

Short implants

Implant placement in the posterior regions sometime faces anatomical challenges with limited vertical bone leading to proximity to the inferior alveolar nerve or with limited bone height as a result from expansion of the maxillary sinus. Additionally, implants placed in posterior regions are generally exposed to greater loads than when placed anteriorly. To allow for implant placement in situations like these Dentsply Sirona Implants has developed short implants for the Astra Tech Implant System, OsseoSpeed, 6 mm*, and for the Ankylos implant system, Ankylos 6.6 mm, which were launched in 2008 and 2013 respectively.

Historically, clinical studies have reported on lower survival rates for short implants (≤ 10 mm). However, these studies describe implants with machined surfaces, mostly placed in posterior regions with higher loads and softer bone compared with more anterior regions¹⁻¹¹. More recent clinical studies on short implants with rougher surfaces report clinical outcomes similar to implants in general¹².

Results from clinical studies show high survival rates (96 to 100%) for the 6 mm OsseoSpeed implant in all¹³⁻²⁵ but one study²⁶. Additionally, well maintained marginal bone levels with up to 2 years of follow-up have also been demonstrated^{14-18, 20, 23, 25}. In fact prospective, randomized, controlled clinical studies comparing OsseoSpeed implants with a length of 6 mm to that of 11 mm long implants in the posterior region indicated that treatment with short implants have equally good results on survival rate and maintenance of marginal bone levels compared to standard length implants^{14, 15, 21, 23, 25}. More favorable results for 6 mm implants compared with 11 mm OsseoSpeed implants regarding short term patient morbidity from surgical interventions, treatment time and cost have also been described²¹. Additionally high patient satisfaction scores have been reported for patients treated with 6 mm OsseoSpeed implants^{15-17, 20}.

Clinical studies on Ankylos 6.6 mm implants are currently ongoing.

* Immediate loading is not indicated in single tooth situations on implants shorter than 8 mm or in soft bone (type IV) where implant stability may be difficult to obtain and immediate loading may not be appropriate.

