

Table S1. Study characteristics.

Study	Study Design	No. of patients	Age (years)	No. of implants	Approach	F/U periods
Acocella et al. 2010	Prospective study	68 (37M 31F)	29.19±3.62	68	One-stage	3 years
Aguirre-Zorzano et al. 2011	Prospective clinical study	57 (19M 37F)	26-78	78 (56 after extraction and 22 in healed sockets)	One-stage	92 weeks
Andreasi Bassi et al. 2016	Prospective clinical study	52 (31M 21F)	54±11	52	One-stage	44.6±34.4 months
Arora et al. 2017	Prospective study	30 (9M 21F)	20-78	30	One-stage	2-5 years
Atieh et al. 2013	Controlled clinical trial	24 (IIP12, DIP12)	IIP 51.5±13.4 DIP 53.6±12.3	24 (IIP12, DIP12)	Two-stage	1 year
Baer et al. 2013	Prospective, multicenter study	84 (37M 47F)	53.23±12.6 7	115	One-stage	6 months to 3 years
Baer et al. 2013	Prospective study	84 (37M 47F)	53.23±2.67	115	One-stage	6 months to 3 years
Canullo et al. 2010	Randomized Clinical Trial	25	42-68	25	Two-stage	3 years
Carinci 2012	Retrospective cohort study	19 (9M 10 F)	65±11	36 Opi (Diamond; BIOIMPLANT, Milan, Italy)	One-stage	7 months
Cooper et al. 2014	Prospective study	113 (IIP55, DIP58)	IIP 45±14 DIP 42±15	113 (IIP55, DIP58)	Two-stage	5 years
Corvino et al. 2020	Randomized Clinical Trial	33 (17M 16F)	67.4±14.5	53 in the maxilla 15 in the mandible	Two-stage	6 months to 1 year
Cosyn et al. 2011	Prospective study	30 (14M 16F)	24-76	30	One-stage	3 years
Covani et al. 2012	Prospective Cohort Study	91 (36M 55F)	23-75	159	One-stage	10 years
Cucchi et al. 2017	Randomized Clinical Trial	92 (43M 49F)	51.0±9.5	97	Two-stage	3 years
Esposito et al. 2015	Randomized Clinical Trial	106 (46M 60F)	28-72	106	Two-stage	4 months to 12 months

Felice et al. 2015	Randomized Clinical Trial	50	ND	50	Two-stage	4 months to 12 months
Gamper et al. 2017	Randomized controlled clinical trial	60 (S1: 13 M17F; S2: 10M 20F)	S1 47.5±15 S2 55.8±14	151 one-piece (Straumann tissue-level implants, Institut Straumann, Basel, Switzerland; S1) or two-piece dental implants (Brånemark MkIII or MkIV, Nobel Biocare, Zurich, Switzerland; S2).	Two-stage	4-6 years
Guarnieri et al. 2015	Prospective study	21 (14M 7F)	22-40	21	One-stage	5 years
Mangano et al. 2013	Retrospective study	40	45-47	40	Two-stage	34.44±7.10 months
Meijer et al. 2019	Prospective study	40	18-66	40	One-stage	12 months
Meloni et al. 2020	Randomized controlled trial	18	ND	36	One-stage	12 years (3 months to 60 months)
Naeini et al. 2018	Prospective study	49	62±12.9	53 (TiUnite Brånemark implants)	One-stage	6-9 years (88 months)
Negri et al. 2014	Longitudinal analysis of a consecutive series (Controlled Clinical Trial)	252	54.4±0.7	632 (ZirTi surface, 3.3 to 5 mm diameter, and 8.5 to 13 mm length.)	Two-stage	36 months (3 years)
Oliver 2012	Controlled Clinical Trial	241 (108M 133F)	19-73	432 (Osstem GSII bone level implants)	One-stage	12 months
Raes et al. 2016	Randomized Clinical Trial	96 (41M 55F)	43±14.8	102	Two-stage	5 years
Raes et al. 2018	prospective study	IIP16 DIP23	IIP45 DIP40	IIP16 DIP23	Two-stage	96 months
Tonetti et al. 2017	Randomized Controlled Clinical Trial	124	55±13	124	Two-stage	1 year to 3 years
Zuiderveld et al. 2018	Randomized Clinical Trial	60 (28M32F)	19.5-82.2	60	One-stage	12 months

Table S2. Implant success rate.

