

Is a Silastic Radial Head Still a Reasonable Option?

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Abstract

Background The importance of the radial head to elbow function and stability is increasingly apparent. Although preservation of the native radial head is preferred, severely comminuted fractures may necessitate resection or arthroplasty. Silastic radial head arthroplasty has been condemned on the basis of several sporadic reports of silicone synovitis. However, problems of “overstuffing,” cartilage wear, and motion loss are becoming apparent with metal prostheses, indicating this also is not an ideal solution. Thus, the choices remain controversial.

Questions/purposes We asked whether intact or reconstructed primary elbow stabilizers permit use of silastic radial head implants without fragmentation, failure, and silicone synovitis.

Methods We retrospectively reviewed 23 patients with unreconstructable radial head fractures who were treated with silastic radial head arthroplasty and concomitant repair and/or reconstruction of the medial ulnar collateral ligament and/or lateral ulnar collateral ligament. Analysis included range of motion, pain, stability, and radiographic assessments; Disabilities of the Arm, Shoulder, and Hand

(DASH) questionnaire; and Mayo Elbow Performance Score (MEPS). The minimum followup was 16 months (average, 69.6 months; range, 16–165 months).

Results At last followup, the mean elbow flexion was 145°, extension 11°, supination 80°, and pronation 83°. The mean MEPS score was 88.9. The mean DASH score was 11.8. There were eight reoperations, none resulting from failure of the radial head implants.

Conclusions These results demonstrate silastic radial heads can be used with low complication rates and without evidence of synovitis when concomitant elbow ligament repair or reconstruction is performed.

Level of Evidence Level IV, therapeutic study. See Guidelines for Authors for a complete description of levels of evidence.

Introduction

The radial head is an important secondary valgus restraint [16, 25] and can bear up to 60% of the load transmitted from the forearm [9]. The goals of treating radial head fractures are to restore stability, preserve motion, and maintain length of the radius. If preservation of the head is not possible, prosthetic replacement has been advocated to preserve the radiocapitellar articulation. Currently, several models of radial head prosthesis are in use, including monopolar, bipolar, cemented, or press-fit implants. Regardless of design, recent literature has favored metal prostheses [1, 24, 30, 36, 37] despite evidence of altered joint contact pressures in radiocapitellar articulations involving metallic implants [18]. “Overstuffing” as a result of an excessively large prosthesis has received considerable attention [4, 40] and problems of persistent pain and radiographic evidence of arthritis (Fig. 1A–B) are

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Each author certifies that his or her institution approved the human protocol for this investigation, that all investigations were conducted in conformity with ethical principles of research, and that informed consent for participation in the study was obtained.

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becoming apparent, suggesting, like other metal-on-cartilage interfaces, metal hemiarthroplasty may not be an ideal solution (Fig. 2).

Meanwhile, the use of silastic radial head implants is widely condemned. Once commonly used in the 1970s and 1980s, this type of prosthesis is currently maligned based on reports of mechanical failure of the implant, inflammatory arthritis, and reactive synovitis [5, 20, 27, 38, 39]. Our review of the literature, however, suggests this poor reputation has been earned on the basis of limited data with questionable surgical indications and technique.

In the normally functioning elbow, the anterior band of the medial ulnar collateral ligament (MUCL) provides the primary stabilization against valgus force [6, 12, 16, 23, 32]. Transection of the anterior bundle alone is sufficient to create demonstrable instability on the application of a valgus force and abnormally high radiocapitellar pressures [28]. The interosseous membrane (IOM) functions as another primary stabilizer of the elbow by providing longitudinal restraint to proximal migration of the radius during axial loading [21]. Radial head fracture or fracture/dislocation is attended by a high incidence of ligament damage and repair of the collateral ligaments is critical to re-establishing normal joint biomechanics during surgical

treatment of these injuries [14, 16]. In an in vitro model, Pollock et al. recently demonstrated repair of the lateral ulnar collateral ligament (LUCL) and MUCL restored

