Appendix

Fig. E-1

Case series quality appraisal checklist[13] (reproduced from: Institute of Health Economics [IHE]. Quality Appraisal of Case Series Studies Checklist. Edmonton [AB]: Institute of Health Economics; 2014. Available from: http://www.ihe.ca/research-programs/rmd/cssqac/cssqac-about).

Quality Appraisal Checklist for Case Series Studies*

Study objective		
1.	**Was the hypothesis/aim/objective of the study clearly stated?**	Yes ☐ Partial ☐ No ☐
Study design		
2.	**Was the study conducted prospectively?**	Yes ☐ Unclear ☐ No ☐
3.	**Were the cases collected in more than one centre?**	Yes ☐ Unclear ☐ No ☐

4.	**Were patients recruited consecutively?**	Yes	☐
		Unclear	☐
		No	☐
Study population			
5.	**Were the characteristics of the patients included in the study described?**	Yes	☐
		Partial	☐
		No	☐
6.	**Were the eligibility criteria (i.e. inclusion and exclusion criteria) for entry into the study clearly stated?**	Yes	☐
		Partial	☐
		No	☐
7.	**Did patients enter the study at a similar point in the disease?**	Yes	☐
		Unclear	☐
		No	☐
Intervention and co-intervention			
8.	**Was the intervention of interest clearly described?**	Yes	☐
		Partial	☐
		No	☐
9.	**Were additional interventions (co-interventions) clearly described?**	Yes	☐
		Partial	☐
		No	☐

Outcome measure		
10.	**Were relevant outcome measures established a priori?**	Yes ☐ Partial ☐ No ☐
11.	**Were outcome assessors blinded to the intervention that patients received?**	Yes ☐ Unclear ☐ No ☐
12.	**Were the relevant outcomes measured using appropriate objective/subjective methods?**	Yes ☐ Partial ☐ No ☐
13.	**Were the relevant outcome measures made before and after the intervention?**	Yes ☐ Unclear ☐ No ☐
Statistical analysis		
14.	**Were the statistical tests used to assess the relevant outcomes appropriate?**	Yes ☐ Unclear ☐ No ☐
Results and conclusions		
15.	**Was follow-up long enough for important events and outcomes to occur?**	Yes ☐ Unclear ☐ No ☐

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16.	**Were losses to follow-up reported?**	Yes	☐
		Unclear	☐
		No	☐
17.	**Did the study provided estimates of random variability in the data analysis of relevant outcomes?**	Yes	☐
		Partial	☐
		No	☐
18.	**Were the adverse events reported?**	Yes	☐
		Partial	☐
		No	☐
19.	**Were the conclusions of the study supported by results?**	Yes	☐
		Unclear	☐
		No	☐
Competing interests and sources of support			
20.	**Were both competing interests and sources of support for the study reported?**	Yes	☐
		Partial	☐
		No	☐

*Note: Assessor(s) may decide to remove from the checklist the items that are not applicable to their project.

TABLE E-1 Search Strategy

The following electronic databases searches were performed:
1. PubMed (22 April 2016)
2. Scopus (23 April 2016)
3. Cochrane library (24 April 2016)
4. Web of Science (24 April 2016)
Keywords used:
"reverse shoulder"
OR "reverse total shoulder"
OR "inverse shoulder"
OR "inverse total shoulder"
OR "Grammont prosthesis"
Results of search:
PubMed: 1,049
Scopus: 1,149
Cochrane: 20
Web of Science: 595
Total: 2,813 records

