



A comparison between a Conventional Multi-unit Abutment and Adjustable-angle Multi-unit Abutment-Literature Review.

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Introduction

- Multi-unit abutments (MUAs) support screw-retained prostheses. However, conventional designs provide only fixed angulations (0° , 17° , 30°), requiring multiple abutment selections and limiting procedural adaptability.
- Adjustable abutments, such as Omnibut, allow continuous correction up to 30° , reducing prosthesis misfit and enhancing procedural efficiency.
- This review compares their biomechanical properties, clinical use, and prosthodontic application with emphasis on angulation, adaptation, and treatment efficiency.

Materials and methods

Literature and Regulatory Review

- Conventional multi-unit abutments:** Evidence was obtained from finite element analyses, stress distribution studies, and clinical reports assessing prosthesis success and biomechanical load transfer.
- Adjustable multi-unit abutments (Omnibut™):** Regulatory documentation, including FDA 510(k) clearance (K242064), was reviewed regarding mechanical testing and safety evaluation.

Mechanical Properties Evaluation

- The Omnibut™ system was assessed using ISO 14801 dynamic fatigue testing, retention testing, and laboratory evaluation under simulated functional conditions.

Comparative Parameters

- Range of angulation correction.
- Abutment selection requirements and efficiency of clinical procedures.
- Prosthesis fit and stress distribution.
- Range of clinical application and prosthetic system integration.