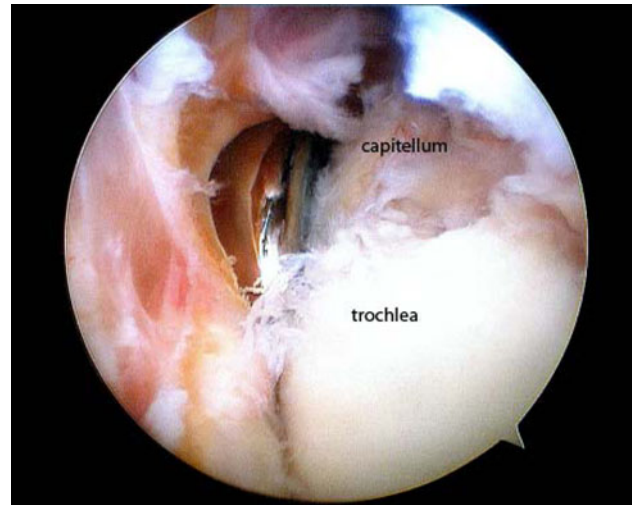
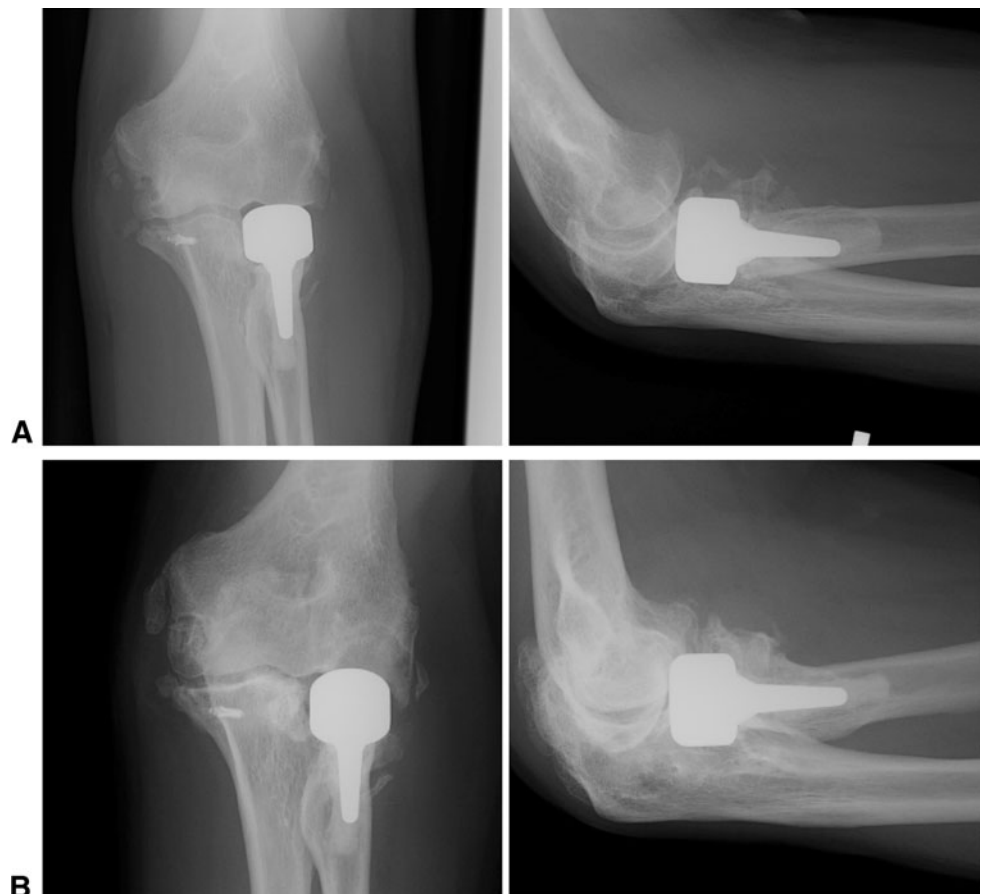


Fig. 2 Intraoperative arthroscopy image showing the articular wear of the capitellum from a metallic radial head prosthesis. Radiographs demonstrate the prosthesis is in good position. Criteria for “overstuffing” are indefinite, but the prosthesis does not appear grossly oversized.

