

Supplementary

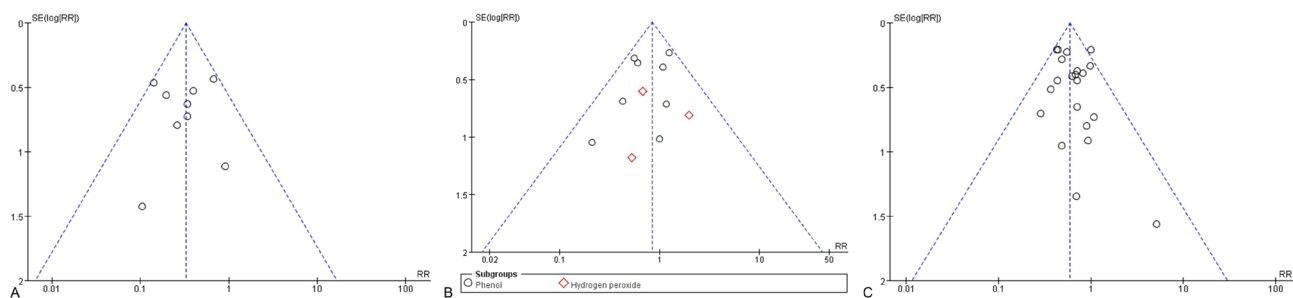


Figure S1 Funnel plot for recurrence in (A) high-speed burring *vs.* control, (B) chemical adjuvants *vs.* control and (C) PMMA *vs.* control. SE, standard error; RR, risk ratio; PMMA, polymethyl methacrylate.

Table S1 Characters of included studies

Study	Author	Year	Study type	Country	N	Follow up (m) [mean (range)]	Tumor type		Tumor location		Group	n	HSB	Chemical adjuvants		PMMA	Bone graft	Recurrence																																															
							Primary	Recurrent	Appendicular	Axial				Phenol	H ₂ O ₂			n	Rate																																														
(14)	Niu	2012	Retrospective	China	395	49 (18-256)	248	147	395	0	a	59	√			√		6	10.2%																																														
																				b	27	√			√		3	11.1%																																					
																													c	30	√			√	√	1	3.3%																												
																																						d	9				√		5	55.6%																			
																																															e	32					√	18	56.3%										
																																																								f	212						10	4.7%	
Resection																																																																	
(15)	Errani							2010	Retrospective	Italy	349	91 (36-204)	NR	349	0	a	64	√	√		√		8	12.5%																																									
																									b	136	√	√				√	24	17.6%																															
																																			c	149						18	12.0%																						
																																												Resection																					
																																												(16)	Klenke						2011	Retrospective	USA	118	36 (36-233)	118	0	99	19	a	22	√			√
		b	32	√	√																																																												
c	40							√	√			√	6	15.0%																																																			
															(17)	Zou	2019	Retrospective	China	58	21-321	42	16	58	0	a	12	√			√	3	25.0%																																
																																		b	9	√				√	2	22.2%																							
																																											c			37																			
																																												Resection																					
		(8)	Balke	2008	Retrospective	German	214																																					59.8 (8.2-280)	139											75	200	14	a	46					30
b	9							√					2	22.2%																																																			
															c	45					√	16	35.6%																																										
																								d	21	√			√	5	23.8%																																		
																																e	25	√		√	√	4	16.0%																										
																																								f	7						√	√	3	42.9%															
		g	18	√			√																																					√	2						11.1%														
h	17							√	√		√	√	1	5.9%																																																			
															(11)	Becker	2008	Retrospective	German	384	64.2 (1-440)	256	128																													384	0	a	103					50	49.0%				
																								b	102					√	22																															22.0%			
																																c	74	√	√			20	27.0%																										
																																								d	27							4	15.0%																
		phenol, alcohol, cyclophosphamide or cauterization without PMMA																																																															
Resection										2	1.6%																																																						
(10)	Kivioja											2008	Prospective	Scandinavia	294	60 (6-90)	NR	294	0	a	147																													√		32	22.0%												
																								b	47						√																							24	52.0%										
																																c	92						11																	12.0%									
																																								Resection																									

Table S1 (continued)

Table S1 (continued)

Study	Author	Year	Study type	Country	N	Follow up (m) [mean (range)]	Tumor type		Tumor location		Group	n	HSB	Chemical adjuvants		PMMA	Bone graft	Recurrence					
							Primary	Recurrent	Appendicular	Axial				Phenol	H ₂ O ₂			n	Rate				
(18)	Tang	2019	Retrospective	China	256	64.2 (24-126)	256	0	256	0	a	94				√		40	42.6%				
																		b	42		√	18	42.9%
																		c	120			24	20.0%
(9)	Jones	2006	Retrospective	USA	31	42	25	6	31	0	a	6	√			√		1	16.7%				
																		b	11		√	0	0.0%
																		c	1			0	0.0%
																		d	13			5	38.5%
(19)	Gaston	2011	Retrospective	UK	330	76.5 (2-319)	330	0	300	30	a	84	√		√		12	14.3%					
																	b	246		√	73	29.7%	
(20)	Pietschmann	2010	Retrospective	Belgium	46	72 (1-289)	40	25	42	4	a	34	√	√			√	11	32.4%				
																		b	13		√	7	53.9%
																		c	18			3	16.7%
(13)	Trieb	2001	Retrospective	Austria	47	132 (48-516)	47	0	47	0	a	14				√	3	21.0%					
																	b	12		√	3	25.0%	
(6)	Klenke	2011	Retrospective	USA	46	134 (37-337)	0	46	46	0	a	14	√	√		√		2	14.3%				
																		b	14		√	7	50.0%
																		c	18			1	6.0%
																		b	38			5	13.2%
(21)	Gao	2014	Retrospective	China	65	38.8 (6-84)	65	0	65	0	a	34	√			√	12	35.3%					
																	b	31		√	4	12.9%	
(22)	Benevenia	2017	Retrospective	USA	43	59 (12-234)	NR		43	0	a	4	√	√	√	√	√	1	25.0%				
																		b	17		√	3	17.6%
																		c	22		√	6	27.3%
(23)	O'Donnell	1994	Retrospective	USA	60	48 (24-120)	60	0	60	0	a	24	√			√		4	16.7%				
																		b	11		√	2	18.2%
																		c	6		√	1	16.7%
																		d	19			8	42.1%
(24)	Dürr	1999	Retrospective	German	29	61 (6-178)	20	9	27	2	a	11	√	√			√	1	9.1%				
																		b	7		√	3	42.9%
																		c	11			1	9.1%

