

12 Appendices

12.1 Demographics

Gender	Female	24 (51%)
	Male	23 (49%)
Side	Left	24 (51%)
	Right	23 (49%)
Mechanism	Sport	24 (51%)
	Playground	11 (23%)
	Home	8 (18%)
	Wheel	3 (6%)
	Other	1 (2%)

Group (n= number)	Mean age years,months (range)
Total (n=47)	7,10 (2,3-12,5)
Cast (n=30)	6,10 (2,3-12,5)
Closed reduction and cast mean (n=6)	10,2 (7,9-11,10)
Percutaneous reduction (n=6)	9,10 (7,6-11,8)
Open reduction (n=5)*	8,7 (5,9-12,2)
Judet 1 (n=31)	6,11 (2,3-12,5)
Judet 2 (n=3)	8,1 (2,5-11,4)
Judet 3 (n=7)	10,0 (7,6-11,9)
Judet 4a (n=2)	11,3 (10,8-11,10)
Judet 4b (n=4)	9,3 (8,0-11,8)

* Mean age of all operative techniques = 9,6

12.2 Gender

12.2.1 Female (n=24)

	Subject	Number (n)
Complications	Infection	-
	Cast	2*
	Pin	1
	Secondary dislocation	-
Radiological Outcome	Ectopic calcification	1
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Functional Outcome	Pain	-
	Neurovascular injury	-
	Range of Motion restriction	14 = None 6 = Minor (10° or less) 3 = Moderate (between 11°-20°) 1 = Severe (>20°)
Fracture Classification	Judet 1	13
	Judet 2	2
	Judet 3	4
	Judet 4 a	1
	Judet 4 b	4
Treatment Method	Cast only	13
	Closed reduction and cast	3
	Percutaneous reduction	5
	Open reduction	3
Immobilisation time (days)	Mean	21.0 (10-42)
Concomitant fracture	Number	9 (37.5%)
	Type	- 3 x Judet 1 + 21u-M/2.1

		<ul style="list-style-type: none"> - 1 x Judet 1 + 21u-M/3.1 - 1x Judet 1 + 22u-D/2.1/21u-M/2.1 - 1x Judet 1 +13M/7m - 1 x Judet 2 + 21u-M/3.1 - 1x Judet 4a + 21u-M/3.1 - 1x Judet 4b + 21u-M/3.1
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*1 erythema, 1 pain

12.2.2 Male (n=23)

	Subject	Number (n)
Complication	Infection	-
	Cast	1
	Pin	-
	Secondary dislocation	-
Radiological Outcome	Ectopic calcification	-
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Functional Outcome	Pain	-
	Neurovascular injury	1*
	Range of Motion restriction	15 = None 5 = Minor (10° or less) 2 = Moderate (11°-20°) 1 = Severe (>20°)
Classification of the Fracture	Judet 1	18
	Judet 2	1
	Judet 3	3
	Judet 4 a	1
	Judet 4 b	-
Treatment Method	Cast only	17
	Closed reduction and cast	3
	Percutaneous reduction	1
	Open reduction	2
Immobilisation time (days)	Mean overall	18.25 (7-30)
Concomitant fracture	Number	4 (17.5%)
	Type	<ul style="list-style-type: none"> - 3 x Judet 1 + 21u-M/3.1 - 1 x Judet 1 + 21u-M/2.1

*(hypoesthesia in radial nerve)

12.3 Judet's classification

12.3.1 Judet 1 (n=31)

	Subject	Number (n)
Gender	Female	13
	Male	18
Age	Mean years,months (range)	6,11 (2,3-12,6)
Treatment method	Cast only	27
	Closed reduction and Cast	-
	ESIN	-
	Open reduction	4*
Immobilisation time (days)	Overall mean	18,25 (7-30)
	Judet 1 with concomitant fracture (n=9)	25
	Judet 1 without concomitant fracture (n=22)	17
Complication	Infection	-
	Cast	2
	Pin	-

	Secondary dislocation	-
Functional outcome	Pain	-
	Neurovascular problems	-
	Range of motion restriction	20 = None 7 = Minor (10° or less) 3 = Moderate (11°-20°) 1 = Severe (>20°)
Radiological Outcome	Ectopic calcification	-
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Associated fractures	Number	9 (29%)
	Type of fracture	- 21u-M/3.1 (n=4) - 21u-M/2.1 (n=3) - 22u-D/2.1/21u-M/2.1(n=1) - 13M/7m (n=1)

