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[Provision of a toothless lower jaw with pre-fabricated telescopes on single-stage implants]

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[Illustration 1:
Pre-drilling
using a
Linkow
Miller]



[Indices: Single-stage implants, telescope, toothless lower jaw]

{This article shows a simple, cost-effective and uncomplicated method of creating fixed and functioning tooth prosthesis in a toothless lower jaw, using two implants. This method is particularly suitable for countries, where dental technology is not yet so advanced and where the dentist can only rely on himself.}

The desire to repair or to replace a defect or lost body parts is as old as mankind itself. However, in all those years the methods were not able to provide for the adequate and satisfactory repair of the chewing organ. As techniques improved, materials became significantly more sophisticated and in spite of all that, missing teeth could only be replaced in a fixed manner, if there were sufficient existing teeth, while healthy teeth had to be ground. Especially in the case of non-disposition and the loss of individual teeth, the conventional provision of the missing teeth was problematic and traumatic.

However, the most common problems existed in the case of patients without teeth, for who even the improved prosthesis materials and modern impression methods were unable to compensate for the instability of the mucosa-supported total prostheses. The resulting atrophy of the jaw, especially in the lower jaw, led to a massive loss of function of the chewing organ and often to a 'capitulation' before the anatomy.

In the course of the 20th century various surgical methods were developed in order not only to replace the 'chewing surfaces' for patients, but also to insert new 'tooth roots' for them.



[Clearly shortened treatment duration in comparison to conventional two-stage systems.]

[Illustration 2: Surgery Set Trinon Q1]

Dental implantology has been scientifically recognised by the German Association for Dental, Oral and Orthodontic Diseases since 1982. Especially during the last 20 years implantology has brought about a change in the provision of implant-supported tooth prostheses. Soon there may be a time when a court will have to decide whether the failure to recommend an implant will constitute a breach of the duty of a doctor to inform a patient (bodily harm through grinding vital teeth).

[Material and Methodology]

The Q1 implant (Trinon Titanium, Karlsruhe) is a single-stage pure titanium implant, which is used in the lower jaw and in a stable upper jaw (D1-D2). Due to the atraumatic procedure and the possibility of the immediate provision of prosthesis, the treatment period can be significantly reduced in comparison to conventional two-stage systems. Simple treatment processes, minimal cost framework and a small inventory make this concept very interesting even for economically weak patients.

The implant has a self-cutting thread, which enables the bone-saving insertion of the implant body into the jawbone with an extremely low level of insertion trauma and required force. This is also of great importance for primary stability. During the development emphasis was placed on the design of a progression thread with lengthwise milling cut as bone trap, which distributes the chewing pressure evenly onto the bone. Bone grafts that collect in the milled groove due to the cutting action of the thread are re-organised in the course of the osteogenesis.

The Q1 implant is only available in a 'standard' and a 'short' version, which differ with regard to their length in the neck (standard: 4 mm, short = 2 mm). The implant is available with diameters of 3.5, 4.5 and 5.6 mm and with lengths of 8, 10, 12 and 14 mm. The implant head with a 7° cone has 4 symmetrical grooves and can be ground. The Surfoss II surface allows the secure insertion of the oestocytes. The implant system only needs a few instruments; the implants are gamma-sterilised and hygienically packed.

[Surgical Protocol for the Insertion of the Implant]

1. Opening with scalpel.
2. Pre-drilling with a Linkow miller (Illustration 1).
3. Pilot drill hole in order to establish the implant axis, using the pilot drill with a diameter of 1.5 mm and external cooling.
4. Determination of the definitive drill shaft using the shaping drill (within internal cooling).

For easy operating both drills have length markings cut in by laser.

5. The implant is first inserted by hand, then with the insertion wrench. That wrench is available in a short and a long version.
6. Then the implant is slowly turned into its final position using the insertion wrench. The insertion wrench is mainly used for the inserting of implants in the lower jaw, while in the upper jaw; the work is done mostly using the hand wheel.
7. A tight suture closure is a must.
8. This is followed either by the temporary or the final prosthesis.
9. The stability of the implant should be checked with the perio-test device.



[Illustration 3: Pre-operative state]



[Illustration 4: Pilot drill hole]

The time of the further prosthesis provision depends on various factors: Bone quality, primary stability, type of provision, localisation and healing of the wound. As a rule the definitive provision in the case of single stage implants is possible after 6 to 18 weeks. However, the first weeks are of decisive importance for osteointegration to occur.

[Optimum result and stable osteointegrated implants.]

During this time every type of trauma (wrong loading, bad oral hygiene, lack of checks, nicotine use and inflammations) should be avoided at all costs, in order to ensure an optimum result and stable osteointegrated implants.

