

Endodontic Treatment Results Related to the Apical Extent of Root Canal Fillings

Year	Author(s)	Journal Issue	Sample Number	Review Period or Review Type	Favorable Results (I) inside (O) outside and (A) at the radiographic apex
1961	Grahn H, Hansson L.	Odont Revy 12:146-65	1,277 roots	4-5 yrs.	I 93% O 75% A 83%.
1963	Seltzer S, Bender IB, Turkenkopf S.	JADA 67(5):651-62.	2,921 teeth	6 mos.	I 87% O 71% A 87%
1964	Engstrom, et al.	Odont Revy 15:257-70.	306 teeth	4 yrs.	I+A 79% O 21%
1964	Bender IB, Seltzer S, Turkenkopf S.	OOO 18(4):527-40.	2,335 teeth	5 mos.	I 87% O 71% A 87%
1964	Bender IB, Seltzer S, Turkenkopf S.	OOO 18(4):527-40.	706 teeth.	2 yrs.	I 81% O 69% A 87%
1965	Engstrom B, Lundberg M.	Odont Revy 16:193-203.	125 roots	3-4 yrs.	I 90% O (not reported) A 83%
1969	Storms JL.	JCDA 35(2):83-97.	158 teeth	1 yr.	I 100% O 82% A 90%
1970	Harty FJ, Parkins BJ, Wengraf AM.	Brit Dent J 128(1):65-70.	1,139 teeth	2 yrs.	I+A 91% O 87%
1970	Heling B, Tamshe A.	OOO 30(4):533-36.	213 teeth	1-5 yrs.	I 68% O 57% A 71%
1976	Adenubi JO, Rule DC.	Brit Dent J 141(10):237-41.	870 teeth	1 yr.	I 92% O+A 64%
1979	Kerekes K, Tronstad L.	J Endod 5(3):83-90.	501 roots	1-5 yrs.	I 90% O 66% A 91%
1979	Bergenholtz G, et al.	J Endod 5(10):310-4.	556 retreated roots	2 yrs.	I+A 86% O 53%

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1979	Heling B, Kischinovsky D.	J Br Endod Soc 12(2):83-9.	202 roots	1-16 yrs.	I 88% O 65% A 83%
1981	Barbakow FH, Cleaton-Jones PE, Friedman D.	OOO 51(5):552-9.	124 teeth	1 yr.	I 82% O 91% A 92%
1983	Swartz DB, Skidmore AE, Griffin JA.	J Endod 9(5):198-202.	1,770 canals	1 yr.	I 92% O 63% A 90%
1983	Morse DR, et al.	OOO 56(2):190-7.	485 canals	1 yr.	I 71% O 100% A 100%
1987	Matsumoto T, et al.	J Endod 13(5): 239-42.	223 teeth	2-3 yrs.	I 90% O 40% A 62%
1987	Bystrom A, et al.	Endodont Dent Traum 3:58-63.	79 teeth	2-5 yrs.	I 95% O 90% A 100%
1990	Sjogren U, et al.	J Endod 16(10):498-504.	849 roots	8-10 yrs.	I+A 93% O 75%
1990	Sjogren U, et al.	J Endod 16(10):498-504.	551 roots without PAR	8-10 yrs.	I+A 97% O 93%
1990	Sjogren U, et al.	J Endod 16(10):498-504.	204 roots with PAR	8-10 yrs.	I+A 90% O 76%
1990	Sjogren U, et al.	J Endod 16(10):498-504	94 retreated roots with PAR	8-10 yrs.	I+A 94% O 50%
1993	Smith CS, Setchell DJ, Harty FJ.	IEJ 26:321-33.	821 teeth	5 yrs.	I+A 85% O 75%
1995	Friedman S, et al.	J Endod 21(7):384-90.	378 teeth	6-18 mos.	I+A 78% O 57%
2000	De Moor RJG, et al.	IEJ 33:113-20.	313 teeth	Routine exams	I+A 61% O 25%
2001	Peak JD, et al.	Brit Dent J 190(3):140-4.	406 teeth	1 yr.	I+A 81% O 89%
2002	Hoskinsen SE, et al.	OOO 93(6):705-15.	489 roots	4-5 yrs.	I 81% O 76% A 70%

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2002	Hommeze GM, Coppens CR, De Moor RJ.	IEJ 35:680-9.	745 teeth	Routine exams	I+A 95% O 47%
2002	Lupi-Pegurier L, et al.	IEJ 35:690-7.	450 teeth	Routine exams	I+A 87% O 33%
2003	Boltacz-Rzepkowska E, Pawlicka H.	IEJ 36:27-32.	282 teeth	Records review	I+A 88% O 91%
2003	Dugas NN, et al.	IEJ 36:181-92.	383 teeth	Routine exams	I+A 57% O 39%
2004	Fristad I, Molven O, Halse A.	IEJ 37:12-18.	122 roots	10-17 yrs.	I 85% O+A 86%
2004	Fristad I, Molven O, Halse A.	IEJ 37:12-18.	122 roots	20-27 yrs.	I 98% O+A 94%
2004	Alley BS, et al.	OOO 98(1)115-18.	350 teeth	5 yrs.	I 92% O 100% A 98%
2004	Farzaneh M, et al.	J Endod 30(5):302-9.	242 teeth	4-6 yrs.	I+A 87% I+O 77%
2004	Farzaneh M, Abitol S, Friedman S.	J Endod 30(9):627-33.	99 retreated teeth	4-6 yrs.	I+A 86% I+O 76%
2005	Siqueira JF, et al.	OOO 100(3):369-74.	2,051 teeth	Routine exams	I+A 50% O 45%
2005	Tsuneishi M, et al.	OOO 100(5):531-5.	3,320 teeth	Routine exams	I+A 61% O 20%
2005	Stoll R, Betke K, Stachniss V.	J Endod 31(11):783-90.	914 teeth	10 yrs.	I 74% O 74% A 94%
2006	Gesi A, et al.	OOO 101(3):379-88.	256 teeth	1-3 yrs.	I+A 94% O 91%
2007	Doyle SL, et al.	J Endod 33(4):399-402.	196 teeth	1 yr.	I 94% O 60% A 81%
2007	Imura N, et al.	J Endod 33(11):1278-82.	2,000 teeth	18-24 mos.	I 92% O 89% A 87%
Summary: 88% (37/42) of these studies reported more favorable results with I, A and I+A. 12% (5/42) of these studies reported less favorable results with O and O+A.					