


PIP Stiffness

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11th Southampton Hand Course
for Therapists and Surgeons
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www.handsurgery.co.uk

UNIVERSITY OF Southampton School of Medicine
University Hospital Southampton NHS Foundation Trust

Summary

- ☞ Causes
- ☞ Management



Causes of PIP stiffness

- ☞ Injured posture
 - PIP flexed
 - MP extended
- ☞ Joint pathology
 - Intra-articular injury
 - Palmar plate injury
 - Joint pain
 - Arthritis
- ☞ Tendon Pathology
 - Extensor tendon adhesion
 - Fracture
 - Surgery
 - Tendon imbalance
 - Boutonniere
 - Swan neck
 - Flexor tendon adhesion
- ☞ Other pathology
 - Dupuytren's
 - Scleroderma




Rha ,CP, OA, DD



Scleroderma
Psoriasis
Secretans


Causes of PIPJ Stiffness *Iatrogenic*

- ☞ Poor splintage
- ☞ Inadequate instructions to Therapist
- ☞ Ham-fisted surgery
- ☞ Large metal plates
- ☞ Poorly positioned k-wires or external fixator pins




Management

- ☞ Avoidance
- ☞ Flexion contracture
- ☞ Extension contracture
- ☞ Joint Incongruency or pain
- ☞ Tendon adhesion



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Avoidance of PIP stiffness

- ☞ Anatomical restoration of joint
 - Dislocations
 - Fracture fragments
- ☞ Secure fixation of fractures
- ☞ Early mobilisation
- ☞ Splintage
 - Static
 - Dynamic
- ☞ Early competent analgesia
- ☞ Avoid swelling
 - Exercise
 - Elevation
 - Coban



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Flexion Contracture

- ☞ Non-operative management
- ☞ Check rein ligament release
- ☞ Percutaneous accessory collateral release
- ☞ Total collateral excision
- ☞ Total anterior tenoarthrolysis (TATA)
- ☞ Distraction arthroplasty

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Non-operative treatment of flexion contracture



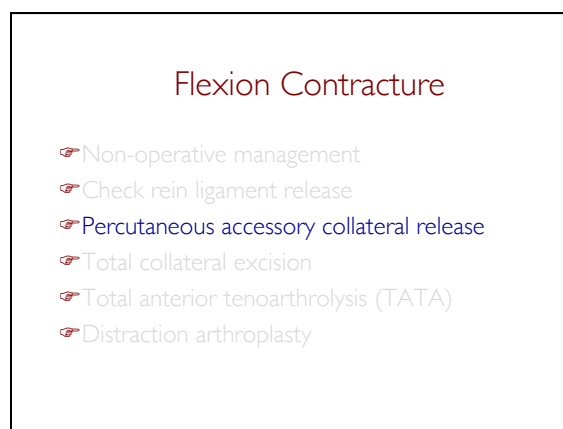
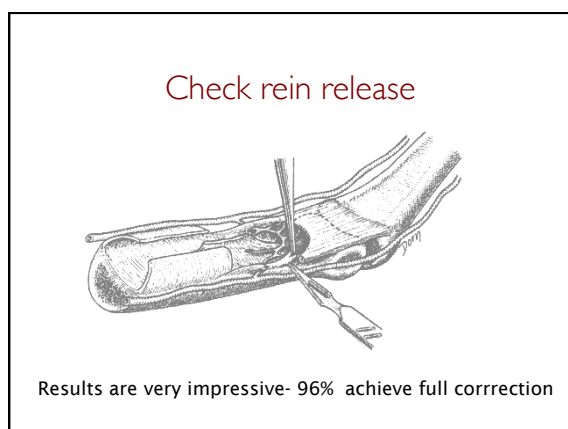
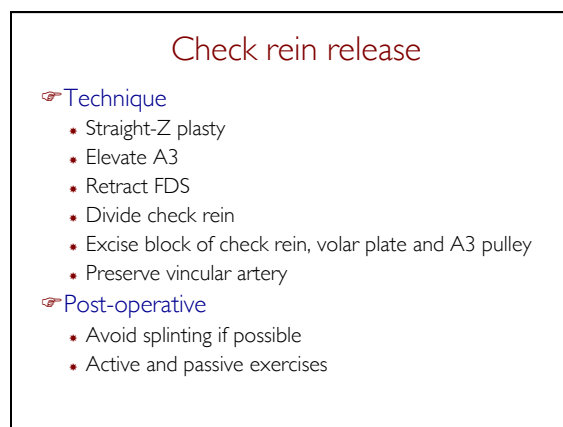
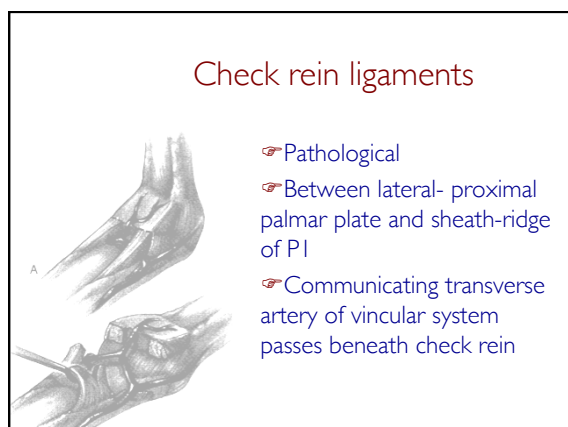
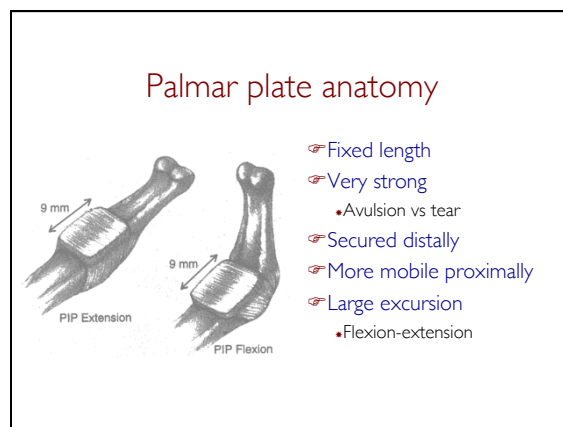
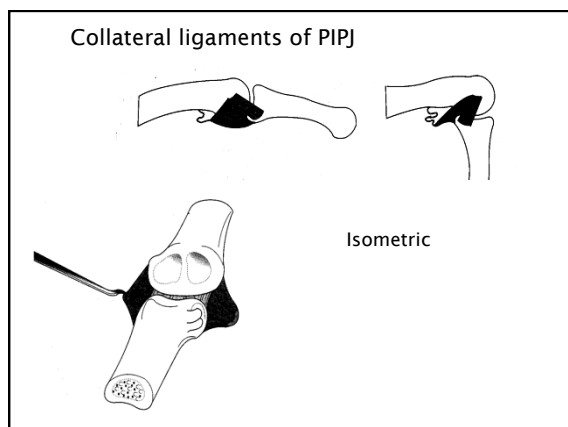
- ☞ Exercise
 - Active
 - Passive
- ☞ Static splints
 - Zimmer
 - Thermoplastic
- ☞ Serial Casting
- ☞ Dynamic splints
 - Capener
 - Joint Jack

