

TABLE E-1 Distribution of Injury Types

Injury	No.	%
Isolated olecranon fracture	70	54
Monteggia fracture-dislocation	19	15
Transolecranon fracture-dislocation	9	7
Coronoid and radial head fractures with instability ("terrible triad")	7	5
Isolated radial head fracture	8	6
Elbow dislocation and radial head fracture	2	1.5
Elbow dislocation and coronoid fracture	2	1.5
Olecranon and radial head fractures	2	1.5
Injuries with associated distal humeral fracture	10	8
Total	130	100

TABLE E-2 Fracture Sites and Types

Fracture	No.
Olecranon fractures	93
Mayo I (nondisplaced)	1
Mayo II (displaced without joint instability)	78
Mayo III (displaced with associated instability)	14
Radial head and/or neck fractures	31
Mason I (marginal nondisplaced)	4
Mason II (marginal displaced)	14
Mason III (comminuted)	13
Coronoid fractures	16
Regan-Morrey I (tip)	7
Regan-Morrey II (half of the coronoid)	6
Regan-Morrey III (more than half of the coronoid)	3
Distal humeral fractures*	10
AO/ASIF A (extra-articular)	2
AO/ASIF B (partial intra-articular)	4
AO/ASIF C (complete intra-articular)	4

*AO/ASIF = Arbeitsgemeinschaft für Osteosynthese/Association for the Study of Internal Fixation.

TABLE E-3 Surgical Treatment of Fractured or Osteotomized Bones and Injured Ligaments

	Method of Fixation	No.
Proximal ulna or olecranon fractures or osteotomies	Plate	85
	Tension band	19
	Intramedullary screw	7
Radial head fractures	Screw fixation	15
	Radial head replacement	11
	Radial head excision	2
	Not addressed surgically	3
Coronoid fractures	Screws and wires	10
	Radial head autograft	1
	Not addressed surgically	5
Distal humeral fractures	Two parallel plates	4
	One plate	4
	Screw fixation	1
	Not addressed surgically	1
Lateral collateral ligament repairs		13
Medial collateral ligament repairs		2
Medial collateral ligament reconstruction (tendon allograft)		1

TABLE E-4 Heterotopic Ossification Location

Location	No.*	%†
Collateral ligaments	16	37
Medial collateral ligament	11	23
Lateral collateral ligament	2	4
Both collateral ligaments	3	6
Posterior aspect of ulna	14	29
Proximal aspect of radius (anterolateral)	13	27
Distal aspect of humerus	10	20
Anterior	2	4
Posterior	2	4
Anterolateral	1	2
Posteromedial	2	4
Medial	1	2
Anterior and posterior	1	2
Circumferential	1	2
Ulnohumeral	8	16
Radiohumeral	5	10
Proximal radioulnar	1	2

*Number of patients presenting with heterotopic ossification at the specified location. †Percentage of the total number of patients with heterotopic ossification.

TABLE E-5 Radiographic and Clinical Severity of Heterotopic Ossification (HO) in the Most Frequent Fracture Patterns

Fracture	HO* (no. [%])	Radiographic Severity (no.)			Bone Bridge	Clinical Severity† (no.)		
		Hazy Immature	Mature Limited	Mature Extensive		Mild	Moderate	Severe
Monteggia fracture-dislocation (19)	4 (21%)	3	—	—	1	1	2	1
Isolated radial head fracture (8)	2 (25%)	2	—	—	—	2	—	—
Isolated olecranon fracture (70)	19 (27%)	12	6	—	1	14	4	1
Transolecranon fracture-dislocation (9)	6 (67%)	1	4	1	—	2	4	—
Terrible triad (7)	5 (71%)	2	3	—	—	1	3	1
Injuries with associated distal humeral fracture (10)	8 (73%)	1	3	4	—	2	6	—

*The value in parentheses represents the percentage of elbows with the specified injury type that developed HO. †Graded according to loss of motion: mild, <30°; moderate, ≥30° but no ankylosis; severe, ankylosis.

TABLE E-6 Univariate Analysis

Variable*	Heterotopic Ossification		P Value
	No, N = 82	Yes, N = 48	
Male sex†	34 (41%)	31 (65%)	0.011
ISS‡	4 (IQR, 4-9)	9 (IQR, 4-10)	0.03
Chest AIS ≥3†	1 (1%)	7 (15%)	0.002
ARDS/respiratory failure†	1 (1%)	4 (8%)	0.04
Open fracture†	6 (7%)	12 (25%)	0.005
Elbow instability†	4 (5%)	18 (37%)	<0.001
Coronoid fracture†	5 (6%)	11 (23%)	0.005
Distal humeral fracture†	3 (4%)	7 (15%)	0.024
Radial neck fracture†	9 (11%)	12 (25%)	0.036
Fracture in same limb†	9 (11%)	16 (33%)	0.002
Days from injury to definitive surgery‡	4 (IQR, 2-6)	5 (IQR, 4-7)	0.021
No. of surgeries ≥2†	1 (1%)	10 (21%)	0.001
Age‡ (yr)	57 (IQR, 41-75)	53 (IQR, 43-62)	0.20
Head AIS ≥2†	7 (8%)	6 (12%)	0.46
Spine AIS ≥2†	3 (4%)	6 (12%)	0.055
Superficial approach	—	—	0.12
Deep approach	—	—	0.061
Radial head or neck fracture†	17 (21%)	14 (29%)	0.28
Mechanical hardware failure†	2 (2%)	4 (8%)	0.12
Deep infection†	1 (1%)	0 (0%)	1
Wound complications†	3 (4%)	5 (10%)	0.12
Residual instability†	1 (1%)	3 (6%)	0.10
Nonunion†	2 (2%)	3 (6%)	0.28

*ISS = Injury Severity Score, AIS = Abbreviated Injury Score, and ARDS = acute respiratory distress syndrome. †The value is given as the number of patients, with the percentage in parentheses. ‡The value is given as the median, with the interquartile range (IQR) in parentheses.

TABLE E-7 Prognostic Model Showing the Predicted Probability, Relative Risk (RR), and Odds Ratio (OR) for Heterotopic Ossification (HO)*

Instability	Chest AIS	Open Fracture	Definitive Surgery	Probability of HO	RR	OR
No	<3	No	First 24 hr	13%	1.0 (ref.)	1.0 (ref.)
			After	26%	2.0	2.4
		Yes	First 24 hr	34%	2.8	4.2
			After	56%	4.5	10.6
	≥3	No	First 24 hr	56%	4.5	9.0
			After	76%	6.1	22.3
		Yes	First 24 hr	83%	6.6	38.5
			After	92%	7.3	95.5
Yes	<3	No	First 24 hr	57%	4.5	10.1
			After	76%	6.1	25.0
		Yes	First 24 hr	83%	6.6	43.2
			After	92%	7.3	107.1
	≥3	No	First 24 hr	92%	7.3	91.1
			After	97%	7.7	225.8
		Yes	First 24 hr	98%	7.8	389.6
			After	99%	7.9	965.5

*The variables and their values are taken from the best prognostic model obtained by logistic regression analysis.