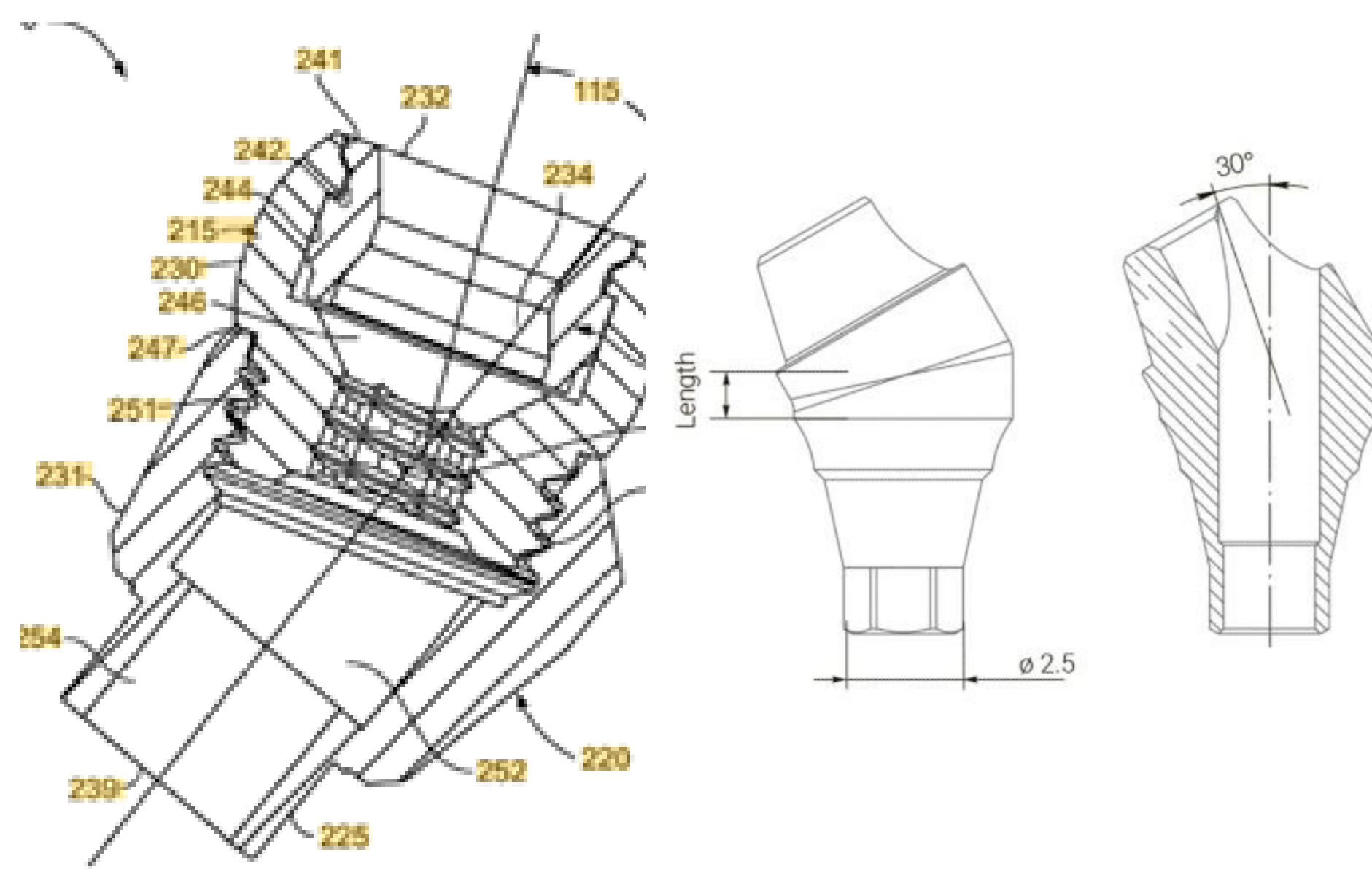


Fig 1: Conventional Multi-unit abutment System.

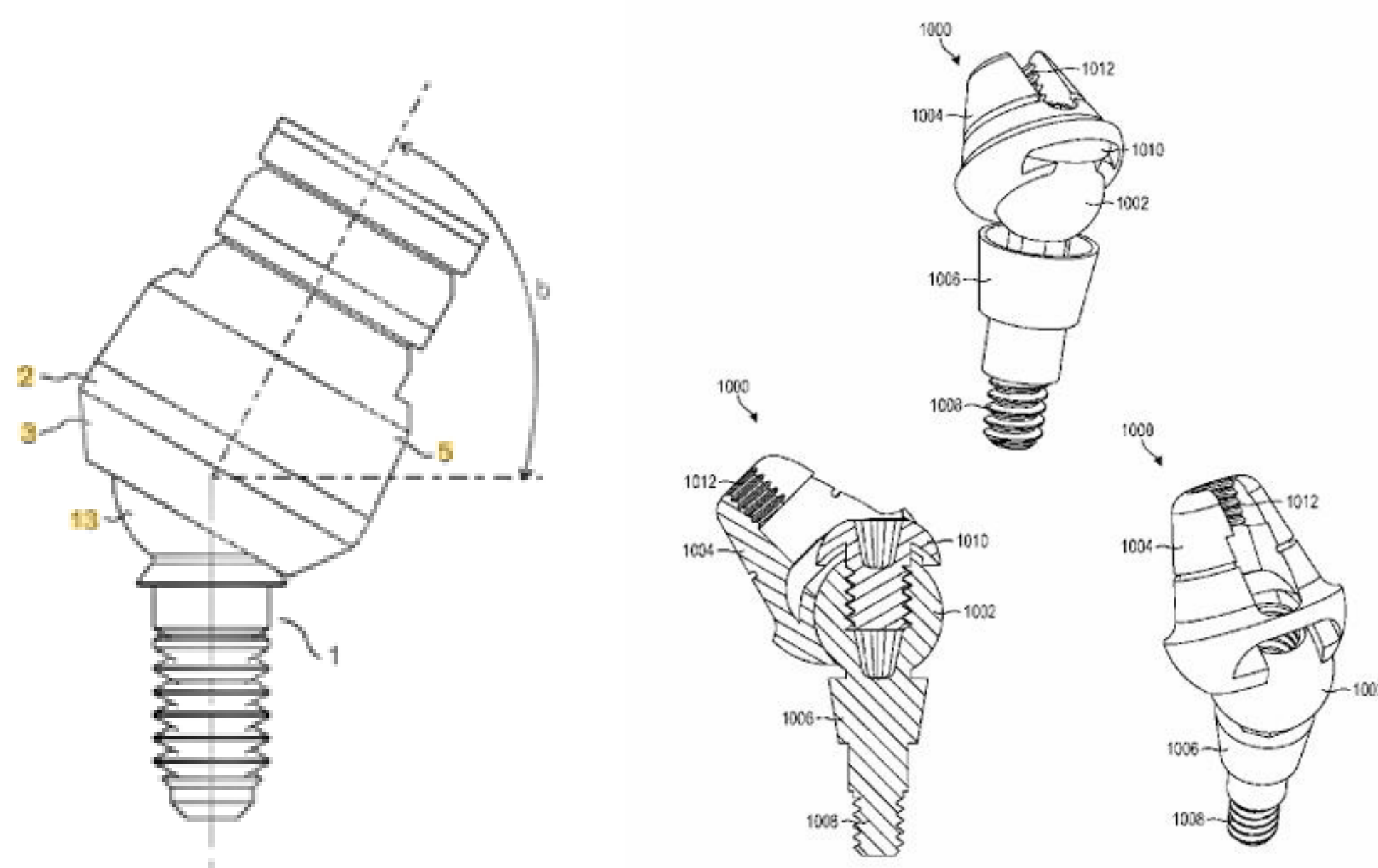


Fig 3: Omni-Directional Multi-Unit Abutment System.



