

Astra Tech Implant System® – Clinical documentation*

Well documented, consistently reliable and safe

- More than 10,000 patients followed prospectively up to 20 years*
- >98% implant survival rate at 5 years of follow-up
- ~0.3 mm bone level reduction at 5 years of follow-up

Four implant design features behind the clinical success

Since 1991, Astra Tech Implant System is based on 4 key features**:

- OsseoSpeed surface, a moderately rough implant surface with 10 years of documented clinical follow-up
- Conical Seal Design, a conical implant-abutment connection
- MicroThread, minute threads on the implant neck
- Soft Tissue Chamber (formerly Connective Contour), a three-dimensional chamber created between the horizontal offset of the implant and the outer design of the abutment

The portfolio of implant designs range from short (6 mm)¹⁻²³, narrow (\varnothing 3.0 mm)²⁴⁻³⁰ and sloped implant neck contour (Profile)³¹⁻³⁴ to OsseoSpeed EV³⁵⁻⁴² all being well documented in the scientific community.

	< 5 years	5-9 years	\geq 10 years
Single tooth	6, 8, 11, 12, 14, 16, 23, 24, 27, 28, 31, 37, 38, 43-70	18, 22, 71-74	75, 76
Fixed prosthesis	1, 4, 13, 15, 17, 20, 35, 39, 77-93, 94	21, 95-101	102-111
Overdenture	5, 112-119	120-122	123, 124
Esthetic focus	29, 33, 34, 44, 125-138	129, 139, 140	
Surgical focus	7, 29, 36, 42, 84, 141-162	23, 159, 163-169	
Peri-implantitis focus	170-172	173	174, 175, 176
Patients evaluation	2, 19, 40, 41, 177-189, 190	191	

Astra Tech Implant System literature sorted per primary indication and scientific focus, and length of prospective follow-up period.

Conclusion

Extensive literature shows safe, consistent and predictable results for Astra Tech Implant System in terms of high implant survival rate and well maintained marginal bone¹⁹².

* This Scientific Review on Astra Tech Implant System only cites articles based on prospective studies where \geq 5 patients have been followed for \geq 1 year with OsseoSpeed implants or \geq 5 patients have been followed for $>$ 5 year with TiOblast implants

** For literature on the specific key features of Astra Tech Implant System, please see www.dentsplysirona.com/implants/science

References

1. Clelland, N, Chaudhry, J, Rashid, RG, et al., Split-mouth comparison of splinted and nonsplinted prostheses on short implants: 3-year results. *Int J Oral Maxillofac Implants* 2016;31(5):1135-41. [Abstract](#)
2. 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. [Abstract](#)
3. Guida, L, Annunziata, M, Esposito, U, et al., 6-mm-short and 11-mm-long implants compared in the full-arch rehabilitation of the edentulous mandible: A 3-year multicenter randomized controlled trial. *Clin Oral Implants Res* 2020;31(1):64-73. [Abstract](#)
4. Guljé, 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. [Abstract](#)
5. Guljé, F, Raghoobar, 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* 2012;14 Suppl 1(Supplement 1):e59-66. [Abstract](#)
6. Guljé, FL, Raghoobar, GM, Erkens, WA, et al., Impact of crown-implant ratio of single restorations supported by 6-mm implants: A short-term case series study. *Int J Oral Maxillofac Implants* 2016;31(3):672-5. [Abstract](#)
7. Guljé, FL, Raghoobar, 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. [Abstract](#)
8. Guljé, FL, Raghoobar, 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. [Abstract](#)
9. Guljé, FL, Raghoobar, GM, Vissink, A, et al., Single crown restorations supported by 6-mm implants in the resorbed posterior mandible: A five-year prospective case series. *Clin Implant Dent Relat Res* 2019;21(5):1017-22. [Abstract](#)
10. Hadzik, J, Krawiec, M, Kubasiewicz-Ross, P, et al., Short implants and conventional implants in the residual maxillary alveolar ridge: A 36-month follow-up observation. *Med Sci Monit* 2018;24:5645-52. [Abstract](#)
11. Hadzik, J, Krawiec, M, Slawecki, K, et al., The influence of the crown-implant ratio on the crestal bone level and implant secondary stability: 36-month clinical study. *Biomed Res Int* 2018;2018:4246874. [Abstract](#)
12. Han, J, Tang, Z, Zhang, X, et al., A prospective, multi-center study assessing early loading with short implants in posterior regions. A 3-year post-loading follow-up study. *Clin Implant Dent Relat Res* 2018;20(1):34-42. [Abstract](#)
13. Han, J, Zhang, X, Tang, Z, et al., A prospective, multicenter study assessing the DENTSPLY Implants, Osseospeed TX, length 6 mm in the posterior maxilla and mandible: a 1-year follow-up study. *Clin Oral Implants Res* 2016;27(4):452-7. [Abstract](#)
14. Malmstrom, H, Gupta, B, Ghanem, A, et al., Success rate of short dental implants supporting single crowns and fixed bridges. *Clin Oral Implants Res* 2016;27(9):1093-8. [Abstract](#)
15. 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. [Abstract](#)
16. Schincaglia, GP, Thoma, DS, Haas, R, et al., Randomized controlled multicenter study comparing short dental implants (6 mm) 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;42(11):1042-51. [Abstract](#)
17. Tabrizi, R, Arabion, H, Aliabadi, E, et al., Does increasing the number of short implants reduce marginal bone loss in the posterior mandible? A prospective study. *Br J Oral Maxillofac Surg* 2016;54(7):731-5. [Abstract](#)
18. Thoma, DS, Haas, R, Sporniak-Tutak, K, 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: 5-Year data. *J Clin Periodontol* 2018;45(12):1465-74. [Abstract](#)
19. 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. [Abstract](#)
20. Zadeh, HH, Gulje, F, Palmer, PJ, et al., Marginal bone level and survival of short and standard-length implants after 3 years: An Open Multi-Center Randomized Controlled Clinical Trial. *Clin Oral Implants Res* 2018;29(8):894-906. [Abstract](#)
21. Gulje, FL, Meijer, HJA, Abrahamsson, I, et al., Comparison of 6-mm and 11-mm dental implants in the posterior region supporting fixed dental prostheses: 5-year results of an open multicenter randomized controlled trial. *Clin Oral Implants Res* 2021;32(1):15-22. [Abstract](#)
22. Gulje, FL, Raghoobar, GM, Vissink, A, et al., Single crowns in the resorbed posterior maxilla supported by either 11-mm implants combined with sinus floor elevation or 6-mm implants: A 5-year randomised controlled trial. *Int J Oral Implantol* 2019;12(3):315-26. [Abstract](#)
23. Hadzik, J, Kubasiewicz-Ross, P, Nawrot-Hadzik, I, et al., Short (6 mm) and regular dental implants in the posterior maxilla-7 years follow-up study. *J Clin Med* 2021;10(5):940. [Abstract](#)
24. Galindo-Moreno, P, Nilsson, P, King, P, et al., Clinical and radiographic evaluation of early loaded narrow diameter implants - 1-year follow-up. *Clin Oral Implants Res* 2012;23(5):609-16. [Abstract](#)
25. Galindo-Moreno, P, Nilsson, P, King, P, et al., Clinical and radiographic evaluation of early loaded narrow-diameter implants: 5-year follow-up of a multicenter prospective clinical study. *Clin Oral Implants Res* 2017;28(12):1584-91. [Abstract](#)
26. Galindo-Moreno, P, Padial-Molina, M, Nilsson, P, et al., The influence of the distance between narrow implants and the adjacent teeth on marginal bone levels. *Clin Oral Implants Res* 2017;28(6):704-12. [Abstract](#)
27. King, P, Maiorana, C, Luthardt, RG, et al., Clinical and radiographic evaluation of a small-diameter dental implant used for the restoration of patients with permanent tooth agenesis (hypodontia) in the maxillary lateral incisor and mandibular incisor regions: a 36-month follow-up. *Int J Prosthodont* 2016;29(2):147-53. [Abstract](#)
28. Maiorana, C, King, P, Quaas, S, et al., Clinical and radiographic evaluation of early loaded narrow-diameter implants: 3 years follow-up. *Clin Oral Implants Res* 2015;26(1):77-82. [Abstract](#)
29. Pieri, F, Siroli, L, Forlivesi, C, et al., Clinical, esthetic, and radiographic evaluation of small-diameter (3.0-mm) implants supporting single crowns in the anterior region: a 3-year prospective study. *Int J Periodontics Restorative Dent* 2014;34(6):825-32. [Abstract](#)
30. Knobloch, LA, Larsen, P, McGlumphy, E, et al., Prospective cohort study to evaluate narrow diameter implants for restoration of a missing lateral incisor in patients with a cleft palate: One-year results. *J Prosthet Dent* 2021;E-pub May 27 doi:10.1016/j.jprostdent.2021.03.030. [Abstract](#)
31. Lee, PK, Siu, AS, A two-year evaluation of a sloped marginal contour implant system placed in healed sites. *Int J Oral Maxillofac Implants* 2016;31(6):1423-28. [Abstract](#)
32. Noelken, R, Donati, M, Fiorellini, J, et al., Soft and hard tissue alterations around implants placed in an alveolar ridge with a sloped configuration. *Clin Oral Implants Res* 2014;25(1):3-9. [Abstract](#)
33. Noelken, R, Oberhansl, F, Kunkel, M, et al., Immediately provisionalized Osseospeed() Profile implants inserted into extraction sockets: 3-year results. *Clin Oral Implants Res* 2016;27(6):744-9. [Abstract](#)
34. Schiegnitz, E, Noelken, R, Moergel, M, et al., Survival and tissue maintenance of an implant with a sloped configurated shoulder in the posterior mandible-a prospective multicenter study. *Clin Oral Implants Res* 2017;28(6):721-26. [Abstract](#)
35. Borges, T, Leitao, B, Pereira, M, et al., Influence of the abutment height and connection timing in early peri-implant marginal bone changes: A prospective randomized clinical trial. *Clin Oral Implants Res* 2018;29(9):907-14. [Abstract](#)
36. Levin, BP, Chu, SJ, Changes in peri-implant soft tissue thickness with bone grafting and Dermis Allograft: A case series of 15 consecutive patients. *Int J Periodontics Restorative Dent* 2018;38(5):719-27. [Abstract](#)
37. Norton, MR, The influence of low insertion torque on primary stability, implant survival, and maintenance of marginal bone levels: A closed-cohort prospective study. *Int J Oral Maxillofac Implants* 2017;32(4):849-57. [Abstract](#)

