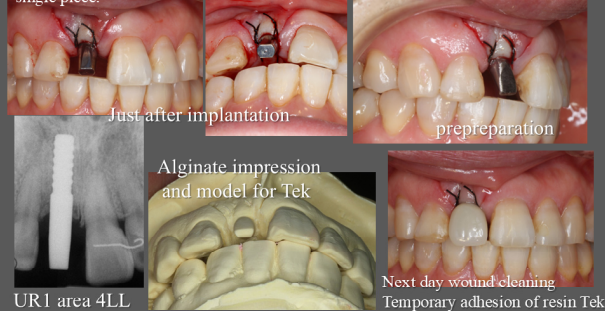


Treatment flow of typical cases ①

Features and Advantages①; Both the form and procedure are simple and similar to natural teeth

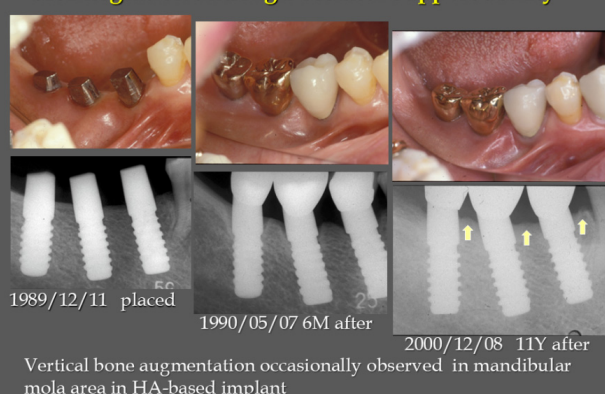
The AQB to be implanted tends to be protrusive. Therefore, when forming the implant socket, the starting point is determined to be the palatal side of the jawbone. And finally, in the most favorable direction as far as possible.

And finally, if the tooth axis can be modified by forming the abutment tooth on the labial side, the crown can be placed in the same manner as natural teeth even with a single piece.



Treatment flow of typical cases ②

Features and Advantages ②; HA-based, early biointegration and high occlusal support ability



Summary of the characteristics of biointegration

- ◆ Early bone integration is the greatest feature of HA implants
- ◆ After implantation, the mild dented cone-shaped bone formation that temporarily occurred by the surgical invasion of implant height formation at the alveolar crest caused, will regenerate and become flat within a few years
- ◆ In some cases, vertical bone augmentation can be observed in the mandibular molar area, as in this case
- ◆ Compared to titanium implants, which osseointegrate, HA implants biointegrate, so X-ray images often suggest that the body is obtaining bone form and creating the bone structure necessary for the implant to support the bite
- ◆ There have been many experiences that make us feel that HA implants are living things, such as bone regeneration when appropriate occlusal adjustment is made to counter bone resorption caused by overload
- ◆ However, don't overestimate the ability to support the bite.



Simple is the Best

シンプル&
確実な手法で

HAインプラントは、HAの純度、HA結晶性だけでなく形状もHAの力を決定する重要な要素。インプラント体周囲の骨の生成においては、骨芽細胞がHA結晶の先端に付着し生体内でHAを造成する過程でエビタキシャルな成長をし、結晶性に連続性のある、より強固なインテグレーションを実現します。AQBは歯根部の再結晶化HA表面は、まるでイタリタリのような形状、ほぼ100%の結晶化度で理想的な結晶状態を有します。この表面形状がAQBの早期かつ強固な骨結合を可能にする証なのです。

資料請求先

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