Fig 5: Conventional abutment with 1,2 hex for final torque.

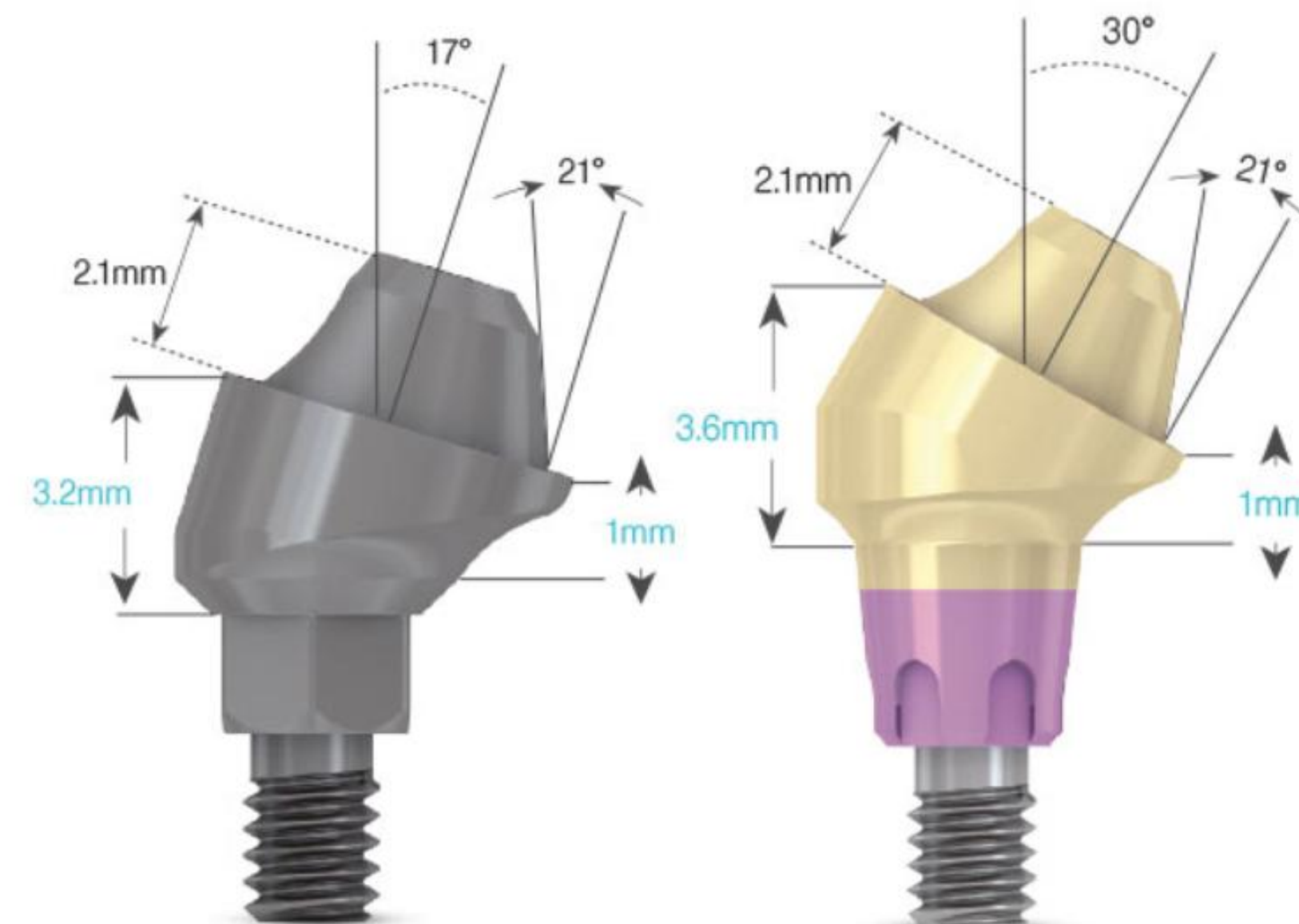


Fig 2: Conventional Multi-unit abutment angulations.