Study	No. of implants	Approach	F/U periods	Success rate (%)
Andreasi Bassi et al. 2016	52	One-stage	44.6±34.4 months	77%
Baer et al. 2013	115	One-stage	6 months to 3 years	100%
Canullo et al. 2010	25	Two-stage	3 years	100%
Carinci 2012	36	One-stage	7 months	91.7%
Corvino et al. 2020	53 in the maxilla 15 in the mandible	Two-stage	6 months to 1 year	100%
Cosyn et al. 2011	30	One-stage	3 years	76%
Covani et al. 2012	159	One-stage	10 years	91.8% (87.9% in the non-GBR group and 94.1% in the GBR group)
Esposito et al. 2015	106	Two-stage	4 months to 12 months	100%
Mangano et al. 2013	40	Two-stage	34.44±7.10	100%
Meloni et al. 2020	36	One-stage	5 years	100%
Naeini et al. 2018	53	One-stage	6-9 years (88 months)	100%
Negri et al. 2014	632	Two-stage	36 months	100%
Oliver 2012	432	One-stage	12 months	100%
Tonetti et al. 2017	124	Two-stage	1 year to 3 years	100%
Zuiderveld et al. 2018	60	One-stage	12 months	96.7%

Table S3. Implant survival rate.

Study	No. of implants	Approach	F/U periods	Survival rate
Acocella et al. 2010	68	One-stage	3 years	97.96%
Aguirre-Zorzano et al. 2011	78	One-stage	92 weeks	98.7%
Andreasi Bassi et al. 2016	52	One-stage	44.6±34.4 months	100%
Arora et al. 2017	30	One-stage	2-5 years	100%
Atieh et al. 2013	24	Two-stage	1 year	IIP 66.7% DIP 83.3%
Baer et al. 2013	115	One-stage	6 months to 3 years	98.3%

Baer et al. 2013	115	One-stage	6 months to 3 years	98.3%
Canullo et al. 2010	25	Two-stage	3 years	100%
Carinci 2012	36	One-stage	7 months	97%
Cooper et al. 2014	113 (IIP55 DIP58)	Two-stage	5 years	IIP 94.5% DIP 98.3%
Corvino et al. 2020	53 in the maxilla 15 in the mandible	Two-stage	6 months to 1 year	100%
Cosyn et al. 2011	30	One-stage	3 years	96%
Covani et al. 2012	159	One-stage	10 years	91.8%
Cucchi et al. 2017	97	Two-stage	3 years	95.9% ~ 100%
Esposito et al. 2015	106	Two-stage	4 months to 12 months	100%
Felice et al. 2015	50	Two-stage	4 months to 12 months	100%
Gamper et al. 2017	151 one-piece (S1) or two-piece dental implants (S2)	One-stage	4-6 years	97.9% (S1: 96.6% S2: 98.9%) (P = 0.592).
Guarnieri et al. 2015	21	One-stage	5 years	95.2%
Mangano et al. 2013	40	Two-stage	34.44±7.10	100%
Meijer et al. 2019	40	One-stage	12 months	100%
Meloni et al. 2020	36	One-stage	5 years	100%
Naeini et al. 2018	53	One-stage	6-9 years (88 months)	100%
Negri et al. 2014	632	Two-stage	36 months	98.73%.
Oliver 2012	432	One-stage	12 months	100%
Raes et al. 2016	102	Two-stage	5 years	98.2%
Raes et al. 2018	IIP16 DIP23	Two-stage	96 months	IIP 93.8% DIP 100%
Tonetti et al. 2017	124	Two-stage	1 year to 3 years	98%
Zuiderveld et al. 2018	60	One-stage	12 months	96.7%

Table S4. Soft tissue outcomes.

