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SHORT IMPLANTS IN POSTERIOR JAWS– A LITERATURE REVIEW

Prosthodontics

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ABSTRACT

One of the greatest challenges that dentists face today is to rehabilitate severe atrophied alveolar ridges in partially and completely edentulous patients with implants. Loss of bone volume at the level of the posterior maxilla and mandible can complicate rehabilitation with implants, since it leads to a reduction in the distance to the maxillary sinus and the inferior alveolar nerve, respectively. Various techniques have been used for many years to avoid damaging these structures, such as alveolar ridge augmentation procedures, bone grafting, tooth nerve transposition, or even zygomatic implants. An alternative to these surgical treatments is the use of short implants in areas where bone availability is reduced.

KEYWORDS

short implants, short dental implants, short dental implants maxilla, short dental implants mandible

INTRODUCTION

Short implants are an increasingly common alternative to other surgical techniques in areas where bone availability is reduced. Various biomechanical studies propose that maximum bone stress is practically independent of implant length and implant width is more significant than the additional length. The introduction of short implants use in oral implantology was initially debatable because the tendency was to think that the longer implants will always show better clinical results due to better anchorage to bone and better distribution of occlusal load. Short implants are implants below 7 mm in length. They can be a very effective alternative to sinus grafting (with subsequent placement of longer implants).

This review evaluates the use of short implants and their clinical outcomes and the survival rates.

MATERIAL AND METHODS - SEARCH STRATEGY AND STUDYSELECTION

- In order to analyze all relevant literature for clinical studies of short dental implants a literature search was performed, using a systematic approach, for the time period of 2010 to till date. Within the pubmed search engine, the following key word strings was utilized:
- "Short implant AND dental implant OR short dental implants OR short dental implants posterior OR short dental implants maxilla OR short dental implants mandible"

Inclusion Criteria

1) Implant placement in posterior jaws.
2) Studies that test the short implants in clinical trials and RCT.
3) Studies written during the time period of 2010 to till date.

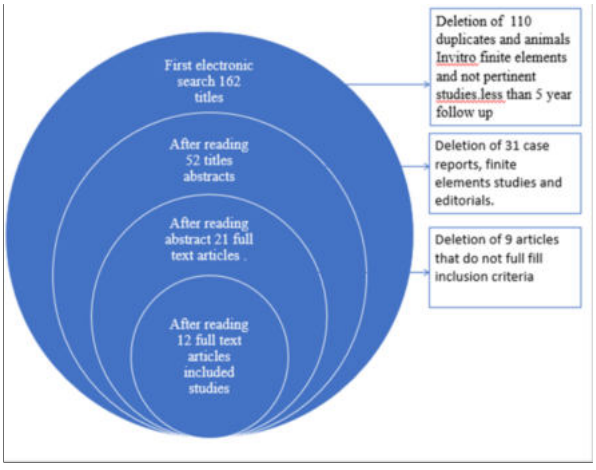
Exclusion Criteria

1) Nonclinical, animal, finite element studies and case reports.
2) Articles published in other than English language.
3) Retrospective studies,
4) Computer simulations
5) Studies that considered short implants larger than 8 mm

RESULTS

Nisand And Renouard Have Suggested Guidelines For Short Implants- For Residual Ridges Of At Least 5 mm In Width.

• In the **maxilla**, a minimum height of **6 mm below the maxillary sinus floor** is required for the use of short implants.
• If the available bone is **within 5 mm to 6 mm**, risk factors such as bone quality, history of periodontal disease, smoking habits, and the patients' age need to be considered before deciding whether short dental implants should be placed or whether augmentation is required.
• If **less than 5 mm of bone** is available, sinus floor elevation is necessary. In the **mandible,** the implant must remain 2 mm above the inferior alveolar canal as a safety zone.
• Therefore, a minimum height of 8 mm or more above the inferior alveolar canal is essential for placing short implants.
• If **less than 8 mm of bone** is available, advanced surgical techniques are necessary before placing the implants.



CUMULATIVE SHORT IMPLANT SURVIVAL RATE

Author,Year	Survival rate
Felice P et al 2014	95% of survival rate-years
Slotte C et al 2015	5-year implant survival rate of 71 out of 77 (92.2%)
Guljé FL, et al,2021	5-years implant survival rate of 96.0% and 98.9% for the 6-mm.
Roshdy MA et al 2019	The 5-year follow-up results showed 100% implant and prosthesis survival with no evidence of biological and mechanical complications
Thoma DS et al 2018	On the implant level, survival rates were 98.5%
Guljé FL et al,2019	94.7% in the 6-mm group (one implant loss), at the end of the 5 year evaluation
Naenni N et al,2018	a survival rate of 91% for 6-mm implants after 5 years
Nedir R et al ,2017	The overall implant success rate was 94.1%
Shi, J.Y et al,2015	high survival rates can be achieved after 5–10years for Straumann SLA Standard Plus short implants (6 or 8 mm) in the posterior region, without severe marginal bone loss and complications

- **Esposito et al**, observed that Surgeons often preferred to use short implants with wider bodies to compensate for the lack of implant height. They suggested short implants with diameters of 4 to 5 mm perform well at least up to 5 years post loading.
- **Pistilli et al**, concluded that short implants could be a more desirable treatment option than bone augmentation because of reduced treatment time, costs, and morbidity as there is significantly more complications seen in the augmented sites with longer implants than with the short implants
- Splinting short implants is more favorable for reducing stress, and it allows the stress to be shared between the implants.
- This factor should be considered for future clinical studies on mainly the posterior jaws as it can undermine the success of short implants if the implants are not splinted.

CONCLUSION

Based on this review of the literature, the following conclusions were drawn:

1. Short dental implants (6 mm to 8 mm) can be used successfully to support single or multiple fixed reconstructions or overdentures in atrophic maxillae and mandibles.
2. The use of short dental implants reduces the need for advanced and complicated surgical bone augmentation procedures, which reduces complications, costs, treatment time, and morbidity.
3. Further studies are needed to assess how short implants compare with longer implants in rehabilitating maxillofacial defects caused by congenital abnormalities, tumor resections, or trauma.

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