TABLE E-2 Studies Reporting on the Use of Uncemented Stems Exclusively*

Study	Study Type	Quality Score†	No. of Cases	Female (%)	Mean Age (yr)	Mean F/U (mo)	Etiology	RLL	Loose Stems	Revised Stems
Al-Hadithy, 2014[19]	Retrospective case series, Level IV	17	41	78.4	79	60	CTA	2	0	0
Bogle, 2013[24]	Retrospective case series, Level IV	15	40	NR	71.6	24	Mixed	4	0	0
Giuseffi, 2014[26]	Retrospective case series, Level IV	15	44	70.7	76	27	Mixed	NR	0	0
Kadum, 2014[27]	Prospective cohort, Level III	NOS 7	15	73.3	72	35	Mixed	1	0	0
Rittmeister, 2001[28]	Retrospective case series, Level IV	15	6	83	60.3	54.3	RA/IA	NR	0	0
Saier, 2015[29]	Prospective case series, Level IV	17	28	62.9	72	24	ICT/CTA/OA	0	0	0
Sebastiá-Forcada, 2014[30]	PRCT, Level I	Jadad 4	31	87.1	74.7	29.4	Acute fracture	4	0	0
Woodruff, 2003[16]	Retrospective case series, Level IV	16	13	100	64	87	RA/IA	NR	0	0

*F/U = follow-up, RLL = humeral radiolucent lines, CTA = cuff tear arthropathy, NR = not reported, RA = rheumatoid arthritis, IA = inflammatory arthritis, ICT = irreparable cuff tear, OA = osteoarthritis, and PRCT = prospective randomized controlled trial. †If not otherwise stated, the score is for the Case Series Quality Appraisal Checklist.

TABLE E-3 Studies Reporting on the Use of Cemented Stems Exclusively*

Study	Study Type	Quality Score†	No. of Cases	Female (%)	Mean Age (yr)	Mean F/U (mo)	Etiology	RLL	Loose Stems	Revised Stems
Atalar, 2014[31]	Retrospective case series, Level IV	15	14	85.7	74	34	CTA	0	0	0
Athwal, 2016[32]	Retrospective case series, Level IV	17	24	83.3	75	36	CTA	2	0	0
Boileau, 2006[8]	Retrospective case series, Level IV	16	38	80	74.3	40	Mixed	29	1	1
Boileau, 2011[33]	Prospective case series, Level IV	17	42	66.7	72	28	Mixed	NR	0	0
Bonnevialle, 2015[34]	Retrospective case series, Level IV	15	8	70	55	42	Tumor	2	1	0
Bufquin, 2007[35]	Prospective case series, Level IV	18	40	95.3	78	22	Acute fracture	NR	0	0
Castricini, 2013[20]	Prospective case series, Level IV	18	62	73.8	72.5	60	Mixed	5	0	0
Cazeneuve, 2012[21]	Retrospective case series, Level IV	15	37	94.6	75	88	Acute fracture	6	0	0
Cuff, 2012[17]	Prospective case series, Level IV	18	74	67.6	70.4	62	Mixed	2	1	1
Cuff, 2013[36]	Prospective cohort, Level II	NOS 9	24	58.3	74.4	29	Acute fracture	NR	0	0
De Wilde, 2011[22]	Retrospective case series, Level IV	15	9	44.4	45.1	92	Tumor	1	1	1
Ekelund, 2011[37]	Retrospective case series, Level IV	16	23	75.9	68	45	CTA	NR	0	0
Flury, 2011[38]	Retrospective case series, Level IV	15	19	85	67.7	46	Revision	1	0	0
Formaini, 2015[39]	Retrospective case series, Level IV	17	25	68	77	17	Acute fracture	0	0	0
Frankle, 2005[40]	Retrospective case series, Level IV	17	60	68	71	33	Mixed	NR	0	0
Gallinet, 2009[41]	Retrospective cohort, Level III	NOS 8	16	81	74	12.4	Acute fracture	5	0	0
Garofalo, 2015[42]	Retrospective case series, Level IV	15	22	77	77.2	24	Acute fracture	NR	0	0
Garofalo, 2015[43]	Retrospective case series, Level IV	17	87	71.3	76.2	27	Acute fracture	NR	0	0
Giannotti, 2014[44]	Retrospective case	16	36	87.9	75	37	CTA	NR	0	0

