ORIGINAL RESEARCH PAPER

Prosthodontics

KEY WORDS: Screwless Implants, Technology, Friction fit, Locking taper, Aesthetics

SCREWLESS IMPLANTS - A REVIEW

Dr. Kalpana D. Professor & HOD, Dept. of Prosthodontics, Dayananda Sagar College of Dental Sciences and Hospital, Kumaraswamy Layout, Bengaluru -560078.

Dr. Rajesh K S Prof and HOD, Dept. Artificial Intelligence & Machine Learning, Rajarajeswari College of Engineering, Bengaluru – 560074.

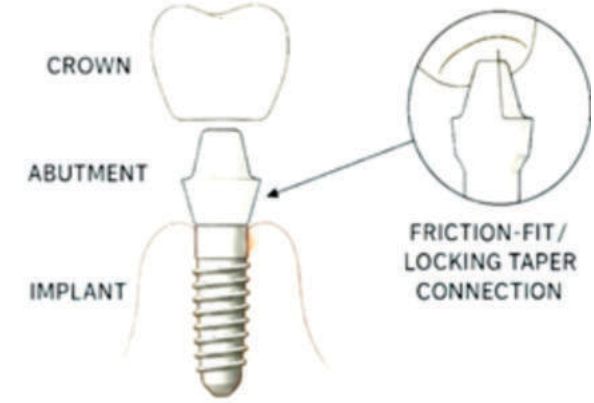
ABSTRACT

Screwless implants are a modern dental solutions for missing teeth using cement or friction fit [locking taper] to fix crowns directly to the implant. This option focuses on comfort, implant stability, and a more natural look without using visible screws. Screwless technology simplifies the dental procedure and enhances aesthetic appearance. This article describes about screwless implants.

INTRODUCTION

Tooth loss can affect your smile, but more importantly, your comfort and overall oral health. As one of the most beneficial traditional implants have been the standard for tooth replacement. However, screwless dental implants are changing the way patients and professionals approach in dental restoration.

Screwless dental implants are designed to replace missing teeth without using visible screws to secure the crown. Instead, they rely on dental cement or a precise friction-fit connection (locking-taper), which keeps the crown firmly attached. This approach removes the need for screw access holes and creates a clean, natural appearance that blends seamlessly with surrounding teeth.



Screwless Implants

Along with their aesthetic benefits, screwless implants are highly stable and reduce the risk of screw loosening or complications over time. They are placed in the bone just like traditional implants, so they function like natural teeth. Many patients also appreciate their comfort, durability, and easy maintenance, making them a reliable long-term option for restoring both function and comfort in their smile.

Screwless implants is designed to avoid the use of traditional screws when fixing the crown to the implant. The process of this dental procedure depends on which type of screwless implant is used, cement-retained or locking-taper.

Both systems begin with placing the implant into the bone and waiting for osseointegration. The screwless technology relies on either dental cement or a precision-fit connection to keep the crown stable.

a. Cement-retained Screwless Implants

In this method, no screw is used, but the crown is still attached to the implant using cement. This cement helps to bond the crown securely in place. This is, of course, easier than screw retained options, but can make future removal more difficult.

b. Locking Taper Implants

No screws and no cement are used in this type. The crown or abutment-crown unit fits tightly into the implant by using a special conical (tapered) connection. This method relies on friction to stay in place. The design of the locking taper allows for a strong and stable fit while also making future removal easier if needed.

Advantages of Screwless Dental Implants

Aesthetic Appeal and Natural Look

In screwless technology, there is no need for a screw access hole. This results in a more natural-looking dental restoration, which gives aesthetic satisfaction to patients. This is very beneficial, especially for the anterior teeth appearance, which is very important.

1. Comfort And Stability

Unlike screw-retained implants, there is no need for access holes, causing a more polished surface on the top of the crown. This makes the screwless implants feel more comfortable in the mouth, they provide a natural look, especially for front teeth. Also, because of the smoother design, there would be better adaptation and integration with the soft tissue around the implant, resulting in long-term gingival health and comfort.

2. Reduced Risk Of Complications

The screwless implants, especially the cementless or locking taper systems, creates a tight, friction-fit seal that reduces microleakage. Therefore, the risk of bacterial contamination and subsequent inflammation is very low.

3. Improved Longevity And Durability

Screwless implants avoid the mechanical stress points that

come with screw channels, they may last longer. The strong friction-fit or tapered connection distributes biting forces more evenly, reducing the fractures or loosening over time.