*for concomitant fractures only (olecranon (n=3), epitrochlear (n=1))

12.3.2 Judet 1 with associated fractures

Associated Fracture	Immobilisation time (days)
21u-M/2.1 (n=3)	18
21u-M/3.1 (n=4)	21.5
21u-M/2.1 / 22u-D/2.1 (n=1)	28
13 M/ 7m (n=1)	28

12.3.3 Judet 2 (n=3)

	Subject	Number
Gender	Male	2
	Female	1
Age	Mean years,months (range)	8,1 (2,5-11,4)
Treatment method	Cast only	2
	Closed reduction and Cast	1
Immobilisation time (days)	Overall mean	26 (15-42)
	Judet 2 with concomitant fracture (n=1)	42
	Judet 2 without concomitant fracture (n=2)	21.5
Complications	Infection	-
	Cast	1
	Pin	-
	Secondary dislocation	-
Functional Outcome	Pain	-
	Neurovascular Problems	-
	Range of motion restriction	2 = None 1 = Minor (10° or less) 0 = Moderate (11°-20°) 0 = Severe (>20°)
Radiological Outcome	Ectopic calcification	-
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Concomitant fracture	Number	1 (33%)
	Type	1 x Judet 2 + 21u-M/3.1

12.3.4 Judet 3 (n=7)

	Subject	Number
Gender	Male	3
	Female	4
Age	Mean years,months (range)	10,0 (7,6-11,9)

Treatment method	Cast	1*
	Closed reduction and Cast	2
	ESIN	4**
Immobilisation time (days)	Overall mean	20.57 (14-42)
	Judet 3 with concomitant fracture (n=1)	35
	Judet 3 without concomitant fracture (n=6)	18,1
Complications	Infection	-
	Cast	-
	Pin	-
	Secondary dislocation	-
Functional Outcome	Pain	-
	Neurovascular Problems	1***
	Range of motion restriction	5 = None 2 = Minor (10° or less) 0 = Moderate (11°-20°) 0 = Severe (>20°)
Radiological Outcome	Ectopic calcification	-
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Concomitant fracture	Number	1 (14.5%)
	Type	1 x Judet 3 + 21u-M/2.1

* Patient aged 11y9m

** out of 4, in 1 case Joy stick technique was used (K-wire leverage)

*** hypoesthesia of the radial nerve

12.3.5 Judet 4 (n=6)

	Subject	Number
Gender	Male	1
	Female	5
Type	Judet 4a	2
	Judet 4b	4
Age	Mean years,months (range)	10,0 (8,0-11,10)
Treatment method	Cast	-
	Closed reduction and Cast	3
	ESIN	2*
	Open reduction	1
Immobilisation time (days)	Overall mean	24 (14-28)
	Judet 4 with concomitant fracture (n=2)	28
	Judet 4 without concomitant fracture (n=4)	22
Complications	Infection	-
	Cast	-
	Pin	-
	Secondary dislocation	-
Functional Outcome	Pain	1
	Neurovascular problems	-
	Range of motion restriction	2 = None 2 = Minor (10° or less) 1 = Moderate (11°-20°) 1 = Severe (>20°)
Radiological Outcome	Ectopic calcification	1**
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Concomitant fracture	Number	2 (33.3%)
	Type	2 x Judet 4 + 21u-M/3.1

*in both cases Joy stick technique was used (K-wire leverage)

**Judet 4b, 11y8m

12.4 Treatment method

12.4.1 Cast only (n=30)

	Subject	Number
Gender	Male	17
	Female	13
Age	Mean years, months (range)	6,10 (2,3-12,5)
Classification of the Fracture	Judet 1	27
	Judet 2	2
	Judet 3	1
	Judet 4 a	-
	Judet 4 b	-
Immobilisation time	Mean (days)	18,46 (7-30)
Complications	Infection	-
	Cast	2*
	Secondary dislocation	-
Functional Outcome	Pain	-
	Neurovascular Problems	-
	Range of motion restriction	19 = None 6 = Minor (10° or less) 4 = Moderate (11°-20°) 1 = Severe (>20°)
Radiological Outcome	Ectopic calcification	-
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Concomitant fracture	Number	6 (20%)
	Type	- 3 x Judet 1 + 21u-M/2.1 - 1 x Judet 1 + 21u-M/3.1 - 1 x Judet 2 + 21u-M/3.1 - 1x Judet 1 + 22u-D/2.1/21u-M/2.1