Fig. 1A–B AP and lateral views of a metallic radial head prosthesis (A) 4 months after implantation and (B) 3 years after implantation demonstrating degeneration of the capitellum.



elbow stability to varus and valgus stress, even in the presence of a displaced Type II coronoid fracture, suggesting evaluation and repair of the collateral ligaments is essential in cases of persistent instability [29]. When both the MUCL and IOM are intact, the radial head functions as a secondary stabilizer. However, if the MUCL or IOM is ruptured, the radial head becomes the primary stabilizer and is subjected to supraphysiological loads. In throwing athletes, such increased loading is associated with premature arthrosis even with only an isolated ligament rupture, a situation that becomes further confounded by additional trauma and instability [3]. We speculate that the reported failures of silicone prostheses were caused by supraphysiologically high loads borne by the prostheses as a consequence of rupture and functional incompetence of the primary restraints.

Our purpose was to demonstrate these implants can be used without reported complications to restore function as assessed by standardized, validated outcome instruments (Disabilities of the Arm, Shoulder, and Hand [DASH] and Mayo Elbow Performance Score [MEPS]) if combined with ligamentous reconstruction and/or repair at the time of initial treatment.

Patients and Methods

We retrospectively reviewed 26 patients who received silastic radial head implants (Dow Corning Corporation Silastic Swanson Radial Head Implant, Midland, MI) combined with treatment of the ligamentous injury between 1995 and 2007. One patient died 7 months after surgery, and two others were lost to followup. This left 23 patients with an average age of 48 years (range, 19–75 years). The arthroplasties were performed in 13 women and 10 men. There were two Workers' Compensation cases. Thirteen arthroplasties were performed on the patient's dominant arm. The minimum followup was 16 months (average, 69.6 months; range, 16–165 months; Table 1). We have prior approval from our Institutional Review Board.

The indications for radial head arthroplasty included fracture–dislocation of the elbow with an unsalvageable Type III or IV radial head fracture. Fifteen patients presented for initial management of the injury after sustaining acute trauma to the elbow. In these cases, the elbow was stressed intraoperatively to assess ligamentous integrity. Instability was treated by primary repair of the LUC and/or reconstruction of the MUCL with a palmaris longus tendon graft. Of these 15 patients presenting acutely, six patients sustained fracture–dislocations of the elbow, seven presented with terrible triad injuries, and two had Monteggia-variant fracture–dislocations. One patient in the fracture–dislocation group underwent an ipsilateral open

reduction and internal fixation of the scaphoid and reconstruction of a thumb carpometacarpal joint volar ligament reconstruction (Patient 17).

Two of the 23 patients presented for delayed treatment of their injured elbows after failing initial nonoperative management. One had a radial head nonunion, whereas the other had a neglected radial head fracture with MUCL rupture.

Six other patients presented after a failed index procedure. They underwent revision surgery with contracture release and silastic radial head arthroplasty. Three of these six had initially sustained terrible triad injuries, and one had sustained a Monteggia fracture–dislocation. The remaining two patients underwent revision for joint contracture after placement of a metallic radial head implant or after metallic radial head breakage.

The silastic implant was never used in cases of Essex-Lopresti injuries because no reliable means of repairing or reconstructing the interosseous membrane is known. Metallic radial heads were used instead.

All surgery was performed by the senior author (MRH). After induction of anesthesia and prepping of the extremity, valgus stability of the elbow is assessed first. If there is valgus instability, a medial approach to the elbow is carried out first, and the MUCL is reconstructed with a tendon autograft using the Jobe [17] or the docking technique [35]. After skin closure of the medial side, a lateral midaxial incision is used. The radial head is exposed anterior to the LUC, and the arthroplasty is carried out. The LUC is either spared if intact or repaired if torn. A coronoid fracture is repaired from either the medial or the lateral approach.

Postoperatively, the patients are splinted for 3 to 5 days and are started on both supervised and self-administered overhead ROM exercises while avoiding valgus stress. Strengthening begins at 10 weeks.