Single-stage implants should not be chosen in the case of a screw-in torque below 20 Ncm, because otherwise a sufficient primary stability is not ensured, which in turn endangers a functioning osteointegration.

[Case Description]

In the case presented here, two Q1 implants were inserted interforaminally in the lower jaw of a 92-year old toothless patient (non-smoker) and afterwards provided with pre-fabricated telescopes.

1. Pre-operative state (Illustration 3)
2. Creation of the mucoperiosteum lobe
3. Pre-drilling with Linkow miller.
4. Pilot drill hole (Illustration 4).
5. After shaping drilling (Illustration 5).
6. Q1 implant length 14 inserted (Illustration 6) and lightly screwed in by hand.
7. After the removal of the caps, the hand wheel was placed on top of the implant and the implant was slowly screwed into bone as far as possible using fingers (Illustration 7).
8. The implant was carefully inserted with the insertion wrench to the final position in quarter turns (one rotation should take approx. 4-6 seconds! (Illustration 8).



[Illustration 5: After shaping drilling region 33, 43.



Illustration 6: Inserted implant



Illustration 7: After the removal of the cap the hand wheel is placed on top and screwed into the bones as far as possible using fingers



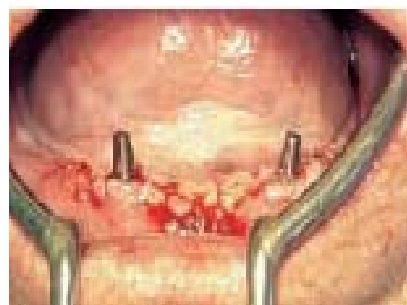
Illustration 8: Using the insertion wrench, the implant is inserted carefully in quarter turns until it reaches the final position



Illustration 9: Both implants are in the desired position.

9. Both implants are in the desired position (Illustration 9).
10. Due to the buccal bone infraction, a small bone built-up was carried out using BioOSS (Geistlich, Baden-Baden) (Illustration 10 to 12).
11. Tight suture closure using 4.0 Vicryl suture (Illustration 13).
12. Check after one day.

**Illustrations
10 to 12:
Bone built-up
with BioOss**



**Illustration 13: Tight suture
closure using 4.0 Vicryl suture**



Illustration 14: Check after one day.

The old prosthesis was ground out and softly relined with Softliner (GC), so that the two implants are not wrongly loaded during the first few weeks and so that osteointegration can take place without impediments.

After four weeks the prosthetic provision was carried out with pre-fabricated telescopes.

With regard to this the embedding of the implant heads in the Softliner material of the prosthesis provides good support immediately after the implantation. After four weeks the prosthetic provision was carried out with pre-fabricated telescopes.

The industrially produced, standardised titanium telescopes consist of two parts: primary and secondary telescope (Illustration 15). The primary telescope is cemented onto the implant, while the secondary telescope is built into the prosthesis using plastics.

13. State after 4 weeks (Illustration 16)
14. Primary telescope mounted for testing (Illustration 17).
15. Secondary telescope mounted for testing.
16. Primary telescope inserted and fixed with Permacem (company DMG).
17. Secondary telescope mounted with Vaseline (Illustration 18).
18. Grinding of prosthesis.
19. Cold polymeride (Paladur, Heraeus Kulzer) filled in (Illustration 19).

**Illustration 15:
Primary and Secondary
telescope.**





Illustration 16: State after 4 weeks.



Illustration 17: Primary telescope For testing.



Illustration 18: Secondary telescope mounted with Vaseline.



Illustration 19: Cold polymeride filled in

The prosthesis is inserted in the mouth and fixed by biting on it. After 5 minutes the prosthesis is removed and polished in the laboratory.

20. Worked out prosthesis with secondary telescopes (Illustration 20).

**Illustration 20:
Worked out
prosthesis**



The patient can load the prosthesis immediately; only during the first 24 hours a bit of care should be taken, in order to ensure the secure hardening of the cement.

Discussion

The Q1 implant with telescope provision constitutes a quick, effective and low cost method for providing a toothless lower jaw with a sufficient and stable prosthesis. Especially for financially poorer patients this is an affordable possibility to 'firmly re-anchor' a prosthesis for the complete lower jaw, which is fitting badly due to the anatomical situation. In addition, it is an implant system that is easy to learn, which enables implantologists who have not yet gained a lot of experience, to insert and provide implants quickly and without complications. Even using simple means, an adequate and functional prosthesis can be created. Especially in countries where the dental techniques are not as high as that in Germany - for reasons of cost and technical facilities, this is, of course, a great advantage.

Literature available from the authors.

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