

TABLE E-1. Patient characteristics. M=male, F=female, D=dominant, ND=non dominant, RA=rheumatoid arthritis, JRA=juvenile rheumatoid arthritis, PTA=posttraumatic arthritis, ORIF=open reduction and internal fixation, NIDDM=non-insulin-dependent diabetes mellitus, AF=atrial fibrillation, Prev ops = previous operations, PW = Pritchard-Walker, CM = Coonrad-Morrey, C-I = Coonrad-I, APC = allograft-prosthetic composite, U = ulna revision, B = both component revision, FU = follow-up, Y = years, ADLs = activities of daily living.

Case	Age	Sex	Side	Diagnosis	Confounding Factors	Prev Ops	Diagnosis	Prerevision Range of Motion (<i>deg</i>)			
								Flex.	Ext.	Pron.	Supin.
1	37	F	D	RA	Steroids, narcotics, osteoporosis	2	Aseptic ulnar loosening (GSB)	110	50	60	70
2	39	F	D	Failed ORIF	None	3	Ulna component fracture and proximal ulna periprosthetic fracture (PW)	130	5	90	-45
3	45	M	ND	PTA	None	2	Aseptic ulnar loosening (PW)	150	10	90	90
4	49	F	D	PT ankylosis	Nonunion	3	Ulna component fracture (C-I)	130	20	50	50
5	51	F	ND	RA	Steroids, brachial plexopathy	1	Aseptic ulnar loosening, fracture at ulna tip (CM)	90	0	80	70
6	55	F	D	RA	Steroids	4	Grossly worn bushings, proximal ulna resorption (PW)	140	15	70	70
7	58	M	ND	RA	Steroids	5	Aseptic ulnar loosening, ulna osteolysis (Swanson)	130	40	80	50
8	58	F	ND	JRA	Ulcerative colitis, steroids, cirrhosis	3	Aseptic ulnar loosening, fracture at ulna tip (CM)	130	30	70	90
9	59	M	D	PTA	Pericarditis, hepatitis	3	Aseptic ulnar loosening, osteolysis, fracture of ulna (CM)	135	0	70	70
10	61	F	ND	PTA	Hysterectomy\oophorectomy, asthma, steroids	3	Aseptic ulnar loosening and periprosthetic ulna fracture (CM)	40	5	90	90
11	72	F	ND	PTA	NIDDM, hypertension, obesity	3	Aseptic ulnar loosening, periprosthetic humeral fracture (CM)	110	45	90	90
12	67	F	ND	PTA	None	4	Aseptic ulnar loosening, massive humeral osteolysis (CM)	140	20	80	80
13	75	F	ND	RA	Hypertension, iron-def. anemia	3	Aseptic ulnar loosening, proximal ulna periprosthetic fracture (PW)	140	0	70	70
14	79	F	ND	PTA	Osteoporosis, AF, anemia	3	Aseptic ulnar loosening, osteolysis, humeral periprosthetic fracture (PW)	110	40	70	70
15	74	F	D	RA	Steroids, pemphigoid	2	Massive proximal ulna osteolysis, well fixed ulnar component (PW)	135	40	70	45
16	62	F	ND	RA	None	3	Massive humeral & ulnar loosening (PW)	110	40	60	60
17	42	F	D	JRA	None	2	Loose TEA, with humeral and ulna osteolysis (Triaxial)	135	20	80	80
18	56	F	ND	RA	None	7	Well-fixed ulnar component with comminuted periprosthetic tip fracture (C-I)	120	10	70	90
19	55	F	ND	RA	None	8	Aseptic ulnar loosening (CM)	105	20	60	90
20	66	F	D	RA	None	2	Aseptic humeral & ulnar loosening, periprosthetic tip fracture (London)	120	10	80	80
21	47	F	ND	JRA	Steroids	2	Aseptic humeral & ulnar loosening (PW)	130	20	90	90
22	39	M	ND	PTA	None	3	Aseptic humeral & ulnar loosening (London)	130	30	80	80
Av	57					3		121	21	75	70