Table S1 (continued)

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Study	Author	Year	Study type	Country	N	Follow up (m) [mean (range)]	Tumor type		Tumor location		Group	n	HSB	Chemical adjuvants		PMMA	Bone graft	Recurrence		
							Primary	Recurrent	Appendicular	Axial				Phenol	H ₂ O ₂			n	Rate	
(25)	Ward	2002	Retrospective	USA	31	58.8 (12-115.2)	27	4	31	0	a	7	√	√		√		1	14.3%	
												b	6	√	√		√	√	0	0.0%
												c	9	√	√				1	11.1%
												d	9			Resection			0	0.0%
(26)	van der Heijden	2012	Retrospective	Netherland	93	96 (24-288)	93	0	93	0	a	96		√		√		29	30.2%	
												b	27				√		10	37.0%
(27)	Boons	2002	Retrospective	Netherland	36	84 (24-372)	29	7	33	3	a	2	√				√		0	0.0%
												b	4	√			√		1	25.0%
												c	12	√				√	5	41.7%
												d	5	√			√		1	20.0%
												e	11			Resection			0	0.0%
(28)	Balke	2009	Retrospective	German	67	45.3 (1.4-208)	0	67	65	2	a	9						6	66.7%	
												b	3			√	√		0	0.0%
												c	11				√		5	45.5%
												d	10	√		√	√		3	30.0%
												e	13	√			√		2	15.4%
												f	11			Resection			0	0.0%
(29)	van der Heijden	2014	Retrospective	Netherland	132	93 (24-266)	NR	NR	132	0	a	40		√		√		10	25.0%	
												b	42		√		√	√	13	31.0%
												c	26	√			√		8	31.0%
												d	24	√				√	9	38.0%
(5)	Li	2016	Retrospective	China	179	60.2 (36-112)	NR	NR	NR	NR	a	35	√				√	8	22.9%	
												b	49	√			√		8	16.3%
												c	16						6	37.5%
												d	27			√			12	44.4%
												e	52			Resection			4	7.7%
(30)	Kremen	2012	Retrospective	USA	216	47 (0.1-312)	185	31	211	5	a	108		√	√		√	11	10.2%	
												b	55		√	√		√	9	16.4%
												c	51			Resection			1	2%

HSB=high-speed burring, PMMA= polymethyl methacrylate, NR=not recorded.

Table S2 The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses

Study	Selection				Comparability	Outcome			Quality score
	Representativeness of the Exposed Cohort	Selection of the Non-Exposed Cohort	Ascertainment of Exposure	Demonstration That Outcome of Interest Was Not Present at Start of Study	Comparability of Cohorts on the Basis of the Design or Analysis	Assessment of Outcome	Was Follow-Up Long Enough for Outcomes to Occur	Adequacy of Follow Up of Cohort	
Niu (14)	★	★	★	★	★★	★	★	★	9
Errani (15)	★	★	★	★	★★	★	★	★	9
Klenke (16)	★	★	★	★	★★	★	★	★	9
Zou (17)		★	★	★	★	★	★	★	7
Balke (8)	★	★	★	★	★	★	★	★	8
Becker (11)	★	★	★	★	★★	★	★	★	9
Kivioja (10)	★	★	★	★	★★	★	★	★	9
Tang (18)	★	★	★	★	★	★	★	★	8
Jones (9)	★	★	★	★		★	★	★	7
Gaston (19)	★	★	★	★	★★	★	★	★	9
Pietschmann (20)	★	★	★	★	★	★	★	★	8
Trieb (13)	★	★	★	★	★★	★	★	★	9
Klenke (6)		★	★	★	★★	★	★	★	8
Gao (21)	★	★	★	★	★★	★	★	★	9
Benevenia (22)	★	★	★	★	★★	★	★	★	9
O'Donnell (23)	★	★	★	★	★★	★	★	★	9
Dürr (24)	★	★	★	★	★★	★	★	★	9
Ward (25)	★	★	★	★	★	★	★	★	8
van der Heijden (26)	★	★	★	★	★★	★	★	★	9
Boons (27)	★	★	★	★	★	★	★	★	8
Balke (28)		★	★	★	★★	★	★	★	8
van der Heijden (29)	★	★	★	★	★★	★	★	★	9
Li (5)	★	★	★	★	★	★	★	★	8
Kremen (30)	★	★	★	★	★	★	★	★	8