

Center for Oral & Facial Enhancement



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Small Diameter Implants

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An Overview of Applications and Evidence of Effectiveness of 1.8–2.4 mm Implants

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The general rationale for development of small diameter implants was the simplicity for insertion, cost effectiveness, and clinically effectiveness. The market share has increased greatly from \$14 million in 2005 to over \$55 million in 2010. They are mainly purchased and placed by general dentists who are the main target market and very small number of specialists. They have been sold to over 18000 dentist globally.



Currently these implants are **FDA approved only as a transitional** for mandibular denture stabilization. Off-label use has been utilized by some clinicians but there are no data or evidence-based support for their use and are not considered standard of care. This has resulted in legal implications.

Implant Characteristics:

- **Design features:** O-ball or square prosthetic head, tapered tip straight wall body, inserted by cortical perforation, self advancing thread resulting in lateral compression, 1.8 mm – 2.4 mm diameter
- **Surface** may be smooth or grit blasted, but they can be easily removed as they are not integrated
- **Prosthetic components** are basically various O-ring housing
- **Insertion protocol:** cortical perforation, inserted with hand instrument, immediately loaded

Alternate uses (off-label):

- **Maxillary denture retention-** No data on effectiveness, bone quality and implant stability are issues- very high failure rate
- **Single tooth restorations-** No data- high failure rates
- **Bail-out situations-** in narrow ridge- No data- high failure rates



Maxillary implants have high failure rates and do not provide aesthetic results

Frequent complications:

- **Poor angulation and spacing-** path of insertion issues, hygiene problems, soft tissue problems
- **Breakage of implant-** 55–60 Ncm to failure, fracture at the neck of the implant most common, often left in place
- **Loss of fixture-** very common- High failure especially if mandible bone height is less than 12 mm
- **FOM hematoma** due to poor angulation and perforation through lingual plate



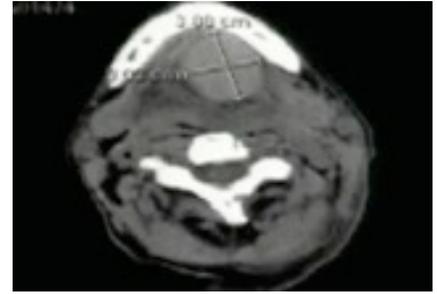
Poorly positioned



Fractures at neck



Loss of implants in short mandibles



Hematoma in FOM

Disadvantages:

- Not expandable to allow for a more sophisticated prosthesis
- Not applicable for small mandibles
- Failure rate higher than conventional implants

Are they effective?

- No good studies on long term success
- High failures in short mandibles
- Literature review: Very little and poor (Most are less than 6 month observations)

Conclusion:

Small diameter implants have very limited clinical use and currently are only approved as a transitional for mandibular dentures. The claims by companies who have basically targeted the general dentists, are not supported in well designed studies and there are no dependable evidence-based data in the literature. They have high rates of failure and are very limited in their clinical use and do not provide patients results they expect. The companies do not seem to support such studies and have not been collaborating with the scientific community.

(this information was presented at the AAOMS Dental Implant conference In December, 2009)