Clinical and ultrasonographical follow-up after standard removal of distal radius volar plates positioned distal to the watershed line

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Why standard plate removal?

- Flexor tendinopathy after VLP can be asymptomatic untill (too) late
- FPL is most at risk
- Loss of volar tilt, increased wrist extension, and higher Soong grade plate position result in greater contact between FPL tendon and plate

Wurtel et al., JHS Am 2017

- Marginal DR fractures require VLP distal to the watershed line

Goorens et al, JHS As 2017, Kachooei et al, J Wrst Surg 2016

> Flexor tendinopathy/rupture is preventable by early standard plate removal for VLP positioned distal to the watershed line

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Study design

- Prospective single-centre study
- 2013-2017
- >1 year follow-up
- Hardware removal for prominent plate (Soong Gr I-II)

Exclusion criteria

- Subsequent surgery
- Contralateral side surgery
- Non-anatomical reduction
- Dorsal, K-wire fixation
- Soong Gr 0
- Major complication at initial surgery (CRPS, Infection)
- Patient refusal/inability

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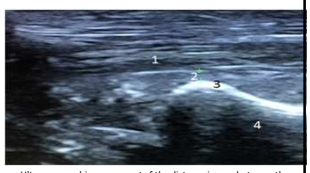
Demographics

2013-2017: 34 patients

20 patients

Clinical outcome

- ROM
- Grip strength
- QuickDash
- Custom Questionnaire (PROM)



Ultrasonographic assessment of the distance in mm between the FPL and the most volar prominence of the plate. 1: FPL; 2: distance between FPL and volar prominence (measured in between the two crosses); 3: volar prominence; 4: radius

Ultrasound

- Proximity Flexor pollicis longus (FPL) to volar rim
- PQ diameter

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Demographics

Patients	20
Age, mean (min-max) years	60 (39-84)
Sex Male/Female %	20/80
Side Right/Left %	20/80
Time to assessment (min-max) years	2,94 (1,01-5,02)
Time osteosynthesis to removal (min-max) months	10,8 (4-84)
Plate prominence	
0	0
1	7 (35%)
2	13 (65%)

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Clinical outcome

ROM, mean (min-max)	Affected side	Contralateral	P*
Flexion	53,5 (40-80)	64,25 (40-80)	**0,004**
Extension	62,05 (34-80)	68,75 (40-90)	**0,039**
Pronation	85,5 (0-90)	85,25 (0-90)	0,330
Supination	85,1 (0-90)	85 (0-90)	0,330
Radial deviation	22,1 (10-40)	25 (10-35)	**0,015**
Ulnar deviation	32,5 (10-50)	36 (20-50)	0,149
Grip strength, mean (min – max) (N)	25,65 (10-50)	26,75 (12-60)	0,212
Quick Dash, mean (min-max)		21,7 (0 – 73)	

* Paired sample t-Test. CI 95%

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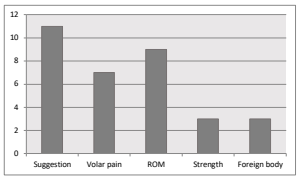
PROM

- 85% good to excellent
- ROM: 60%↑, 30%↓, 10% =
- Grip strength: 45%↑, 10%↓, 45%=
- Redo? 80%



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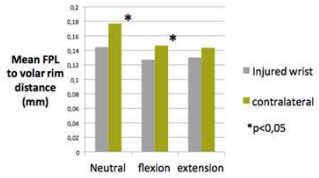
Ultrasound

FPL distance to volar rim



PQ diameter

Affected side (mm)	Contralateral (mm)	P*
0,36 (0,12-0,5)	0,40 (0,2-0,73)	0,188

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Complications

- 1 CRPS
- No refractures

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Discussion

- Safe procedure
- High patient satisfaction of 80%
- Only 60% has ROM↑ Only 45% has grip strength↑
- FPL distance to volar rim↑ but not to normalization as contralateral

> Rationale of routine plate removal has to be thoroughly discussed preoperatively with the patient to avoid wrong expectations

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Shortcomings

- Small sample size
- Absence preoperative data of function/ultrasound
- No interobserver data / single surgeon aspect

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Conclusions

- Flexor tendinopathy after VLP is a preventable complication
- Early standard plate removal in Soong 1 1 (1)

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