

Wrist centralization using uniplanar external fixator and ulno-carpo-metacarpal intramedullary pin in radial club hand deformities: mid-term outcomes.

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Introduction

- Aplasia or hypoplasia of the radius
- 1/30,000 births affected
- often associated with a syndrome (VACTERL, Fanconi, Holt-Oram...)
- Bayne Classification I to IV
- Many treatments of the RCH are described in the literature



Purpose : To evaluate the medium-term outcomes of the technique of distraction by uniplanar external fixator followed by centralization by an intra-medullar pin.

Bayne LG, Klug MS. Long-term review of the surgical treatment of radial deficiencies. J Hand Surg Am 1987;12:169-79.

Methods

Retrospective charts review monocentric from 1994 to 2016

Distraction used first: Kessler 1989



Assessment

- X-ray evaluation of the correction of the deformity
- Surgical revision



Total deviation



Wrist deviation



Ulna deviation

Damore E, Kozin SH, Thoder JJ, Porter S. The recurrence of deformity after surgical centralization for radial clubhand. *J Hand Surg Am* 2000;25:745-51.

Manske PR, McCarroll HR Jr, Swanson K. Centralization of the radial club hand: an ulnar surgical approach. *J Hand Surg Am* 1981;6:423-33.

Serie

- 30 radial club hand (27 patients with bilateral RCH)
- Deformity (Bayne classification):
 - 3 type 2
 - 2 type 3
 - 25 type 4
- Syndromic association: 9

- Mean age at the first surgery: 26 months (SD 23.4)
- Mean follow-up: 6,67 years (SD 2.01)
- Mean age at the last follow-up: 9,23 years (SD 5.40)

- Mean time of distraction: 51 days (SD 47,04)

X ray results

Face		Pre operative mean	Standard deviation	Post-operative mean	Standard deviation	P Value
	Total deviation (degrees)	64	24,02	23	26,81	p<0,0000001
	Wirst deviation (degrees)	26	46,09	10,89	28,3	P<0,000001
	Ulnar deviation (degrees)	27,09	19,49	10,74	13,86	P<0,00001
	Frontal translation (mm)	14,65	5,66	6,76	7,15	P<0,0000001
Profile						
	Saggital translation (mm)	5,8	4,52	2,09	3,61	P<0,0000001