Case	Pathology	Source of Graft	Procedure
1	Anteromedial ulna cortical defect	Femur	Corticocancellous (containment) (B)
2	Anterior, medial, and lateral cortical defects, bushing wear	Fibula	Cortical med. and post. struts (structural) (U)
3	Anteromedial defect	Iliac + Rib	Corticocancellous (containment) (B)
4	Anterior 3-cm defect, bushing wear	Rib	Rib (containment) (U)
5	Ulna tip fracture and olecranon fracture	Fibula	Cortical struts (structural) (U)
6	Significant proximal anterior osteolysis, small lateral violation	Femur	Cortical struts (structural and containment), reinsertion of original component (U)
7	Anterior defect, ulna tip eroded subcutaneous border	Ulna	Cortical struts (structural) (B)
8	Ulna tip fracture, anterior defect, bushing wear	Fibula	Cortical struts (structural) (U)
9	4 cm of proximal ulna missing	Fibula (APC)+Femur	Structural ant. and post. struts, post. proximal extension for triceps attachment (U)
10	Ulna tip fracture, olecranon fracture	Fibula	Ant. and post. struts at site of periprosthetic fracture (structural) (U)
11	Lateral defect of ulna	Humerus	Structural (B)
12	Lateral defect, periprosthetic fracture at ulna tip	Ulna	Containment and structural (B)
13	Destroyed anterior ulna cortex, both components grossly loose	Humerus	Structural and containment (B)
14	Fibrous triceps, olecranon nonunion, anterior, lateral, medial ulna loss	Humerus	Structural, containment, proximal extension for triceps attachment (B)
15	Osteolysis anteromedial to the length of the ulna component	Rib	Split rib struts placed ant. and posteromed. (containment) (U)
16	Resorbed distal humerus, loose ulnar component, anterior ulna eroded	Humerus	Major humeral reconstruction, Cortical ant. strut (B)
17	Coronoid and anterolateral erosion, olecranon eroded	Fibula	Structural (*2) cortical struts (B)
18	Proximal ulna osteolysis with 5 cm of proximal ulna missing	Fibula	Structural, with post., med., lat. struts. (U)
19	3-surface cortical deficiencies	Fibula, femoral head	Structural (ant., lat., post. struts) and impaction grafting (U)
20	Proximal 4 cm of ulna resorbed, periprosthetic fractures of ulna and humerus	Humerus	Structural (ant., post.) ulna, (ant., post.) humerus (B)
21	Coronoid and anterior ulna erosion	Humerus	Structural ulna (ant.), humerus (ant., post.) (B)
22	Proximal ulna resorption, proximal canal expansion	Femur	Structural ulna (post.) proximal extension for triceps attachment, impaction grafting (B)

Case	Complications and Additional Surgery	FU (Y)	FU Motion (<i>deg</i>)				MEPS Score (Preop.\Postop.) (<i>points</i>)					% Improvement
			Flex.	Ext.	Pron.	Supin.	Pain	Stability	Motion	ADLs	Total	
1	Ulnar component loosening (3y) revised with impaction grafting and strut	5	65	30	40	20	0\15	0\5	15\5	10\5	25\30	20
2	Wound breakdown 10d postop.	8	150	60	90	90	0\30	0\10	20\15	20\25	40\80	100
3	None	11	120	0	60	30	0\15	0\5	20\20	10\20	30\60	100
4	None	2	135	0	90	60	15\15	0\5	20\20	10\25	45\65	44
5	Humeral periprosthetic fracture – revised with struts	4	150	0	90	90	0\15	0\10	15\20	0\5	15\50	233
6	Excision of discharging sinus, no deep infection found, stitch abscess	2	140	0	30	60	15\30	0\5	20\15	5\25	40\75	87
7	Triceps detachment (9mo), Rx – anconeus rotation flap reconstruction	2	150	0	30	30	30\45	0\10	15\20	10\20	55\95	72
8	None	3	150	15	90	60	0\45	0\10	15\20	0\25	15\100	566
9*	Deep infection, allograft removed and infection controlled											
10	Periprosthetic ulna fracture (2y) treated with revision plus struts	2	130	30	90	90	15\30	0\10	5\15	0\20	20\75	275
11	None	3	150	15	90	90	0\30	0\10	15\20	0\25	15\85	466
12	Radial border osteolysis (6y), anterolateral and lateral struts	8	140	60	60	30	0\30	5\10	20\15	10\25	35\80	128
13	None	2	150	15	90	90	0\30	0\10	20\15	15\25	35\85	142
14	None	3	120	0	30	30	0\30	0\10	15\20	0\15	15\75	400
15	None	2	130	30	70	50	15\30	0\5	15\20	10\15	40\70	75
16	None	2	140	5	75	35	0\45	0\5	15\20	5\25	20\95	375
17	None	3	140	10	75	75	15\45	0\5	20\20	10\25	45\95	111
18	None	10	130	10	80	80	15\30	0\5	20\20	0\20	35\75	114
19	None	6	150	30	60	90	15\45	0\5	15\20	15\25	45\95	111
20	Ulnar nerve neurapraxia (recovered 9mo)	3	150	0	90	90	15\45	0\5	20\20	5\25	40\95	137
21	Sinus débridement (2) and humeral revision 8y post-revision	9	140	30	90	90	15\45	0\5	20\20	10\25	45\95	111
22	None	5	150	30	90	90	15\30	5\10	20\20	15\25	55\85	54
Av		4	137	18	72	65	9\32	0\7	17\18	8\21	34\79	132

*Data for FU, FU Motion, MEPS Score, and % Improvement are not given for this case because the implant was removed.