The patients were followed up on a weekly basis for the first 4 weeks and then every 2 to 4 weeks for the next 3 months. Sixteen patients were able to return for a physical examination conducted by the senior author (MRH), the fellow (YM), or a senior resident (JB) in the office. The physical examination included ROM measurements to the nearest 5° using a goniometer and stability assessment of the elbow with varus and valgus stresses under fluoroscopy. DASH [13] and MEPS [26] were assessed as well. Seven patients were unable to come in for physical examination; pain assessment, DASH, and MEPS scores were obtained through a phone interview conducted by the fellow (YM) or the senior resident (JB). ROM measurements for these patients were taken from a chart review based on their most recent office visit at an average of 57 months after their procedure (range, 20–109 months).

Two of us (YM and MRH, the treating surgeon) evaluated all radiographs. All patients had radiographs at last

Table 1. Summary of patient demographics and treatment

Patient number	Age (years)	Gender	Dominant arm	Workers' compensation	Length of followup (months)	Diagnosis	Procedure
1	66	F	Y	N	59	RH fracture, MUCL rupture, LUCL rupture, coronoid fx	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid
2	75	F	N	N	19	RH fracture, MUCL rupture, LUCL rupture	RH arthroplasty, MUCL repair, LUCL repair
3	40	M	N	N	16.5	RH fracture, MUCL rupture, LUCL rupture, coronoid fx	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid
4	74	F	N	N	17.5	RH fracture, MUCL rupture, LUCL rupture, coronoid fx	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid
5	29	F	Y	N	118	Type IV Monteggia fracture dislocation	RH arthroplasty, ORIF proximal ulna
6	64	F	Y	N	45.5	RH fracture, LUCL rupture	RH arthroplasty, LUCL repair
7	24	M	Y	N	112.5	RH fracture, LUCL rupture, MUCL rupture	RH arthroplasty, MCUL reconstruction, LUCL repair, brachialis repair
8	44	M	Y	N	17.5	RH fracture, MUCL rupture, LUCL rupture, coronoid fx	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid
9	19	M	N	N	109	RH fracture, MUCL rupture, ipsilateral scaphoid fracture, and trapeziometacarpal subluxation	RH arthroplasty, MUCL repair; ORIF scaphoid, thumb CMC volar ligament reconstruction
10	63	F	N	N	77	RH fracture, LUCL rupture, coronoid fracture	RH arthroplasty, ORIF coronoid fx, LUCL reconstruction
11	72	F	Y	N	66	RH fracture, LUCL rupture	RH arthroplasty, LUCL repair
12	87	F	Y	N	20	RH fracture, LUCL rupture, MUCL rupture, coronoid fracture	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid
13	66	F	Y	N	28	RH fracture, LUCL rupture, MUCL rupture, coronoid fracture	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid
14	42	M	N	N	165	RH fracture, MUCL rupture	RH arthroplasty, MUCL reconstruction
15	38	M	N	N	155	RH fracture, MUCL rupture	RH arthroplasty, MUCL reconstruction
16	35	M	Y	N	57	Failed conservative treatment: RH nonunion and elbow contracture	Capsulectomy and contracture release, RH arthroplasty
17	45	F	Y	N	53	Failed conservative treatment: RH fracture and MUCL rupture	RH arthroplasty, MUCL reconstruction
18	21	F	N	N	18	Revision surgery: elbow contracture, HO, status post-MUCL reconstruction	Arthroscopic HO excision and contracture release, RH arthroplasty
19	30	F	Y	Y	85	Failed ORIF RH and MUCL reconstruction	Excision of HO and contracture release, neurolysis, RH arthroplasty
20	53	M	Y	N	58.5	Synovitis, status post-ORIF radial head and proximal ulna	Excision of HO and contracture release, RH arthroplasty
21	46	M	N	N	101.5	Type IV Monteggia fracture dislocation	Revision ORIF ulna, RH arthroplasty
22	36	M	N	Y	152	Failed RH metallic prosthesis and instability (MCL attenuation)	Revision RH arthroplasty, MUCL reconstruction
23	45	F	Y	N	50.5	Failed RH metallic arthroplasty with severe elbow contracture	Revision RH arthroplasty, HO excision, and contracture release

F = female; M = male; Y = yes; N = no; fx = fracture; HO = heterotrophic ossification; LUCL = lateral ulnar collateral ligament; MUCL = medial ulnar collateral ligament; ORIF = open reduction internal fixation; RH = radial head; ROH = removal of hardware.

followup. We assessed degenerative changes (osteophytes, joint space narrowing), prosthesis alignment, deformation, fracture or fragmentation, or multiple cysts indicative of synovitis by using the criteria defined by Forster et al. [7].