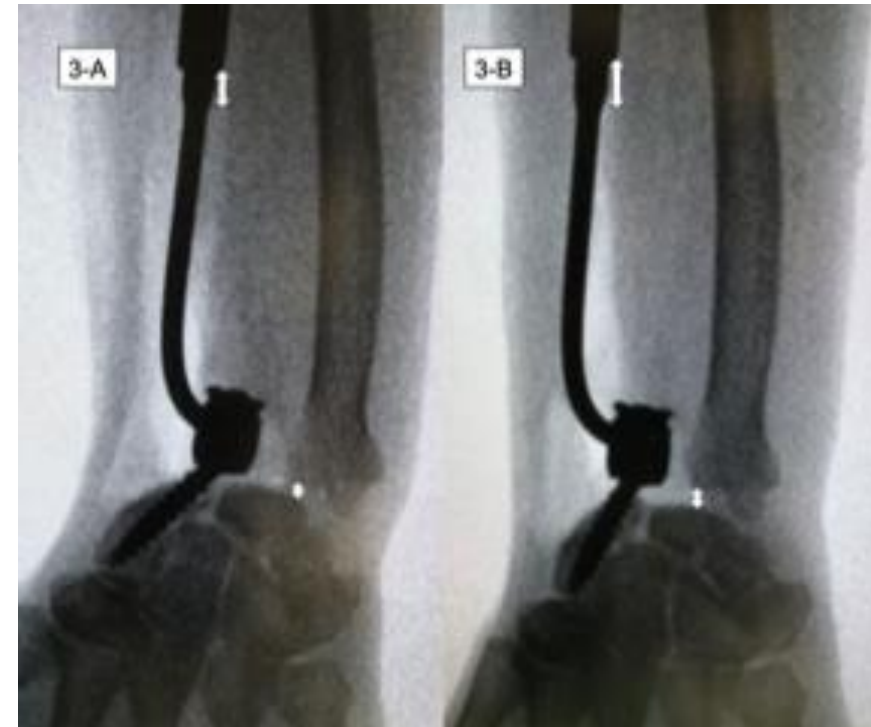
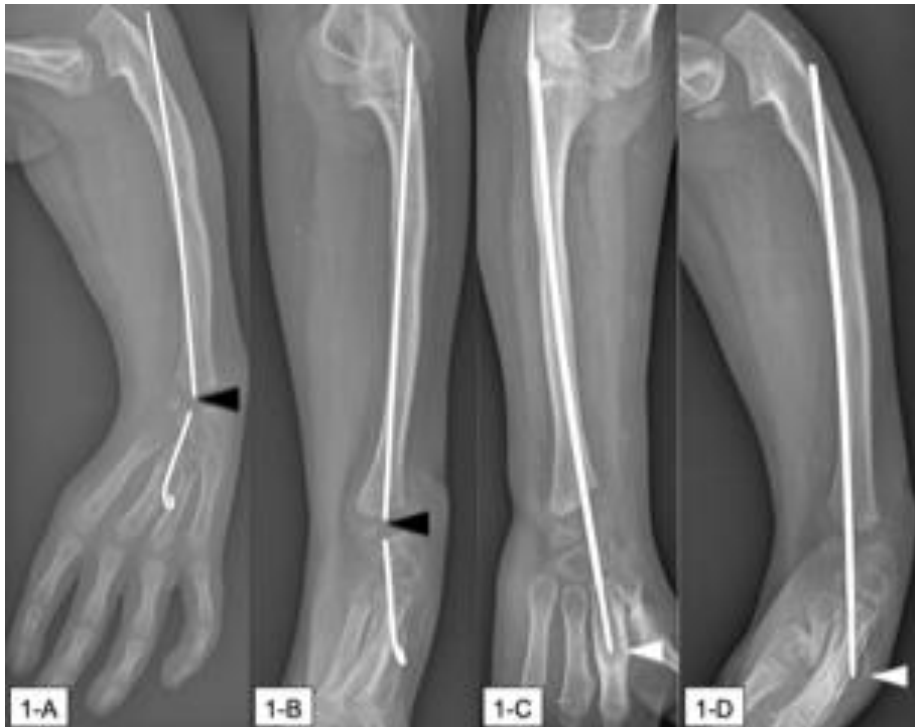
Surgical revisions

	Patient number(n)	Delay (months) *		
		mean	Standard deviation	
Pin replacement				
First replacement	21	17,14	16,89	
Second replacement	12	22,92	13,53	
Third replacement	8	35,25	21,25	
Fourth replacement	5	38	17,71	
Fifth replacement	4	44,75	17,78	
Sixth replacement	2	64	7,07	
Seventh replacement	1	73		
Secondary ulnar osteotomy				
First	12	12,58	10,88	
Second	3	29	9,64	
Third	2	36	15,56	
Fourth	1	59		

* Relatively to the first surgery

Discussion

- External concavity fixator exerts a distracting force -> satisfactory correction of angulation and translation
- Results equivalent to other recent clinical series
- Complication: recovery for hardware migration due to growth
- Need to think of a material that follows ulnar growth



Conclusion

- This is one of the largest series in the literature with a unique technique described by **Dr. Romana**.
- With **an average age at last follow-up of more than 9 years** (SD 5.40), an average correction of 43.85 degrees (SD 42.81) is observed but a wrist stabilization is mandatory
- The most common complication is the migration of the centralization pin
- A technological advance on equipment would limit this complication while maintaining stability with growth.

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