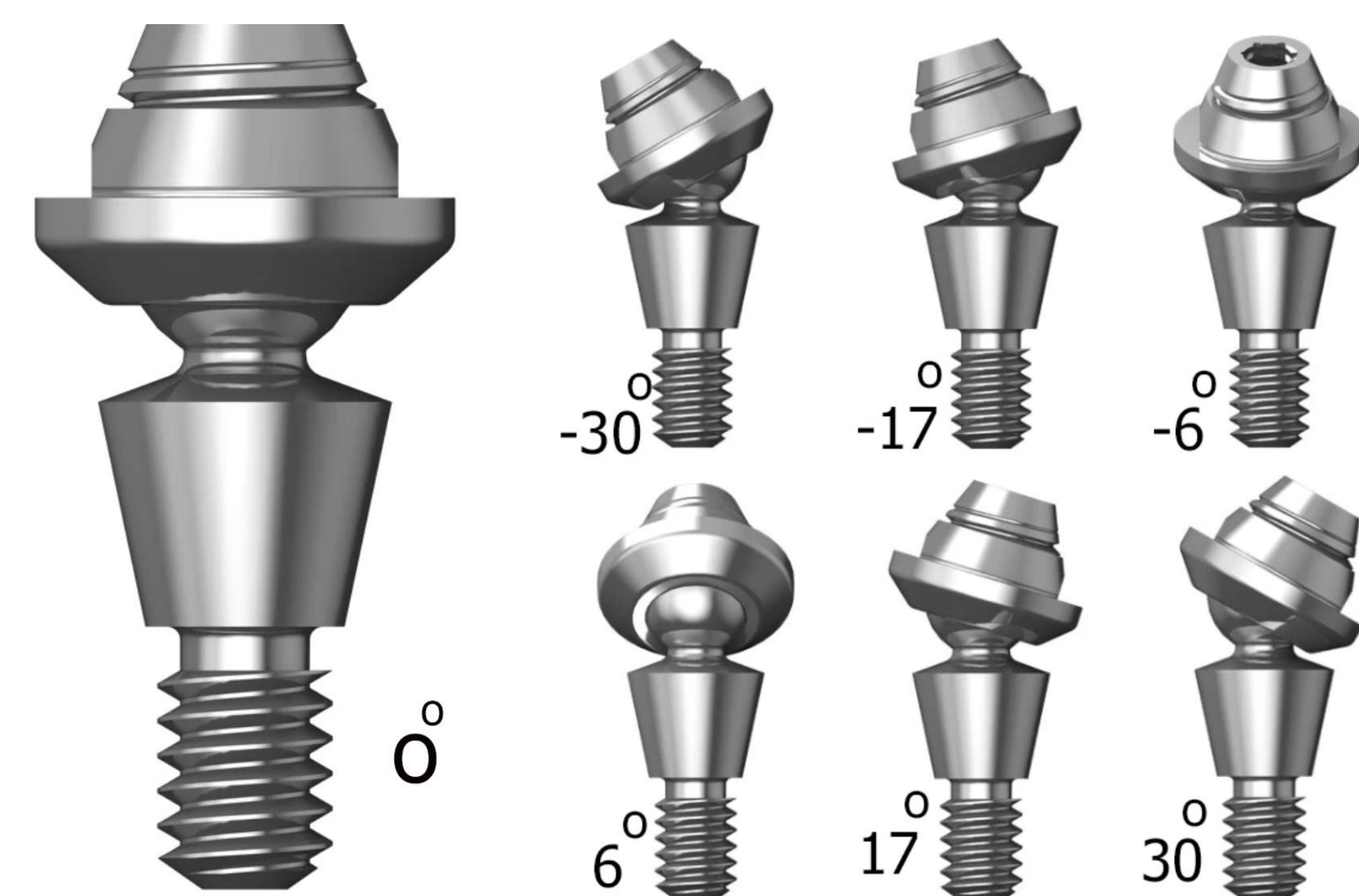


Fig 4: Omni-Directional Multi-Unit Abutment angulations.