	series, Level IV								
Grassi, 2014[45]	Retrospective case series, Level IV	14	15	100	75	22	Acute fracture	0	0	0
Greiner, 2014[46]	Retrospective case series, Level IV	16	50	77.6	69	34	Fracture sequelae	NR	0	0
Greiner, 2015[47]	PRCT, Level I	Jadad 4	31	64.7	75.4	22	CTA	NR	0	0
Guven, 2016[48]	Retrospective case series, Level IV	15	10	50	49.4	18.2	Tumor	NR	0	0
Iannotti, 2012[49]	Retrospective case series, Level IV	15	4	25	65.5	38.5	Revision	NR	0	0
Jacobs, 2001[50]	Retrospective case series, Level IV	14	7	100	72	26	CTA	NR	0	0
John, 2010[51]	Prospective case series, Level IV	16	17	66.7	67.3	24.3	ICT	NR	0	0
Kaa, 2013[52]	Retrospective case series, Level IV	15	10	62.5	41.5	46.4	Tumor	NR	2	2
Kaisidis, 2014[53]	Prospective case series, Level IV	15	29	55.2	81	26	Acute fracture	NR	0	0
Klein, 2008[54]	Prospective case series, Level IV	15	20	70	74.9	33.3	Acute fracture	0	0	0
Lenarz, 2011[55]	Retrospective case series, Level IV	17	30	90	76.7	23	Acute fracture	0	0	0
Levy, 2007[56]	Retrospective case series, Level IV	16	19	61.1	72	38	Revision	1	1	0
Lollino, 2009[57]	Retrospective case series, Level IV	15	15	86.7	68.4	24	Mixed	NR	0	0
Lopiz, 2016[58]	Retrospective case series, Level IV	17	42	81	81.7	32.6	Acute fracture	0	0	0
Mizuno, 2012[59]	Prospective case series, Level IV	14	47	69.6	74.4	30	Mixed	0	0	0
Muh, 2013[60]	Retrospective case series, Level IV	17	67	56.1	52.2	36.5	Mixed	NR	0	0
Paladini, 2005[61]	Retrospective case series, Level IV	15	7	71.4	68	30	Revision	1	0	0
Raiss, 2014[62]	Retrospective case series, Level IV	17	32	87.5	68	48	Fracture nonunion	NR	0	0
Reitman, 2011[63]	Retrospective case series, Level IV	14	13	61.5	70	29	Acute fracture	NR	0	0
Stephens, 2015[64]	Retrospective cohort, Level III	NOS 9	16	64.7	70.5	51	Revision	NR	3	0

von Engelhardt, 2015[65]	Retrospective case series, Level IV	16	11	87.7	73.2	17.5	Mixed	NR	0	0
Werner, 2014[66]	Retrospective case series, Level IV	16	21	85.7	71	59	Chronic dislocation	NR	0	0
Willis, 2012[67]	Retrospective case series, Level IV	16	16	75	65	37	Fracture malunion	2	0	0
Young, 2011[68]	Retrospective case series, Level IV	16	18	87.5	70.1	46	RA/IA	NR	0	0
Zafra, 2014[69]	Prospective case series, Level IV	18	35	80	69	51	Fracture nonunion	23	0	0

*F/U = follow-up, RLL = humeral radiolucent lines, CTA = cuff tear arthropathy, NR = not reported, PRCT = prospective randomized controlled trial, ICT = irreparable cuff tear, RA = rheumatoid arthritis, and IA = inflammatory arthritis. †If not otherwise stated, the score is for the Case Series Quality Appraisal Checklist.