38. Stanford, CM, Barwacz, C, Raes, S, et al., Multicenter clinical randomized controlled trial evaluation of an implant system designed for enhanced primary stability. *Int J Oral Maxillofac Implants* 2016;31(4):906-15. [Abstract](#)
39. Toia, M, Stocchero, M, Becktor, JP, et al., Implant vs abutment level connection in implant supported screw-retained fixed partial dentures with cobalt-chrome framework: 1-year interim results of a randomized clinical study. *Clin Implant Dent Relat Res* 2019;21(2):238-46. [Abstract](#)
40. Toia, M, Wennerberg, A, Torrisi, P, et al., Patient satisfaction and clinical outcomes in implant-supported overdentures retained by milled bars: Two-year follow-up. *J Oral Rehabil* 2019;46(7):624-33. [Abstract](#)
41. Barbier, L, Pottel, L, De Ceulaer, J, et al., Evaluation of quality of life after mandibular reconstruction using a novel fixed implant-supported dental prosthesis concept: A pilot study. *Int J Prosthodont* 2019;32(2):162-73. [Abstract](#)
42. Younes, F, Cosyn, J, De Bruyckere, T, et al., A 2-year prospective case series on volumetric changes, PROMs, and clinical outcomes following sinus floor elevation using deproteinized bovine bone mineral as filling material. *Clin Implant Dent Relat Res* 2019;21(2):301-09. [Abstract](#)
43. Barewal, RM, Stanford, C, Weesner, TC, A randomized controlled clinical trial comparing the effects of three loading protocols on dental implant stability. *Int J Oral Maxillofac Implants* 2012;27(4):945-56. [Abstract](#)
44. Noelken, R, Neffe, BA, Kunkel, M, et al., Maintenance of marginal bone support and soft tissue esthetics at immediately provisionalized Osseospeed implants placed into extraction sites: 2-year results. *Clin Oral Implants Res* 2014;25(2):214-20. [Abstract](#)
45. Barwacz, CA, Stanford, CM, Diehl, UA, et al., Pink esthetic score outcomes around three implant-abutment configurations: 3-year results. *Int J Oral Maxillofac Implants* 2018;33(5):1126-35. [Abstract](#)
46. Basler, T, Naenni, N, Schneider, D, et al., Randomized controlled clinical study assessing two membranes for guided bone regeneration of peri-implant bone defects: 3-year results. *Clin Oral Implants Res* 2018;29(5):499-507. [Abstract](#)
47. Berberi, AN, Noujeim, ZN, Kanj, WH, et al., Immediate placement and loading of maxillary single-tooth implants: a 3-year prospective study of marginal bone level. *J Contemp Dent Pract* 2014;15(2):202-8. [Abstract](#)
48. Cooper, LF, Reside, G, Stanford, C, et al., Three-year prospective randomized comparative assessment of anterior maxillary single implants with different abutment interfaces. *Int J Oral Maxillofac Implants* 2019;34(1):150-58. [Abstract](#)
49. Eisner, B, Naenni, N, Husler, J, et al., Three-year results of a randomized controlled clinical trial using submucosally veneered and unveneered zirconia abutments supporting all-ceramic single-implant crowns. *Int J Periodontics Restorative Dent* 2018;38(5):645-52. [Abstract](#)
50. Ferrari, M, Cagidiaco, MC, Garcia-Godoy, F, et al., Effect of different prosthetic abutments on peri-implant soft tissue. A randomized controlled clinical trial. *Am J Dent* 2015;28(2):85-9. [Abstract](#)
51. Ferrari, M, Tricarico, MG, Cagidiaco, MC, et al., 3-year randomized controlled prospective clinical trial on different CAD-CAM implant abutments. *Clin Implant Dent Relat Res* 2016;18(6):1134-41. [Abstract](#)
52. Ghozeizi, R, Alikhasi, M, Siadat, M-R, et al., A radiographic comparison of progressive and conventional loading on crestal bone loss and dentistry in single dental implants: A randomized controlled trial study. *J Dent (Tehran)* 2013;10(2):155-63. [Abstract](#)
53. Guncu, MB, Cakan, U, Aktas, G, et al., Comparison of implant versus tooth-supported zirconia-based single crowns in a split-mouth design: a 4-year clinical follow-up study. *Clin Oral Investig* 2016;20(9):2467-73. [Abstract](#)
54. Hosseini, M, Worsaae, N, Schiodt, M, et al., A 1-year randomised controlled trial comparing zirconia versus metal-ceramic implant supported single-tooth restorations. *Eur J Oral Implantol* 2011;4(4):347-61. [Abstract](#)
55. Hosseini, M, Worsaae, N, Schiodt, M, et al., A 3-year prospective study of implant-supported, single-tooth restorations of all-ceramic and metal-ceramic materials in patients with tooth agenesis. *Clin Oral Implants Res* 2013;24(10):1078-87. [Abstract](#)
56. Koutouzis, T, Neiva, R, Lipton, D, et al., The effect of interimplant distance on peri-implant bone and soft tissue dimensional changes: a nonrandomized, prospective, 2-year follow-up study. *Int J Oral Maxillofac Implants* 2015;30(4):900-8. [Abstract](#)
57. Kutan, E, Bolukbasi, N, Yildirim-Ondur, E, et al., Clinical and radiographic evaluation of marginal bone changes around platform-switching implants placed in crestal or subcrestal positions: A randomized controlled clinical trial. *Clin Implant Dent Relat Res* 2015;17 Suppl 2:e364-75. [Abstract](#)