Study	Approach	F/U periods	Periodontal (soft tissue) outcomes			
			Gingival recession (mm)	BOP (%)	PD (mm)	PI (%)

Arora et al. 2017	One-stage	2-5 years	0.29 ± 0.74 Mesial: 0.05 ± 0.64 Distal: 0.16 ± 0.63	X	X	X
Baer et al. 2013	One-stage	6 months to 3 years	X	6 months: 14.28% 1 year: 11.54% 2 years: 8.51% 3 years: 14.58%	X	X
Cosyn et al. 2011	One-stage	3 years	0.34 (-2.0 to 1.0)	24%	3.17	18%
Guarnieri et al. 2015	One-stage	5 years	0.1 ± 0.61	X	X	X
Meijer et al. 2019	One-stage	12 months	0.5 ± 0.6	X	X	X
Meloni et al. 2020	One-stage	5 years	X	X	2.40-2.58	X
Oliver 2012	One-stage	12 months	0.1 ± 0.3	X	2.1 ± 0.7	X
Canullo et al. 2010	Two-stage	3 years	0.76-0.98	0.55-0.61	2.75-2.80	1.34-1.67
Cooper et al. 2014	Two-stage	5 years	Mesial: 0.13 ± 1.61 Distal: 0.21 ± 1.61	6.6-7.2%	X	X
Cucchi et al. 2017	Two-stage	3 years	X	9.4-13.6%	X	X
Raes et al. 2018	Two-stage	96 months	Mesial 0.44 ± 1.04 Distal: 0.27 ± 0.55	18.2%	2.7 ± 0.5	X
Tonetti et al. 2017	Two-stage	1 to 3 years	X	X	3.3-4.1	X

Table S5. Hard tissue outcomes.

Study	Approach	F/U periods	Marginal bone loss (MBL, mm)
Aguirre-Zorzano et al. 2011	One-stage	92 weeks	Mesial: 0.2 ± 0.4 mm Distal: 0.2 ± 0.4 mm

Arora et al. 2017	One-stage	2-5 years	Mesial: -0.18 ± 1.38 mm Distal: -0.34 ± 1.40 mm
Baer et al. 2013	One-stage	6 months to 3 years	6 months: -1.02 ± 1.12 mm 1 year: -1.12 ± 1.16 mm 2 years: -1.26 ± 1.32 mm 3 years: -1.07 ± 1.40 mm
Carinci 2012	One-stage	7 months	0.2 ± 0.7 mm
Cosyn et al. 2011	One-stage	3 years	1mm (1.13 mm in mesial bone, 0.86 mm in distal bone)
Covani et al. 2012	One-stage	10 years	0.6 to 1.5 mm
Gamper et al. 2017	One-stage	4-6 years	0.51-1.02
Guarnieri et al. 2015	One-stage	5 years	0.98 ± 0.5 mm
Meloni et al. 2020	One-stage	5 years	1.24 ± 0.39 mm
Naeini et al. 2018	One-stage	6-9 years (88 months)	$(-0.89)-0.49$ mm
Oliver 2012	One-stage	12 months	0.3 ± 0.4 mm
Zuiderveld et al. 2018	One-stage	12 months	Mesial: 0.05 ± 0.44 mm Distal: 0.025 ± 0.375 mm
Atieh et al. 2013	Two-stage	1 year	-0.41 ± 0.57 mm
Canullo et al. 2010	Two-stage	3 years	0.34-0.55 mm
Cooper et al. 2014	Two-stage	5 years	-2.06 ± 2.38 mm
Corvino et al. 2020	Two-stage	6 months to 1 year	6 months: 0.33-0.43 mm 1 year: 0.48-0.57 mm
Cucchi et al. 2017	Two-stage	3 years	0.4-0.5 mm
Esposito et al. 2015	Two-stage	4 months to 12 months	$(-0.27)-(-0.13)$ mm
Felice et al. 2015	Two-stage	4 months to 12 months	$(-0.19)-(-0.13)$ mm
Negri et al. 2014	Two-stage	36 months	0.8 ± 0.03 mm
Raes et al. 2018	Two-stage	96 months	$(-0.98)-0.49$ mm