References

1. Friberg B, Jemt T, Lekholm U. Early failures in 4,641 consecutively placed branemark dental implants: A study from stage 1 surgery to the connection of completed prostheses. *Int J Oral Maxillofac Implants* 1991;6(2):142-6.
2. Bahat O. Treatment planning and placement of implants in the posterior maxillae: Report of 732 consecutive nobelpharma implants. *Int J Oral Maxillofac Implants* 1993;8(2):151-61.
3. Bahat O. Branemark system implants in the posterior maxilla: Clinical study of 660 implants followed for 5 to 12 years. *Int J Oral Maxillofac Implants* 2000;15(5):646-53.
4. Jemt T, Lekholm U. Implant treatment in edentulous maxillae: A 5-year follow-up report on patients with different degrees of jaw resorption. *Int J Oral Maxillofac Implants* 1995;10(3):303-11.
5. Naert I, Koutsikakis G, Duyck J, et al. Biologic outcome of implant-supported restorations in the treatment of partial edentulism. Part i: A longitudinal clinical evaluation. *Clin Oral Implants Res* 2002;13(4):381-9.
6. Weng D, Jacobson Z, Tarnow D, et al. A prospective multicenter clinical trial of 3i machined-surface implants: Results after 6 years of follow-up. *Int J Oral Maxillofac Implants* 2003;18(3):417-23.
7. Jaffin RA, Berman CL. The excessive loss of branemark fixtures in type iv bone: A 5-year analysis. *J Periodontol* 1991;62(1):2-4.
8. Tawil G, Younan R. Clinical evaluation of short, machined-surface implants followed for 12 to 92 months. *Int J Oral Maxillofac Implants* 2003;18(6):894-901.
9. Friberg B, Grondahl K, Lekholm U, et al. Long-term follow-up of severely atrophic edentulous mandibles reconstructed with short branemark implants. *Clin Implant Dent Relat Res* 2000;2(4):184-9.
10. das Neves FD, Fones D, Bernardes SR, et al. Short implants--an analysis of longitudinal studies. *Int J Oral Maxillofac Implants* 2006;21(1):86-93.
11. Renouard F, Nisand D. Impact of implant length and diameter on survival rates. *Clin Oral Implants Res* 2006;17 Suppl 2:35-51.
12. Thoma DS, Zeltner M, Husler J, et al. Eao supplement working group 4 - eao cc 2015 short implants versus sinus lifting with longer implants to restore the posterior maxilla: A systematic review. *Clin Oral Implants Res* 2015.
13. Gates WD, 3rd, Cooper LF, Sanders AE, et al. The effect of implant-supported removable partial dentures on oral health quality of life. *Clin Oral Implants Res* 2014;25(2):207-13.
14. Gulje F, Abrahamsson I, Chen S, et al. Implants of 6 mm vs. 11 mm lengths in the posterior maxilla and mandible: A 1-year multicenter randomized controlled trial. *Clin Oral Implants Res* 2013;24(12):1325-31.
15. Gulje FL, Raghoebar GM, Vissink A, et al. Single crowns in the resorbed posterior maxilla supported by either 6-mm implants or by 11-mm implants combined with sinus floor elevation surgery: A 1-year randomised controlled trial. *Eur J Oral Implantol* 2014;7(3):247-55.
16. Gulje F, Raghoebar GM, Ter Meulen JW, et al. Mandibular overdentures supported by 6-mm dental implants: A 1-year prospective cohort study. *Clin Implant Dent Relat Res* 2011;14(Supplement 1):e59-e66.
17. Gulje FL, Raghoebar GM, Vissink A, et al. Single restorations in the resorbed posterior mandible supported by 6-mm implants: A 1-year prospective case series study. *Clin Implant Dent Relat Res* 2015;17 Suppl 2:e465-71.
18. Han J, Zhang X, Tang Z, et al. A prospective, multicenter study assessing the Dentsply Sirona, osseospeed tx, length 6 mm in the posterior maxilla and mandible: A 1-year follow-up study. *Clin Oral Implants Res* 2015;E-pub Apr 9, doi: 10.1111/clr.12587.
19. Le BT, Follmar T, Borzabadi-Farahani A. Assessment of short dental implants restored with single-unit nonsplinted restorations. *Implant Dent* 2013;22(5):499-502.
20. Pieri F, Aldini NN, Fini M, et al. Preliminary 2-year report on treatment outcomes for 6-mm-long implants in posterior atrophic mandibles. *Int J Prosthodont* 2012;25(3):279-89.
21. Thoma DS, Haas R, Tutak M, et al. Randomized controlled multicentre study comparing short dental implants (6 mm) versus longer dental implants (11-15 mm) in combination with sinus floor elevation procedures. Part 1: Demographics and patient-reported outcomes at 1 year of loading. *J Clin Periodontol* 2015;42(1):72-80.
22. Parpaiola A, Norton MR, Cecchinato D, et al. Virtual abutment design: A concept for delivery of cad/cam customized abutments-report of a retrospective cohort. *Int J Periodontics Restorative Dent* 2013;33(1):51-8.
23. Thoma DS, Taylor TD, Garcia A, et al. Poster presented at the 3rd Astra Tech World Congress 2012; May 9-12, Gothenburg 2012.
24. Malmstrom H, Gupta B, Ghanem A, et al. Success rate of short dental implants supporting single crowns and fixed bridges. *Clin Oral Implants Res* 2015;E-pub Sep 22, doi:10.1111/clr.12693.
25. Schincaglia GP, Thoma DS, Haas R, et al. Randomized controlled multicenter study comparing short dental implants (6mm) versus longer dental implants (11-15 mm) in combination with sinus floor elevation procedures. Part 2: Clinical and radiographic outcomes at 1 year of loading. *J Clin Periodontol* 2015;E-pub Oct 1, doi:10.1111/jcpe.12465.
26. Kennedy KS, Jones EM, Kim DG, et al. A prospective clinical study to evaluate early success of short implants. *Int J Oral Maxillofac Implants* 2013;28(1):170-7.

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