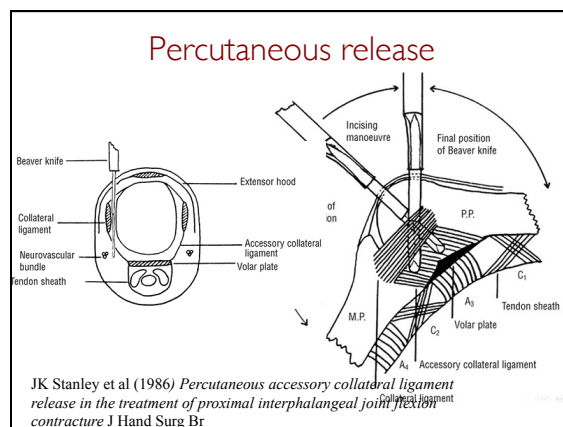
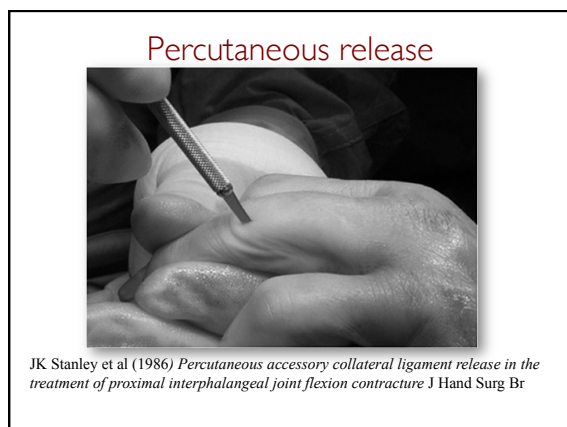
Surgical release Indications

- ☞ Loss of functional extension
 - * good flexion
 - * congruous pain free joint
 - * no extensor tendon pathology
 - adhesion
 - Boutoniere