58. Lee, DW, Lee, DW, Park, KH, et al., The effects of off-axial loading on perimplant marginal bone loss in a single implant. *J Prosthet Dent* 2014;112(3):501-7. [Abstract](#)
59. Lops, D, Mosca, D, Muller, A, et al., Management of peri-implant soft tissues between tooth and adjacent immediate implant placed into fresh extraction single socket: a one-year prospective study on two different types of implant-abutment connection design. *Minerva Stomatol* 2011;60(9):403-15. [Abstract](#)
60. Marcelis, K, Vercruyssen, M, Naert, I, et al., Model-based guided implant insertion for solitary tooth replacement: a pilot study. *Clin Oral Implants Res* 2012;23(8):999-1003. [Abstract](#)
61. Palmer, RM, Howe, LC, Palmer, PJ, et al., A prospective clinical trial of single Astra Tech 4.0 or 5.0 diameter implants used to support two-unit cantilever bridges: results after 3 years. *Clin Oral Implants Res* 2012;23(1):35-40. [Abstract](#)
62. Sanz, M, Cecchinato, D, Ferrus, J, et al., Implants placed in fresh extraction sockets in the maxilla: clinical and radiographic outcomes from a 3-year follow-up examination. *Clin Oral Implants Res* 2014;25(3):321-7. [Abstract](#)
63. Schepke, U, Lohrbauer, U, Meijer, HJ, et al., Adhesive failure of Lava Ultimate and lithium disilicate crowns bonded to zirconia abutments: A prospective within-patient comparison. *Int J Prosthodont* 2018;31(3):208-10. [Abstract](#)
64. Schepke, U, Meijer, HJ, Vermeulen, KM, et al., Clinical bonding of resin nano ceramic restorations to zirconia abutments: A case series within a randomized clinical trial. *Clin Implant Dent Relat Res* 2016;18(5):984-92. [Abstract](#)
65. Simmons, DE, Maney, P, Teitelbaum, AG, et al., Comparative evaluation of the stability of two different dental implant designs and surgical protocols-a pilot study. *Int J Implant Dent* 2017;3(1):16. [Abstract](#)
66. Tabrizi, R, Pourdanesh, F, Zare, S, et al., Do angulated implants increase the amount of bone loss around implants in the anterior maxilla? *J Oral Maxillofac Surg* 2013;71(2):272-7. [Abstract](#)
67. Thoma, DS, Brandenberg, F, Fehmer, V, et al., Randomized controlled clinical trial of all-ceramic single tooth implant reconstructions using modified zirconia abutments: Radiographic and prosthetic results at 1 year of loading. *Clin Implant Dent Relat Res* 2016;18(3):462-72. [Abstract](#)
68. Thoma, DS, Sailer, I, Muhlemann, S, et al., Randomized controlled clinical study of veneered zirconia abutments for single implant crowns: Clinical, histological, and microbiological outcomes. *Clin Implant Dent Relat Res* 2018;20(6):988-96. [Abstract](#)
69. Vera, C, De Kok, IJ, Chen, W, et al., Evaluation of post-implant buccal bone resorption using cone beam computed tomography: a clinical pilot study. *Int J Oral Maxillofac Implants* 2012;27(5):1249-57. [Abstract](#)
70. Rossi, AL, Palombo, D, Clivio, A, et al., Three year randomized split mouth clinical trial comparing marginal bone loss around implants with a conical or straight collar design. *Global Journal of Oral Science* 2020;6:16-24.
71. Berberi, AN, Sabbagh, JM, Abousheilib, MN, et al., A 5-year comparison of marginal bone level following immediate loading of single-tooth implants placed in healed alveolar ridges and extraction sockets in the maxilla. *Front Physiol* 2014;5:29. [Abstract](#)
72. Lops, D, Bressan, E, Chiapasco, M, et al., Zirconia and titanium implant abutments for single-tooth implant prostheses after 5 years of function in posterior regions. *Int J Oral Maxillofac Implants* 2013;28(1):281-7. [Abstract](#)
73. Veltri, M, Ekestubbe, A, Abrahamsson, I, et al., Three-Dimensional buccal bone anatomy and aesthetic outcome of single dental implants replacing maxillary incisors. *Clin Oral Implants Res* 2016;27(8):956-63. [Abstract](#)
74. Naenni, N, Stucki, L, Husler, J, et al., Implants sites with concomitant bone regeneration using a resorbable or non-resorbable membrane result in stable marginal bone levels and similar profilometric outcomes over 5 years. *Clin Oral Implants Res* 2021;E-pub May 13 doi:10.1111/cir.13764. [Abstract](#)
75. Raes, S, Cosyn, J, Noyelle, A, et al., Clinical outcome after 8 to 10 years of immediately restored single implants placed in extraction sockets and healed ridges. *Int J Periodontics Restorative Dent* 2018;38(3):337-45. [Abstract](#)
76. Raes, S, Eghbali, A, Chappuis, V, et al., A long-term prospective cohort study on immediately restored single tooth implants inserted in extraction sockets and healed ridges: CBCT analyses, soft tissue alterations, aesthetic ratings, and patient-reported outcomes. *Clin Implant Dent Relat Res* 2018;20(4):522-30. [Abstract](#)