*1 erythema, 1 pain

12.4.2 Closed reduction and Cast (n=6)

	Subject	Number
Gender	Male	3
	Female	3
Age	Mean years, months (range)	10,2 (7,9-11,10)
Classification of the Fracture	Judet 1	-
	Judet 2	1
	Judet 3	2
	Judet 4 a	2
	Judet 4 b	1
Immobilisation time	Mean (days)	18,66 (13-28)
Complications	Infection	-
	Cast	-
	Secondary dislocation	-
Functional Outcome	Pain	-
	Neurovascular Problems	-
	Range of motion restriction	3 = None 3 = Minor (10° or less) 0 = Moderate (11°-20°) 0 = Severe (>20°)
Radiological Outcome	Ectopic calcification	-
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-

Concomitant fracture	Number	1 (16%)
	Type	1 x Judet 4a + 21u-M/3.1

12.4.3 Percutaneous ESIN (n=6)

	Subject	Number
Gender	Male	1
	Female	5
Age	Mean years, months (range)	9,10 (7,6-11,8)
Classification of the Fracture	Judet 1	-
	Judet 2	-
	Judet 3	4
	Judet 4 a	-
	Judet 4 b	2
Immobilisation time	Mean (days)	24.5 (15-35)
Complications	Infection	-
	Cast	-
	Pin	-
	Secondary Dislocation	-
Functional Outcome	Pain	-
	Neurovascular Problems	1*
	Range of motion restriction	5 = None 0 = Minor (10° or less) 0 = Moderate (11°-20°) 1 = Severe (>20°)
Radiological Outcome	Ectopic calcification	1
	Growth arrest	-
	Residual angulation	-
	Radial head necrosis	-
Concomitant fracture	Number	2 (30%)
	Type	1 x Judet 3 +21u-M/2.1 1 x Judet 4b + 21u-M/3.1

*hypoesthesia of the radial nerve

12.5 Guidelines HEL

12. Fractures tête et col radial

Rx coude face/profil

Il s'agit souvent de fractures en motte de beurre au niveau du col ou alors de fractures selon SH II ou IV au niveau de la tête radiale

TABLE 13-3 Judet Classification of Radial Neck Fractures

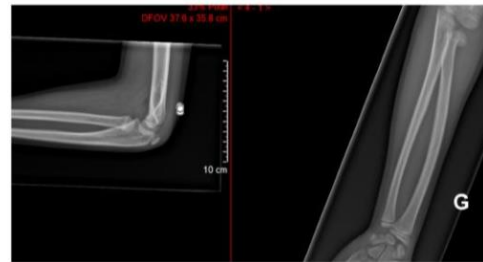
Type I	Nondisplaced
Type II	<30-degree angulation
Type III	30-60-degree angulation
Type IVa	60-80-degree angulation
Type IVb	>80-degree angulation

Traitement conservateur

- <10 ans:
Angulation <45°
Déplacement < 2mm
- >10 ans:
Angulation <30°
Déplacement < 2mm
- Pour les deux
- BAB 2 semaines puis mobilisation précoce si déplacement minime. En cas de déplacement plus important le BAB sera maintenu pour 3 semaines au maximum.
- Rx de contrôle à 1,2 semaines en polyclinique
- Arrêt sport 8 sem
- Fractures motte de beurre
BAB en softcast ou bretelle pendant 10 jours
Rx de contrôle: non
Arrêt sport 3 sec
Premier contrôle pour ablation plâtre en polyclinique ensuite chez pédiatre

Traitement chirurgical

- Fractures ouvertes
- Fractures avec déplacement > 2mm
- Fractures avec angulation >30° (>10 ans) et >45° (<10 ans)
- Le traitement sera réduction fermée et +/- ECMES



Merckaert Sophie, Fractures, entorses et luxations en pédiatrie : prise en charge aux urgences.
Guidelines de l'HEL CHUV, Unité pédiatrique d'orthopédie et traumatologie
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