Results

The mean extension and flexion obtained in our patients was 11° to 145° (range, 0°–30° of extension and 130°–150° of flexion; Table 2). Mean supination and pronation were 80° and 83°, respectively (range, 45°–90° of supination and 50°–90° of pronation). The mean DASH score was 11.8 (SD, 14.5; range, 0–56) and a mean MEPS score of 88.9 (SD, 14.8; range, 45–100). Four patients had either a DASH score greater than 25 ($n = 2$) or a MEPS score less than 75 ($n = 3$) with two of these patients having sustained subsequent ipsilateral elbow trauma and three having been a revision or delayed procedure.

All elbows were stable at the last followup visit throughout their arc of motion with no evidence of dislocation, posterolateral or posteromedial rotatory instability, or varus or valgus instability on physical examination or fluoroscopic evaluation. No patient reported radiocapitellar area pain. Final radiographic evaluation revealed a concentric reduction of all elbows (Fig. 3A–B). One prosthesis fractured at the neck (Patient 5). This patient had a MEPS score of 85, DASH score of 7.5, and a full ROM of the elbow despite the prosthesis fracture. The average Forster radiographic score was 5.5.

Eight patients were returned to the operating room. Five of the eight patients developed contractures necessitating either manipulation under anesthesia ($n = 1$) or arthroscopic contracture release ($n = 4$). Biopsies were sent on three patients for histologic analysis. No histologic signs of synovitis were noted. No patients demonstrated clinical or radiographic features of silicone synovitis, as reported by Morrey et al. [27]. Two of those requiring releases again returned to the operating room, one of which acquired a secondary superficial oxacillin-resistant *Staphylococcus aureus* infection, requiring irrigation and débridement before healing uneventfully, and one patient required operative fixation of a distal humerus fracture sustained 9 months after the index procedure. One patient whose initial injury was a Monteggia's fracture had symptomatic hardware removed from her proximal ulna. One patient who had revision surgery from a metallic head and severe contracture developed an ulnar neuropathy after a second injury to his elbow from a motor vehicle accident. He was treated with ulnar nerve transposition. Another patient who was initially treated for a terrible triad injury developed a delayed posterior interosseous nerve palsy years later unrelated to the elbow injury and was treated with tendon

transfers. None of the patients undergoing contracture release required downsizing of the radial head implants.

Discussion

Radial head prosthetic arthroplasty is indicated by comminuted fractures [33] but there is no consensus on optimal prosthetic design. Silastic prostheses are easily inserted and have favorable hardness and elastic modulus but are condemned on the basis of reports of prosthesis failure and silicone synovitis. We question whether those failures are attributable to the prosthesis and material or the indications and technique and have studied the outcomes of silastic prostheses combined with restoration of the primary elbow ligament stabilizers.

We acknowledge limitations of our study. First, our review of 23 patients cannot definitively answer the question of radial head prosthesis design owing to selection bias inherent in retrospective reviews, limited followup, and limited outcome measures (particularly the radiographic analysis). It is useful, however, in sharing data that can be used to compare the outcomes of more recent designs, particularly in light of increasing concerns of arthrosis, stiffness, and “overstuffing.” Second, our inclusion criteria were broad. It is possible different diagnoses and procedures would fare differently with the use of a silastic head. However, given the study size, we grouped them together. Third, physical examination and review of radiographs at final followup were performed by the treating surgeon as well and not by an independent blinded individual.