77. Arora, H, Khzam, N, Roberts, D, et al., Immediate implant placement and restoration in the anterior maxilla: Tissue dimensional changes after 2-5 year follow up. *Clin Implant Dent Relat Res* 2017;19(4):694-702. [Abstract](#)
78. Balleri, P, Ferrari, M, Veltri, M, One-year outcome of implants strategically placed in the retrocanine bone triangle. *Clin Implant Dent Relat Res* 2010;12(4):324-30. [Abstract](#)
79. Barbier, L, Abeloos, J, De Clercq, C, et al., Peri-implant bone changes following tooth extraction, immediate placement and loading of implants in the edentulous maxilla. *Clin Oral Investig* 2012;16(4):1061-70. [Abstract](#)
80. Bernard, L, Vercruyssen, M, Duyck, J, et al., A randomized controlled clinical trial comparing guided with nonguided implant placement: A 3-year follow-up of implant-centered outcomes. *J Prosthet Dent* 2019;121(6):904-10. [Abstract](#)
81. Collaert, B, Wijnen, L, De Bruyn, H, A 2-year prospective study on immediate loading with fluoride-modified implants in the edentulous mandible. *Clin Oral Implants Res* 2011;22(10):1111-6. [Abstract](#)
82. D'haese, J, Vervaeke, S, Verbanck, N, et al., Clinical and radiographic outcome of implants placed using stereolithographic guided surgery: a prospective monocenter study. *Int J Oral Maxillofac Implants* 2013;28(1):205-15. [Abstract](#)
83. Ebler, S, Ioannidis, A, Jung, RE, et al., Prospective randomized controlled clinical study comparing two types of two-piece dental implants supporting fixed reconstructions - results at 1 year of loading. *Clin Oral Implants Res* 2016;27(9):1169-77. [Abstract](#)
84. Esquivel-Upshaw, J, Mehler, A, Clark, A, et al., Peri-implant complications for posterior endosteal implants. *Clin Oral Implants Res* 2015;26(12):1390-6. [Abstract](#)
85. Esquivel-Upshaw, JF, Clark, AE, Shuster, JJ, et al., Randomized clinical trial of implant-supported ceramic-ceramic and metal-ceramic fixed dental prostheses: preliminary results. *J Prosthodont* 2014;23(2):73-82. [Abstract](#)
86. Kim, JJ, Lee, DW, Kim, CK, et al., Effect of conical configuration of fixture on the maintenance of marginal bone level: preliminary results at 1 year of function. *Clin Oral Implants Res* 2010;21(4):439-44. [Abstract](#)
87. Lajie, A, Ozkan, YK, Ozkan, Y, et al., Stability and marginal bone loss with three types of early loaded implants during the first year after loading. *Int J Oral Maxillofac Implants* 2012;27(1):162-72. [Abstract](#)
88. Stanford, CM, Wagner, W, Rodriguez, YBR, et al., Evaluation of the effectiveness of dental implant therapy in a practice-based network (FOCUS). *Int J Oral Maxillofac Implants* 2010;25(2):367-73. [Abstract](#)
89. Temmerman, A, Rasmusson, L, Kubler, A, et al., An open, prospective, non-randomized, controlled, multicentre study to evaluate the clinical outcome of implant treatment in women over 60 years of age with osteoporosis/osteopenia: 1-year results. *Clin Oral Implants Res* 2017;28(1):95-102. [Abstract](#)
90. Vervaeke, S, Collaert, B, De Bruyn, H, The effect of implant surface modifications on survival and bone loss of immediately loaded implants in the edentulous mandible. *Int J Oral Maxillofac Implants* 2013;28(5):1352-7. [Abstract](#)
91. Zhou, J, Huang, Q, Wang, X, et al., Early loading of splinted implants in the posterior mandible: a prospective multicentre case series. *J Clin Periodontol* 2016;43(3):298-304. [Abstract](#)
92. Ivanoff, CJ, Lindhe, J, Ellner, S, et al., An open, randomised, multi-centre study, comparing straight and tapered apex implants design, in partially and totally edentulous maxillae. *Acta Odontol Scand* 2021;E-pub Mar 5 doi:10.1080/00016357.2021.1894352:1-7. [Abstract](#)
93. Toia, M, Stocchero, M, Corra, E, et al., Fixed full-arch maxillary prostheses supported by four versus six implants with a titanium CAD/CAM milled framework: 3-year multicentre RCT. *Clin Oral Implants Res* 2021;32(1):44-59. [Abstract](#)
94. Esquivel-Upshaw, JF, Mehler, A, Clark, AE, et al., Fracture analysis of randomized implant-supported fixed dental prostheses. *J Dent* 2014;42(10):1335-42. [Abstract](#)
95. Mertens, C, Steveling, HG, Implant-supported fixed prostheses in the edentulous maxilla: 8-year prospective results. *Clin Oral Implants Res* 2010;22(5):464-72. [Abstract](#)
96. Mertens, C, Steveling, HG, Early and immediate loading of titanium implants with fluoride-modified surfaces: results of 5-year prospective study. *Clin Oral Implants Res* 2011;22(12):1354-60. [Abstract](#)
97. Noelken, R, Moergel, M, Kunkel, M, et al., Immediate and flapless implant insertion and provisionalization using autogenous bone grafts in the esthetic zone: 5-year results. *Clin Oral Implants Res* 2018;29(3):320-27. [Abstract](#)