4. Easy Maintenance and Hygiene

The absence of screw access holes means there are fewer gaps where food particles or bacteria can accumulate. This simplifies oral hygiene for patients, making daily brushing and flossing more effective and reducing the chance of peri-implantitis.

5. Strong Bond Between Crown and Implant

Screwless systems often rely on precision engineering to create a stable, tight bond between the crown and the implant. This strong attachment mimics natural tooth stability, allowing patients to function without loosening.

Screwless Dental Implants - Indications

Enhanced aesthetics: screwless implants are particularly beneficial for the front teeth aesthetic appearance. The absence of screw access holes makes them a good choice.

Minimally invasive procedure: this method often involves minimal drilling and can result in a shorter recovery time.

Enough bone density: having a strong and dense bone is essential for the stability of screwless implants, especially if the friction-fit (locking taper) method is used.

History of screw-related complications: if issues like screw loosening or infection with previous implants, screwless implants are less prone to these problems.

Medical condition that affects healing: conditions like diabetes can influence recovery, so screwless implants are more beneficial because of their less invasive nature.

CONCLUSION

Screwless implants are Superior aesthetics; no visible screw hole , natural appearance. Reduced complications; minimizes the risk of screw loosening or fracture. Comfort and Function; functions like a natural tooth, comfort, durability and easy maintenance. Biocompatible; made from materials titanium or zirconia that integrate well with natural tissue.

REFERENCES

1. Enquist B, Nilson H, Astrand P: Single-tooth replacement by osseointegrated Branemark implants: a retrospective study of 82 implants. Clin Oral Implants Res 1995;6:238-245.
2. Henry PJ, Laney WR, Jemt T, et al: Osseointegrated implants for single-tooth replacement : a prospective 5-year multicenter study. Int J Oral Maxillofac Implants 1996;11:450-455.
3. Gibbard L, Zarb G: A 5-year prospective study of implant-supported single-tooth replacements. J Can Dent Assoc 2002;68:110-116.
4. Wannsfors K, Smedberg J-I: A prospective clinical evaluation of different single-tooth restoration designs on osseointegrated implants: a 3-year follow-up of Branemark implants. Clin Oral Implants Res 1999;10:453-458.
5. Bianco G, Di Raimondo R, Luongo G, et al: Osseointegrated implant for single tooth replacement: a retrospective multicenter study on routine use in private practice. Clin Implant Dent Relat Res 2000;2:152-158.
6. Mericske-Stern R, Grutter L, Rosch R, et al: Clinical evaluation and prosthetic complications of single tooth replacements by non-submerged implants. Clin Oral Implants Res 001;12:309-318.
7. Schwartz-Arad D, Samet N, Samet N: Single tooth replacement of missing molars: a retrospective study of 78 implants. J Periodontol 1999;70:449-454.
8. Dibart S, Warbington M, Fan Su M, et al: In vitro evaluation of the implant-abutment bacterial seal: the locking taper system. IntJ Oral Maxillofac Implants 2005;20:732-737.
9. Urdaneta RA, Marincola M: The Integrated Abutment CrownTM ,a screwless and cementless restoration for single-tooth implants: a report on a new technique. J Prosthodont 2007;16:311-318.
10. Andersson B, Odman P, Lindvall AM, et al: Cemented single crowns on osseointegrated implants after 5 years: results from a prospective study on CeraOne. Int J Prosthodont 1998;11:212-218.
11. Avivi-Arber L, Zarb GA: Clinical effectiveness of implant-supported single-tooth replacement: The Toronto Study. Int J Oral Maxillofac Implants 1996;11:311-321.
12. De Lillo A, Lombardo S, Chiado Cutin D, et al: In vitro evaluation of chromatic stability in new-generation composites. Minerva Stomatol 2002;51:371-376.
13. Chan C, Weber H: Plaque retention on teeth restored with full ceramic crowns: a comparative study. J Prosthet Dent 1986;56:666-671.
14. Adamczyk E, Spiechowicz E: Plaque accumulation on crowns made of various materials. Int J Prosthodont 1990;3:285-291.
15. Puchades-Roman L, Palmer RM, Palmer PJ, et al: A clinical radiographic and microbiologic comparison of Astra Tech and Branemark single tooth implants. Clin Implant Dent Relat Res 2000;2:78-84
16. Kalpana D, Comparative evaluation of one piece and two piece dental implants-A review, International Journal of Scientific Research. 2017;6.
17. Kalpana D, Implant Design Considerations- A Review, Indian Journal of Research, 2020;9