Our report of intermediate and long-term results suggests ligament reconstruction may minimize or avoid complications of prosthesis fragmentation and silicone synovitis. Despite reports of restoration of full motion, minimal symptoms, and return to preinjury level of function [19] (Table 3), silastic radial head arthroplasty has been condemned because of isolated case reports of silicone synovitis [20, 27, 38, 39, 42]. Close examination of these data, however, suggest that instability of the elbow resulting from disruption of the primary ligamentous constraints is a common denominator of all the reported failures. In the report of Morrey report, 17 patients underwent silastic arthroplasty for revision of failed treatment for fracture–dislocations of the elbow, including an Essex-Lopresti lesion. Treatment did not include ligament reconstruction [27]. Similarly, in the report of Mayhall et al., five symptomatic implants were all done for revision surgery, again without ligament repair or reconstruction [20]. Synovitis is also reported in a rheumatoid patient with instability resulting from attrition of the MCL by rheumatoid disease [42]. This failure to address instability is common throughout all the reports of silicone synovitis on

Table 2. Results of treatment

Patient number	Procedure	ROM extension–flexion (degrees)	ROM pronation–supination (degrees)	Forster radiographic score	DASH Score	MEPS	Reoperations
1	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid	20–135	85–85	9	15	85	Unrelated PIN palsy treated with tendon transfers
2	RH arthroplasty, MUCL repair, LUCL repair	5–130	90–50	2	0.93	100	Return to OR—arthroscopic radical capsulectomy; second return for I&D status postinfection
3	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid	5–145	85–85	4	15	85	Return to OR—contracture release
4	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid	5–140	75–85	2	5	85	
5	RH arthroplasty, ORIF proximal ulna	0–145	70/80	3	7.5	85	Return to OR—ROH of ulnar plate
6	RH arthroplasty, LUCL repair	10–135	80–80	7	2.5	100	
7	RH arthroplasty, MCUL reconstruction, LUCL repair, brachialis repair	10–145	80–80	6	7.5	100	
8	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid	0–145	85–85	6	0.83	100	
9	RH arthroplasty, MUCL repair; ORIF scaphoid, thumb CMC volar ligament reconstruction	0–145	85–85	5	7.5	100	
10	RH arthroplasty, ORIF coronoid fx, LUCL reconstruction	20–150	85–85	5	42.5	80	Return to OR—contracture release; second return for ORIF left distal humerus
11	RH arthroplasty, LUCL repair	5–145	80–90	4	3.25	100	
12	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid	35–135	85–85	6	15	85	
13	RH arthroplasty, MUCL reconstruction, LUCL repair, ORIF coronoid	25–130	70–80	7	20.7	80	
14	RH arthroplasty, MUCL reconstruction	10–145	85–85	6	0	100	Return to OR—contracture release
15	RH arthroplasty, MUCL reconstruction	20–145	85–85	4	0.833	100	Manipulation under anesthesia
16	Capsulectomy and contracture release, RH arthroplasty	0–145	85–85	3	0.75	100	
17	RH arthroplasty, MUCL reconstruction	0–145	85–85	3	2.5	100	
18	Arthroscopic HO excision and contracture release, RH arthroplasty	35–150	85–85	7	56	45	
19	Excision of HO and contracture release, neurolysis, RH arthroplasty	0–145	85–85	8	12	85	
20	Excision of HO and contracture release, RH arthroplasty	30–145	45–85	7	2.5	100	
21	Revision ORIF ulna, RH arthroplasty	5–145	70–85	6	2.5	100	

Table 2. continued

Patient number	Procedure	ROM extension–flexion (degrees)	ROM pronation–supination (degrees)	Forster radiographic score	DASH Score	MEPS	Reoperations
22	Revision RH arthroplasty, MUCL reconstruction	10–145	85–85	9	18	65	
23	Revision RH arthroplasty, HO excision and contracture release	5–140	85–85	8	33	65	Developed ulnar neuropathy after an MVA—treated with ulnar nerve transposition and contracture release

DASH = Disabilities of the Arm, Shoulder, and Hand; HO = heterotrophic ossification; LUCL = lateral ulnar collateral ligament; MEPS = Mayo Elbow Performance score; MUCL = medial ulnar collateral ligament MVA = motor vehicle accident; OR = operating room; ORIF = open reduction internal fixation; PIN = posterior interosseous nerve; RH = radial head; I&D = irrigation and débridement; ROH = removal of hardware.

Fig. 3A–B Example of AP and lateral views of a silastic arthroplasty (A) 18 months postoperatively showing a concentric reduction and good preservation of the radiocapitellar joint and (B) 165 months postoperatively from a different patient, again showing concentric reduction and good preservation of the radiocapitellar joint. Some “cold flow” deformation of the prosthesis is seen in late followup, but no fragmentation was seen.



which condemnation of the prosthesis is based. This leads us to ask if failures are attributable to the silicone prosthesis or the indications and manner in which it has been used.