98. Schliephake, H, Rodiger, M, Phillips, K, et al., Early loading of surface modified implants in the posterior mandible - 5 year results of an open prospective non-controlled study. *J Clin Periodontol* 2012;39 (2):188-95. [Abstract](#)
99. Toljanic, JA, Ekstrand, K, Baer, RA, et al., Immediate loading of implants in the edentulous maxilla with a fixed provisional restoration without bone augmentation: A report on 5-year outcomes data obtained from a prospective clinical trial. *Int J Oral Maxillofac Implants* 2016;31(5):1164-70. [Abstract](#)
100. Vervaeke, S, Collaert, B, Cosyn, J, et al., A 9-year prospective case series using multivariate analyses to identify predictors of early and late peri-implant bone loss. *Clin Implant Dent Relat Res* 2016;18(1):30-9. [Abstract](#)
101. Esquivel-Upshaw, JF, Mecholsky, JJ, Jr., Clark, AE, et al., Factors influencing the survival of implant-supported ceramic-ceramic prostheses: A randomized, controlled clinical trial. *J Dent* 2020;103S:100017. [Abstract](#)
102. Cecchinato, D, Parpaila, A, Lindhe, J, Mucosal inflammation and incidence of crestal bone loss among implant patients: a 10-year study. *Clin Oral Implants Res* 2014;25(7):791-6. [Abstract](#)
103. Donati, M, Ekestubbe, A, Lindhe, J, et al., Marginal bone loss at implants with different surface characteristics - A 20-year follow-up of a randomized controlled clinical trial. *Clin Oral Implants Res* 2018;29(5):480-87. [Abstract](#)
104. Jacobs, R, Pittayapat, P, van Steenberghe, D, et al., A split-mouth comparative study up to 16 years of two screw-shaped titanium implant systems. *J Clin Periodontol* 2010;37(12):119-127. [Abstract](#)
105. Mertens, C, Meyer-Baumer, A, Kappel, H, et al., Use of 8-mm and 9-mm implants in atrophic alveolar ridges: 10-year results. *Int J Oral Maxillofac Implants* 2012;27(6):1501-8. [Abstract](#)
106. Mertens, C, Steveling, HG, Stucke, K, et al., Fixed implant-retained rehabilitation of the edentulous maxilla: 11-year results of a prospective study. *Clin Implant Dent Relat Res* 2012;14(6):816-27. [Abstract](#)
107. Rasmusson, L, Roos, J, Bystedt, H, A 10-year follow-up study of titanium dioxide-blasted implants. *Clin Implant Dent Relat Res* 2005;7(1):36-42. [Abstract](#)
108. Raval, N, Dahlgren, S, Teiwik, A, et al., Long-term evaluation of Astra Tech and Branemark implants in patients treated with full-arch bridges. Results after 12-15 years. *Clin Oral Implants Res* 2013;24(10):1144-51. [Abstract](#)
109. Trbakovic, A, Toljanic, JA, Kumar, VV, et al., Eight to eleven-year follow-up of immediately loaded implants placed in edentulous maxillae with compromised bone volume and poor bone quality: A prospective cohort study. *Clin Implant Dent Relat Res* 2020;22(1):69-76. [Abstract](#)
110. Van Assche, N, Pittayapat, P, Jacobs, R, et al., Microbiological outcome of two screw-shaped titanium implant systems placed following a split-mouth randomised protocol, at the 12th year of follow-up after loading. *Eur J Oral Implantol* 2011;4(2):103-16. [Abstract](#)
111. Windael, S, Vervaeke, S, Wijnen, L, et al., Ten-year follow-up of dental implants used for immediate loading in the edentulous mandible: A prospective clinical study. *Clin Implant Dent Relat Res* 2018;20(4):515-21. [Abstract](#)
112. Bressan, E, Tomasi, C, Stellini, E, et al., Implant-supported mandibular overdentures: a cross-sectional study. *Clin Oral Implants Res* 2012;23(7):814-9. [Abstract](#)
113. Gökçen-Röhlík, B, Meric, U, Keskin, H, Clinical and radiographic outcomes of implants immediately placed in fresh extraction sockets. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2010;109(4):1-7. [Abstract](#)
114. Mumcu, E, Bilhan, H, Geckili, O, The influence of healing type on marginal bone levels of implants supporting mandibular overdentures: A randomized clinical study. *Indian J Dent Res* 2012;23(4):514-8. [Abstract](#)
115. Roe, P, Kan, JY, Rungcharassaeng, K, et al., Immediate loading of unsplinted implants in the anterior mandible for overdentures: 3-year results. *Int J Oral Maxillofac Implants* 2011;26(6):1296-302. [Abstract](#)
116. Schincaglia, GP, Rubin, S, Thacker, S, et al., Marginal bone response around immediate- and delayed-loading implants supporting a locator-retained mandibular overdenture: a randomized controlled study. *Int J Oral Maxillofac Implants* 2016;31(2):448-58. [Abstract](#)
117. Slot, W, Raghoebar, GM, Vissink, A, et al., Maxillary overdentures supported by four or six implants in the anterior region; 1-year results from a randomized controlled trial. *J Clin Periodontol* 2013;40(3):303-10. [Abstract](#)
118. Slot, W, Raghoebar, GM, Vissink, A, et al., Maxillary overdentures supported by anteriorly or posteriorly placed implants opposed by a natural dentition in the mandible: a 1-year prospective case series study. *Clin Implant Dent Relat Res* 2014;16(1):51-61. [Abstract](#)