TABLE E-4 Studies Reporting on the Use of Both Cemented and Uncemented Stems*

Study	Study Type	Quality Score†	Cement	No. of Cases	Female (%)	Mean Age (yr)	Mean F/U (mo)	Etiology	RLL	Loose Stems	Revised Stems
Boughebri, 2013[70]	Retrospective case series, Level IV	15	Yes	2	71.4	67.5	33.2	CTA	0	0	0
			No	13	71.4	67.5	33.2	CTA	0	0	0
Budge, 2013[71]	Prospective case series, Level IV	19	Yes	13	80	67	34.5	Revision	0	0	0
			No	2	80	67	34.5	Revision	NR	0	0
Ek, 2013[18]	Retrospective case series, Level IV	16	Yes	29	41.5	60	93	ICT	NR	0	0
			No	11	41.5	60	93	ICT	NR	0	0
Grassi, 2009[72]	Retrospective case series, Level IV	14	Yes	15	92	75	42	Mixed	1	0	0
			No	8	92	75	42	Mixed	2	0	0
Hattrup, 2012[73]	Retrospective case series, Level IV	17	Yes	14	70.6	70	37	RA/IA	7	1	0
			No	5	70.6	70	37	RA/IA	0	0	0
Hattrup, 2016[74]	Retrospective case series, Level IV	16	Yes	14	76.9	67	37.4	Fracture sequelae	4	0	0
			No	6	76.9	67	37.4	Fracture sequelae	0	0	0
Irlenbusch, 2015[75]	Prospective case series, Level IV	15	Yes	37	70.6	71.9	25.5	Mixed	0	0	0
			No	18	70.6	71.9	25.5	Mixed	0	0	0
Katz, 2016[76]	Retrospective case series, Level IV	17	Yes	34	74	72	45	ICT/CTA	NR	0	0
			No	106	74	72	45	ICT/CTA	NR	3	1
King, 2015[3]	Retrospective cohort, Level III	NOS 8	Yes	25	84	73.6	50.4	ICT/CTA/OA	0	0	0
			No	16	31.25	71.6	48	ICT/CTA/OA	1	0	0
Leung, 2012[77]	Retrospective cohort, Level III	NOS 9	Yes	31	63	72	36	CTA	NR	0	0
			No	5	63	72	36	CTA	NR	0	0
Martinez, 2012[78]	Retrospective case series, Level IV	15	Yes	20	59.1	77	48	Fracture sequelae	NR	0	0
			No	24	59.1	77	48	Fracture sequelae	NR	0	0
Melis, 2011[5]	Retrospective case series, Level IV	15	Yes	34	69.2	69.4	115	Mixed	22	4	0

			No	34	69.2	69.4	120	Mixed	17	2	0
Middleton, 2014[79]	Retrospective case series, Level IV	16	Yes	66	53.9	67	50	Mixed	NR	1	1
			No	23	53.9	67	50	Mixed	NR	0	0
Ross, 2015[80]	Retrospective case series, Level IV	16	Yes	14	87	79	54.8	Acute fracture	1	0	0
			No	15	87	79	54.8	Acute fracture	1	0	0
Russo, 2015[23]	Retrospective case series, Level IV	15	Yes	3	88	75	60	Acute fracture	0	0	0
			No	47	88	75	60	Acute fracture	4	0	0
Sadoghi, 2011[81]	Prospective cohort, Level III	NOS 9	Yes	52	55.9	66	42	ICT	NR	3	3
			No	8	55.9	66	42	ICT	NR	0	0
Schneeberger, 2014[82]	Retrospective case series, Level IV	14	Yes	5	68.4	65	54	ICT	1	0	0
			No	13	68.4	65	54	ICT	1	0	0
Shi, 2015[83]	Retrospective case series, Level IV	16	Yes	6	100	66.2	43	Fracture sequelae	NR	0	0
			No	15	73.3	66.1	44.3	CTA	NR	0	0
Simovitch, 2015[84]	Retrospective case series, Level IV	16	Yes	24	62.5	73	43	Mixed	NR	0	0
			No	17	62.5	73	43	Mixed	NR	0	0
Statz, 2016[85]	Retrospective case series, Level IV	15	Yes	17	58.5	68	32.4	Mixed	0	0	0
			No	24	58.5	68	32.4	Mixed	1	1	1
Wiater, 2014[4]	Retrospective cohort, Level III	NOS 8	Yes	37	59.5	72	37	ICT/CTA	1	0	0
			No	64	68.8	72.5	32.4	ICT/CTA	2	0	0
Wirth, 2016[86]	Retrospective case series, Level IV	16	Yes	4	70	75	24	Mixed	NR	0	0
			No	72	70	75	24	Mixed	NR	0	0
Young, 2009[25]	Retrospective case series, Level IV	14	Yes	8	79.2	78.9	38	Mixed	NR	0	0
			No	41	79.2	78.9	38	Mixed	NR	0	0

*F/U = follow-up, RLL = humeral radiolucent lines, CTA = cuff tear arthropathy, NR = not reported, ICT = irreparable cuff tear, RA = rheumatoid arthritis, IA = inflammatory arthritis, and OA = osteoarthritis. †If not otherwise stated, the score is for the Case Series Quality Appraisal Checklist.