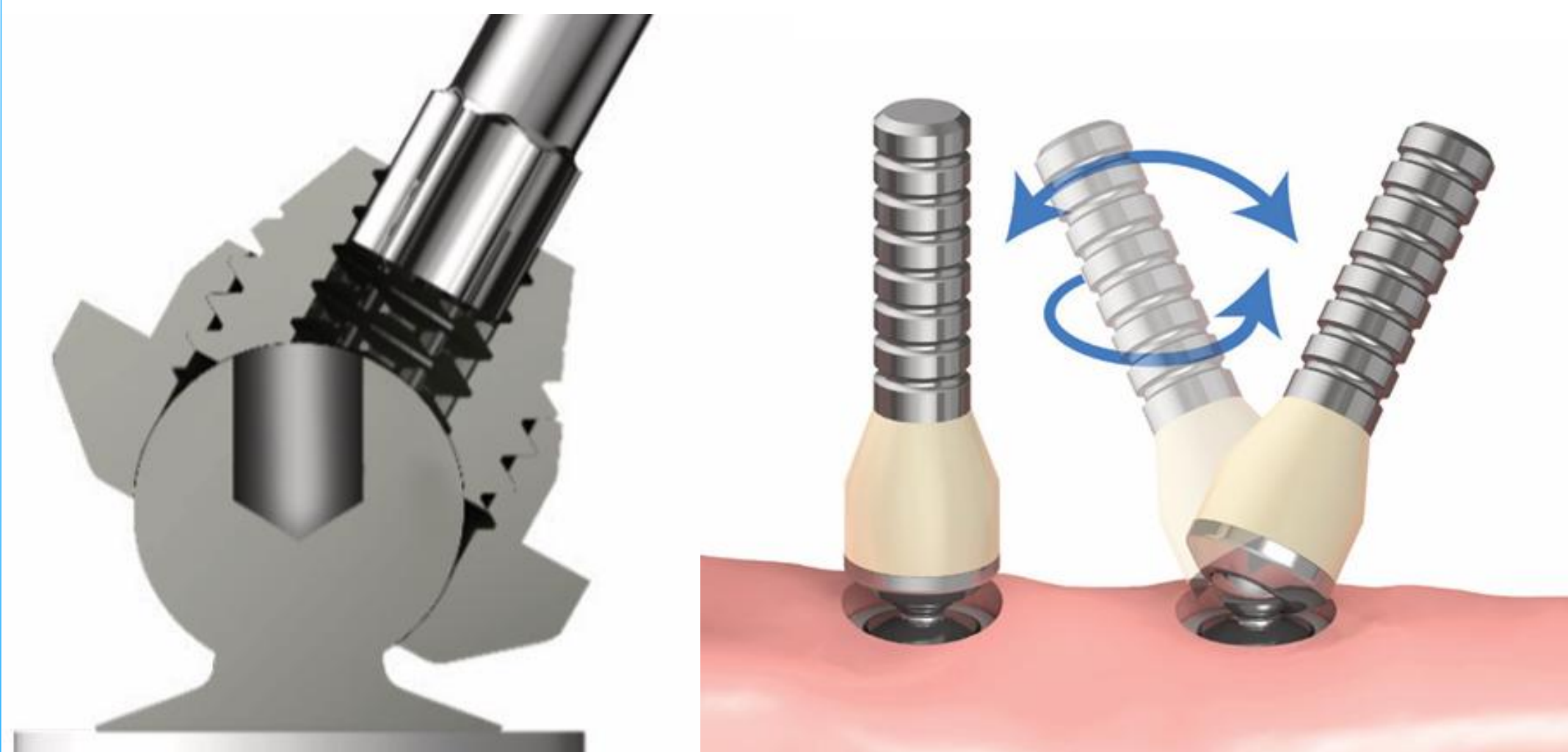


Fig 6: T6 driver into the abutment to angle swivel the desired location and orientation post to verify the angulation.

Results

- Conventional multi-unit abutments provide a single-piece gold standard design with fixed angulations (0° , 15° – 17° , 30°); greater angulation increases stress concentration in implant components and cortical bone, while requiring multiple abutment selections and complex clinical procedures.
- Adjustable multi-unit abutments (Omnibut™) employ a two-component design permitting continuous correction up to 30° , demonstrate ISO 14801 fatigue equivalence, provide stable retention, reduce abutment selection demands. However, clinical outcome evidence remains limited.

Discussion

- Adjustable abutments enable clinical adjustment, support real-time correction and broaden application in compromised bone, divergent implant placement, and full-arch rehabilitation. However, clinical performance and possible complications remain uncertain.
- The need for a proprietary prosthetic screw for the final prosthesis may increase prosthesis cost compared to a standard prosthetic screw for conventional MUA's.

Conclusion

- Conventional MUAs provide predictable outcomes but are constrained by fixed angulations and inventory demands.
- Integration of adjustable MUAs into clinical practice may improve implant rehabilitation outcomes by uniting biomechanical reliability with prosthodontic versatility.
- Future research should further explore the adjustable-angle MUA's clinical outcome.

References