119. Ettl, T, Junold, N, Zeman, F, et al., Implant survival or implant success? Evaluation of implant-based prosthetic rehabilitation in head and neck cancer patients-a prospective observational study. *Clin Oral Investig* 2020;24(9):3039-47. [Abstract](#)
120. Boven, GC, Meijer, HJ, Slot, W, et al., Does a large dehiscent implant surface at placement affect the 5-year treatment outcome? An assessment of implants placed to support a maxillary overdenture. *J Craniomaxillofac Surg* 2015;43(9):1758-62. [Abstract](#)
121. Boven, GC, Slot, JWA, Raghoobar, GM, et al., Maxillary implant-supported overdentures opposed by (partial) natural dentitions: a 5-year prospective case series study. *J Oral Rehabil* 2017;44(12):988-95. [Abstract](#)
122. Slot, W, Raghoobar, GM, Cune, MS, et al., Maxillary overdentures supported by four or six implants in the anterior region: 5-year results from a randomized controlled trial. *J Clin Periodontol* 2016;43(12):1180-87. [Abstract](#)
123. Lehmann, KM, Kammerer, PW, Karbach, J, et al., Long-term effect of overdenture bar design on peri-implant tissues. *Int J Oral Maxillofac Implants* 2013;28(4):126-31. [Abstract](#)
124. Vroom, MG, Sipos, P, de Lange, GL, et al., Effect of surface topography of screw-shaped titanium implants in humans on clinical and radiographic parameters: a 12-year prospective study. *Clin Oral Implants Res* 2009;20(11):1231-39. [Abstract](#)
125. Arora, H, Ivanovski, S, Correlation between pre-operative buccal bone thickness and soft tissue changes around immediately placed and restored implants in the maxillary anterior region: A 2-year prospective study. *Clin Oral Implants Res* 2017;28(10):1188-94. [Abstract](#)
126. Barwacz, CA, Stanford, CM, Diehl, UA, et al., Electronic assessment of peri-implant mucosal esthetics around three implant-abutment configurations: a randomized clinical trial. *Clin Oral Implants Res* 2016;27(6):707-15. [Abstract](#)
127. Borges, T, Lima, T, Carvalho, A, et al., The influence of customized abutments and custom metal abutments on the presence of the interproximal papilla at implants inserted in single-unit gaps: a 1-year prospective clinical study. *Clin Oral Implants Res* 2014;25(11):1222-7. [Abstract](#)
128. Cecchinato, D, Lops, D, Salvi, GE, et al., A prospective, randomized, controlled study using Osseospeed implants placed in maxillary fresh extraction socket: soft tissues response. *Clin Oral Implants Res* 2015;26(1):20-7. [Abstract](#)
129. Cooper, LF, Reside, G, Raes, F, et al., Immediate provisionalization of dental implants in grafted alveolar ridges in the esthetic zone: a 5-year evaluation. *Int J Periodontics Restorative Dent* 2014;34(4):477-86. [Abstract](#)
130. Cooper, LF, Reside, G, Stanford, C, et al., A multicenter randomized comparative trial of implants with different abutment interfaces to replace anterior maxillary single teeth. *Int J Oral Maxillofac Implants* 2015;30(3):622-32. [Abstract](#)
131. Kraus, RD, Epprecht, A, Hammerle, CHF, et al., Cemented vs screw-retained zirconia-based single implant reconstructions: A 3-year prospective randomized controlled clinical trial. *Clin Implant Dent Relat Res* 2019;21(4):578-85. [Abstract](#)
132. Levin, BP, Wilk, BL, Immediate provisionalization of immediate implants in the esthetic zone: a prospective case series evaluating implant survival, esthetics, and bone maintenance. *Compend Contin Educ Dent* 2013;34(5):352-61. [Abstract](#)
133. Lops, D, Bressan, E, Parpaila, A, et al., Soft tissues stability of cad-cam and stock abutments in anterior regions: 2-year prospective multicentric cohort study. *Clin Oral Implants Res* 2015;26(12):1436-42. [Abstract](#)
134. Lops, D, Chiapasco, M, Rossi, A, et al., Incidence of inter-proximal papilla between a tooth and an adjacent immediate implant placed into a fresh extraction socket: 1-year prospective study. *Clin Oral Implants Res* 2008;19(11):1135-40. [Abstract](#)
135. Lops, D, Parpaila, A, Paniz, G, et al., Interproximal papilla stability around CAD/CAM and stock abutments in anterior regions: A 2-year prospective multicenter cohort study. *Int J Periodontics Restorative Dent* 2017;37(5):657-65. [Abstract](#)
136. Raes, F, Cosyn, J, Crommelinck, E, et al., Immediate and conventional single implant treatment in the anterior maxilla: 1-year results of a case series on hard and soft tissue response and aesthetics. *J Clin Periodontol* 2011;38(4):385-94. [Abstract](#)
137. Raes, S, Rocci, A, Raes, F, et al., A prospective cohort study on the impact of smoking on soft tissue alterations around single implants. *Clin Oral Implants Res* 2015;26(9):1086-90. [Abstract](#)
138. Tsuda, H, Rungcharassaeng, K, Kan, JY, et al., Peri-implant tissue response following connective tissue and bone grafting in conjunction with immediate single-tooth replacement in the esthetic zone: A case series. *Int J Oral Maxillofac Implants* 2011;26(2):427-36. [Abstract](#)