Morrey and An demonstrated the importance of the MCL as the primary valgus restraint with the radial head being the secondary valgus stabilizer [24]. We believe the low elastic modulus and softness of the silastic make it unable to withstand the higher radiocapitellar loads that occur when the ligaments are not functional and that these increased forces lead to prosthesis fragmentation

and failure. However, our data suggest this complication may be preventable by reconstructing the primary restraint (MCL) at the time of arthroplasty, thus dramatically reducing the radiocapitellar load on the prosthesis [24]. This is pertinent information given the uncertainty about the optimal treatment for nonreconstructable radial head fractures. Simple excision is associated with proximal migration of the radius, wrist pain, grip weakness, and ulnohumeral arthrosis [2, 11, 15, 22]. Absence of the radial head also increases elbow instability [2].

Table 3. Summary of studies

Author	Number of patients	Procedure	Average followup time	Results	Prosthetic failure	Silicone synovitis	Revision
Morrey et al. [27]	17	Silastic radial head	6.7 years	12/17 (71%) satisfactory; 5/17 (29%) unsatisfactory	8/17 (47%)	Not specified	29%
Mackay et al. [19]	18	Silastic radial head	26 months	7/18 (39%) excellent; 10/18 (56%) good; 1/18 (5%) poor	2/18 (11%)	Not specified	1/18 (5%)
Mayhall et al. [20]	11 patients (12 prostheses)	Silastic radial head	Not specified; Case reports	Not specified	5/12(42%)	Not specified	3/12 (25%)
Herbertsson et al. [11]	61	Radial head excision	18 years	28 patients were symptoms free, 27 occasional pain and 6 with daily pain	N/A	N/A	N/A
Harrington et al. [10]	20	Metallic radial head arthroplasty	12.1 years	12 excellent; 4 good; 2 fair; 2 poor	N/A	N/A	
Grewal et al. [8]	26	Metallic radial head arthroplasty	24.5 months	Mean SF-36 score = 41.8; mean DASH = 24.4; mean MEPS = 83.4 with 50% excellent and 17% good	0	N/A	0
Popovic et al. [31]	51	Bipolar metallic arthroplasty	8.4 years	MEPS: 14 excellent, 25 good, 9 fair, 3 poor; 37 with progressive osteolysis	None	N/A	None
Ring and King [34]	27	Metallic radial head arthroplasty	40 months	MEPS: 13 excellent, 9 good, 3 fair, and 2 poor; Avg DASH = 17; Avg ASES instrument = 84	1 overstuffing	N/A	None
Hausman et al.	23 patients	Silastic radial head replacement with concomitant medial ligament repair or reconstruction	69.6 months	Avg DASH score 11.8; Avg MEPS 88.9; (12 excellent, 8 good, 2 fair, 1 poor)	1/23 (4%)	Not observed	No revisions

Avg = Average; DASH = Disabilities of the Arm, Shoulder, and Hand; MEPS = Mayo Elbow Performance Score; ASES = American Shoulder and Elbow Surgeons; N/A = not available.

Metal prosthetic arthroplasty, although currently favored, is not supported with long-term data to validate their use and reports of early radiocapitellar arthrosis are cause for concern [8, 10, 31, 34, 41].

A perfect replacement for the complex geometry and function of the radial head may not presently exist, and a retrospective review of 23 patients cannot definitively answer the question of radial head prosthesis. However, this is the largest series of silastic arthroplasties yet reported and the only one in which ligament dysfunction and elbow instability were concomitantly treated. Our data will be a useful context in which to evaluate functional outcomes and complication rates for metal prostheses, especially as further information about concerns of arthrosis, stiffness, and “overstuffing” with metal prostheses becomes available. The data also suggest the silastic radial head prosthesis may be used in a stable elbow or one rendered stable by ligament repair or reconstruction without complications of prosthesis fragmentation or silicone synovitis to yield good radiographic and functional results by standardized outcome instruments such as the DASH and MEPS.

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