139. Hosseini, M, Worsaae, N, Gotfredsen, K, Tissue changes at implant sites in the anterior maxilla with and without connective tissue grafting: A five-year prospective study. *Clin Oral Implants Res* 2020;31(1):18-28. [Abstract](#)
140. Laass, A, Sailer, I, Husler, J, et al., Randomized controlled clinical trial of all-ceramic single-tooth implant reconstructions using modified zirconia abutments: Results at 5 years after loading. *Int J Periodontics Restorative Dent* 2019;39(1):17-27. [Abstract](#)
141. Bashutski, JD, Wang, HL, Rudek, I, et al., Effect of flapless surgery on single-tooth implants in the esthetic zone: a randomized clinical trial. *J Periodontol* 2013;84(12):1747-54. [Abstract](#)
142. Cooper, LF, Raes, F, Reside, GJ, et al., Comparison of radiographic and clinical outcomes following immediate provisionalization of single-tooth dental implants placed in healed alveolar ridges and extraction sockets. *Int J Oral Maxillofac Implants* 2010;25(6):1222-32. [Abstract](#)
143. De Bruyn, H, Raes, F, Cooper, LF, et al., Three-years clinical outcome of immediate provisionalization of single Osseospeed() implants in extraction sockets and healed ridges. *Clin Oral Implants Res* 2013;24(2):217-23. [Abstract](#)
144. Donati, M, La Scala, V, Billi, M, et al., Immediate functional loading of implants in single tooth replacement: a prospective clinical multicenter study. *Clin Oral Implants Res* 2008;19(8):740-48. [Abstract](#)
145. Kahnberg, KE, Wallstrom, M, Rasmusson, L, Local sinus lift for single-tooth implant. I: clinical and radiographic follow-up. *Clin Implant Dent Relat Res* 2011;13(3):231-7. [Abstract](#)
146. Koutouzis, T, Koutouzis, G, Tomasi, C, et al., Immediate loading of implants placed with the osteotome technique: One-year prospective case series. *J Periodontol* 2011;82(11):1556-62. [Abstract](#)
147. Liu, J, Huang, Q, Wang, X, et al., Early loading of splinted implants in posterior mandible: three-year results of a prospective multicenter study. *Clin Oral Implants Res* 2019;30(10):1049-58. [Abstract](#)
148. Lyngstadaas, SP, Verket, A, Pinholt, EM, et al., Titanium granules for augmentation of the maxillary sinus - a multicenter study. *Clin Implant Dent Relat Res* 2015;17 Suppl 2:e594-600. [Abstract](#)
149. Merheb, J, Vercruyssen, M, Coucke, W, et al., The fate of buccal bone around dental implants. A 12-month postloading follow-up study. *Clin Oral Implants Res* 2017;28(1):103-08. [Abstract](#)
150. Mertens, C, Steveling, HG, Seeberger, R, et al., Reconstruction of severely atrophied alveolar ridges with calvarial onlay bone grafts and dental implants. *Clin Implant Dent Relat Res* 2013;15(5):673-83. [Abstract](#)
151. Mordenfeld, A, Aludden, H, Starch-Jensen, T, Lateral ridge augmentation with two different ratios of deproteinized bovine bone and autogenous bone: A 2-year follow-up of a randomized and controlled trial. *Clin Implant Dent Relat Res* 2017;19(5):884-94. [Abstract](#)
152. Oxby, G, Oxby, F, Oxby, J, et al., Early loading of fluoridated implants placed in fresh extraction sockets and healed bone: A 3- to 5-year clinical and radiographic follow-up study of 39 consecutive patients. *Clin Implant Dent Relat Res* 2015;17(5):898-907. [Abstract](#)
153. Piero, B, Mario, V, Niccolo, N, et al., Implant placement in combination with sinus membrane elevation without biomaterials: A 1-year study on 15 patients. *Clin Implant Dent Relat Res* 2012;14(5):682-9. [Abstract](#)
154. Pohl, V, Thoma, DS, Sporniak-Tutak, K, et al., Short dental implants (6 mm) versus long dental implants (11-15 mm) in combination with sinus floor elevation procedures: 3-year results from a multicentre, randomized, controlled clinical trial. *J Clin Periodontol* 2017;44(4):438-45. [Abstract](#)
155. Raes, F, Cosyn, J, De Bruyn, H, Clinical, aesthetic, and patient-related outcome of immediately loaded single implants in the anterior maxilla: A prospective study in extraction sockets, healed ridges, and grafted sites. *Clin Implant Dent Relat Res* 2013;15(6):819-35. [Abstract](#)
156. Raes, F, Renckens, L, Aps, J, et al., Reliability of circumferential bone level assessment around single implants in healed ridges and extraction sockets using cone beam CT. *Clin Implant Dent Relat Res* 2013;15(5):661-72. [Abstract](#)
157. Temmerman, A, Keestra, JA, Coucke, W, et al., The outcome of oral implants placed in bone with limited bucco-oral dimensions: a 3-year follow-up study. *J Clin Periodontol* 2015;42(3):311-8. [Abstract](#)
158. Thor, A, Ekstrand, K, Baer, RA, et al., Three-year follow-up of immediately loaded implants in the edentulous atrophic maxilla: A study in patients with poor bone quantity and quality. *Int J Oral Maxillofac Implants* 2014;29(3):642-9. [Abstract](#)

159. Toljanic, JA, Baer, RA, Ekstrand, K, et al., Implant rehabilitation of the atrophic edentulous maxilla including immediate fixed provisional restoration without the use of bone grafting: a review of 1-year outcome data from a long-term prospective clinical trial. *Int J Oral Maxillofac Implants* 2009;24(3):518-26. [Abstract](#)
160. Uribarri, A, Bilbao, E, Marichalar-Mendia, X, et al., Bone remodeling around implants placed in augmented sinuses in patients with and without history of periodontitis. *Clin Implant Dent Relat Res* 2017;19(2):268-79. [Abstract](#)
161. Vercruyssen, M, van de Wiele, G, Teughels, W, et al., Implant- and patient-centred outcomes of guided surgery, a 1-year follow-up: An RCT comparing guided surgery with conventional implant placement. *J Clin Periodontol* 2014;41(12):1154-60. [Abstract](#)
162. Yoon, WJ, Jeong, KI, You, JS, et al., Survival rate of Astra Tech implants with maxillary sinus lift. *J Korean Assoc Oral Maxillofac Surg* 2014;40(1):17-20. [Abstract](#)
163. Donati, M, La Scala, V, Di Raimondo, R, et al., Marginal bone preservation in single-tooth replacement: a 5-year prospective clinical multicenter study. *Clin Implant Dent Relat Res* 2015;17(3):425-34. [Abstract](#)
164. Ioannidis, A, Heierle, L, Hammerle, CHF, et al., Prospective randomized controlled clinical study comparing two types of two-piece dental implants supporting fixed reconstructions-Results at 5 years of loading. *Clin Oral Implants Res* 2019;30(11):1126-33. [Abstract](#)
165. Matthys, C, Vervaeke, S, Besseler, J, et al., Five-year study of mandibular overdentures on stud abutments: Clinical outcome, patient satisfaction and prosthetic maintenance-Influence of bone resorption and implant position. *Clin Oral Implants Res* 2019;30(9):940-51. [Abstract](#)
166. Salman, A, Thacker, S, Rubin, S, et al., Immediate versus delayed loading of mandibular implant-retained overdentures: A 60-month follow-up of a randomized clinical trial. *J Clin Periodontol* 2019;46(8):863-71. [Abstract](#)
167. Temmerman, A, Rasmussen, L, Kubler, A, et al., A prospective, controlled, multicenter study to evaluate the clinical outcome of implant treatment in women with osteoporosis/osteopenia: 5-year results. *J Dent Res* 2019;98(1):84-90. [Abstract](#)
168. Cooper, LF, Reside, GJ, Raes, F, et al., Immediate provisionalization of dental implants placed in healed alveolar ridges and extraction sockets: A 5-year prospective evaluation. *Int J Oral Maxillofac Implants* 2014;29(3):709-17. [Abstract](#)
169. Kahramanoglu, E, Aslan, YU, Ozkan, Y, et al., The clinical and radiologic outcomes of early loaded implants after 5 years of service. *Int J Oral Maxillofac Implants* 2020;35(6):1248-56. [Abstract](#)
170. Aguirre-Zorzano, LA, Vallejo-Aisa, FJ, Estefania-Fresco, R, Supportive periodontal therapy and periodontal biotype as prognostic factors in implants placed in patients with a history of periodontitis. *Med Oral Patol Oral Cir Bucal* 2013;18(5):e786-92. [Abstract](#)
171. Brandenberg, FD, Sailer, I, Fehmer, V, et al., Randomized controlled clinical pilot study of all-ceramic single-tooth implant reconstructions: clinical and microbiological outcomes at one year of loading. *Clin Oral Implants Res* 2017;28(4):406-13. [Abstract](#)
172. Carcuac, O, Derkx, J, Charalampakis, G, et al., Adjunctive systemic and local antimicrobial therapy in the surgical treatment of peri-implantitis: a randomized controlled clinical trial. *J Dent Res* 2016;95(1):50-7. [Abstract](#)
173. Doornewaard, R, Bruyn, H, Matthys, C, et al., The long-term effect of adapting the vertical position of implants on peri-implant health: A 5-year intra-subject comparison in the edentulous mandible including oral health-related quality of life. *J Clin Med* 2020;9(10). [Abstract](#)
174. Renvert, S, Lindahl, C, Persson, RG, The incidence of peri-implantitis for two different implant systems over a period of thirteen years. *J Clin Periodontol* 2012;39(12):1191-7. [Abstract](#)
175. Windael, S, Collaert, B, De Buyser, S, et al., Early peri-implant bone loss as a predictor for peri-implantitis: A 10-year prospective cohort study. *Clin Implant Dent Relat Res* 2021;E-pub Jun 3, doi: 10.1111/cid.13000. [Abstract](#)
176. Windael, S, Vervaeke, S, De Buyser, S, et al., The long-term effect of smoking on 10 years' survival and success of dental implants: A prospective analysis of 453 implants in a non-university setting. *J Clin Med* 2020;9(4). [Abstract](#)
177. Cakir, O, Kazancioglu, HO, Celik, G, et al., Evaluation of the efficacy of mandibular conventional and implant prostheses in a group of Turkish patients: a quality of life study. *J Prosthodont* 2014;23(5):390-6. [Abstract](#)
178. De Kok, I, Chang, K-H, Li, T-S, et al., Comparison of three-implant-supported fixed dentures and two-implant-retained overdentures in the edentulous mandible: A pilot study of treatment efficacy and patient satisfaction. *Int J Oral Maxillofac Implants* 2011;26(2):415-26. [Abstract](#)
179. Doornewaard, R, Glibert, M, Matthys, C, et al., Improvement of quality of life with implant-supported mandibular overdentures and the effect of implant type and surgical procedure on bone and soft tissue stability: A three-year prospective split-mouth trial. *J Clin Med* 2019;8(6). [Abstract](#)
180. Emami, E, Cerutti-Kopplin, D, Menassa, M, et al., Does immediate loading affect clinical and patient-centered outcomes of mandibular 2-unsplinted-implant overdenture? A 2-year within-case analysis. *J Dent* 2016;50:30-6. [Abstract](#)
181. Erkapers, M, Ekstrand, K, Baer, RA, et al., Patient satisfaction following dental implant treatment with immediate loading in the edentulous atrophic maxilla. *Int J Oral Maxillofac Implants* 2011;26(2):356-64. [Abstract](#)
182. Ettl, T, Weindler, J, Gosau, M, et al., Impact of radiotherapy on implant-based prosthetic rehabilitation in patients with head and neck cancer: A prospective observational study on implant survival and quality of life-preliminary results. *J Craniomaxillofac Surg* 2016;44(9):1453-62. [Abstract](#)
183. Limmer, B, Sanders, AE, Reside, G, et al., Complications and patient-centered outcomes with an implant-supported monolithic zirconia fixed dental prosthesis: 1 year results. *J Prosthodont* 2014;23(4):267-75. [Abstract](#)
184. Mertens, C, de San Jose Gonzalez, J, Freudlsperger, C, et al., Implant-prosthetic rehabilitation of hemimaxillectomy defects with CAD/CAM suprastructures. *J Craniomaxillofac Surg* 2016;44(11):1812-18. [Abstract](#)
185. Packer, M, Nikitin, V, Coward, T, et al., The potential benefits of dental implants on the oral health quality of life of people with Parkinson's disease. *Gerontology* 2009;26(1):11-8. [Abstract](#)
186. Raes, F, Cooper, LF, Tarrida, LG, et al., A case-control study assessing oral-health-related quality of life after immediately loaded single implants in healed alveolar ridges or extraction sockets. *Clin Oral Implants Res* 2012;23(5):602-8. [Abstract](#)
187. Rismanchian, M, Fazel, A, Rakhshan, V, et al., One-year clinical and radiographic assessment of fluoride-enhanced implants on immediate non-functional loading in posterior maxilla and mandible: a pilot prospective clinical series study. *Clin Oral Implants Res* 2011;22(12):1440-5. [Abstract](#)
188. Schepke, U, Meijer, HJ, Kerdijk, W, et al., Stock versus CAD/CAM customized zirconia implant abutments - clinical and patient-based outcomes in a randomized controlled clinical trial. *Clin Implant Dent Relat Res* 2017;19(1):74-84. [Abstract](#)
189. Van Lierde, KM, Corthals, P, Browaeys, H, et al., Impact of anterior single-tooth implants on quality of life, articulation and oromotorfunctional behaviour: a pilot study. *J Oral Rehabil* 2011;38(3):170-5. [Abstract](#)
190. Pieri, F, Aldini, NN, Fini, M, et al., Immediate fixed implant rehabilitation of the atrophic edentulous maxilla after bilateral sinus floor augmentation: a 12-month pilot study. *Clin Implant Dent Relat Res* 2012;14 (Suppl 1):e67-82. [Abstract](#)
191. Raes, S, Raes, F, Cooper, L, et al., Oral health-related quality of life changes after placement of immediately loaded single implants in healed alveolar ridges or extraction sockets: a 5-year prospective follow-up study. *Clin Oral Implants Res* 2017;28(6):662-67. [Abstract](#)
192. Norton, MR, Astrom, M, The influence of implant surface on maintenance of marginal bone levels for three premium implant brands: A systematic review and meta-analysis. *Int J Oral Maxillofac Implants* 2020;35(6):1099-111. [Abstract](#)

THE DENTAL
SOLUTIONS
COMPANY™