Flexion Contracture

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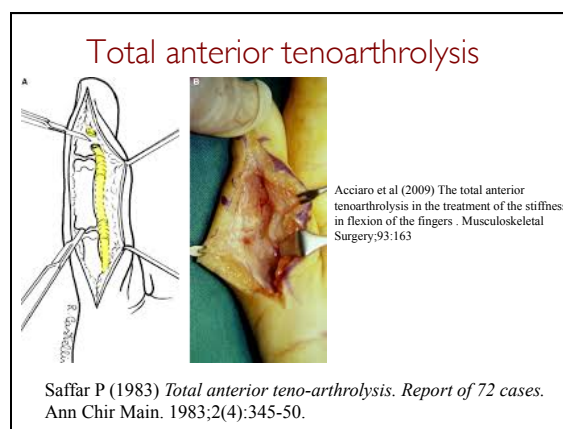




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- ### Total collateral ligament excision
- ☞ Diao and Eaton
 - JHS 1993 18A:395-402
 - ☞ N=16
 - ☞ From 38° to 78°
 - ☞ No instability
 - ☞ Ligaments seem to regenerate (MRI)
-

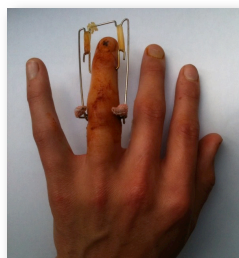
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Distraction Arthroplasty



- ☞ Indications
 - post op arthrolysis

Distraction for Proximal Interphalangeal Joint Contractures: Long-Term Results

Shirzad Houshian, MD, Shan Shan Jing, MB, Gholam Hussein Kazemian, MD, Mohammad Emami-Moghaddam-Tehrani, MD

- ☞ 94 patients
- ☞ average time from injury 48 ms
- ☞ Mean follow up 54 ms
- ☞ Distraction 10 days
- ☞ Improvement
- ☞ 40 degrees extension
- ☞ 25 degrees flexion



J Hand Surg (Am) 2013;38A:1951-56

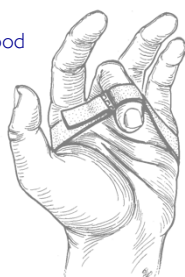
Management

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- ☞ Joint Incongruity or pain
- ☞ Tendon adhesion

Extension contracture

☞ Usually associated with more widespread adhesion of extensor hood

- plate
- kwires
- cut tendon
- ☞ Non-operative
 - Flexion strap
 - Stretching active and passive
- ☞ Surgery
 - Dorsal tenolysis
 - capsulotomy




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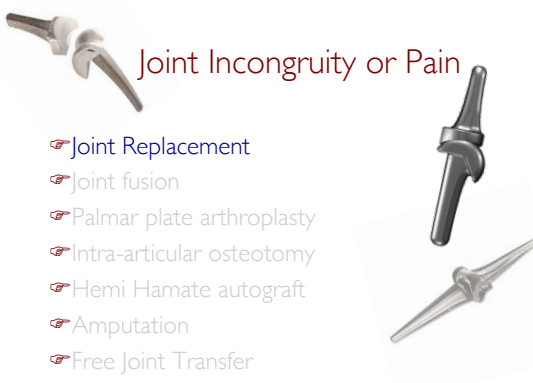
Joint Incongruity or Pain


- ☞ Joint Replacement
- ☞ Palmar plate arthroplasty
- ☞ Intra-articular osteotomy
- ☞ Hemi Hamate autograft
- ☞ Joint fusion
- ☞ Amputation
- ☞ Free Joint Transfer



Joint Incongruity or Pain

- ☞ Joint Replacement
- ☞ Joint fusion
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- ☞ Amputation
- ☞ Free Joint Transfer




INSTRUCTIONAL REVIEW: UPPER LIMB
Proximal interphalangeal joint replacement in patients with arthritis of the hand
 A META-ANALYSIS

J. Adams,
 C. Ryall,
 A. Pandyan,
 S. Metcalf,
 M. Stokes,
 S. Bradley,
 D. J. Warwick

From
 Musculoskeletal
 Biomedical Research
 Unit, University of
 Southampton,
 Southampton, United
 Kingdom

We systematically reviewed all the evidence published in the English language on proximal interphalangeal joint (PIP-J) replacement, to determine its effectiveness on the function of the hand and the associated post-operative complications. Original studies were selected if they reported clinical outcome with a minimum of one year's follow-up. Quality was assessed using the Cowley systematic review criteria modified for fingerjoint replacements. Of 319 articles identified, only five were adequately reported according to our quality criteria; there were no randomised controlled trials. PIP-J replacements had a substantial effect size on hand pain of -23.2 (95% confidence interval (CI) -27.3 to -19.1) and grip strength 1.2 (95% CI -10.7 to 13.1), and a small effect on range of movement 0.2 (95% CI -0.4 to 0.8). A dorsal approach was most successful. Post-operative loosening occurred in 10% (95% CI 3 to 30) of ceramic and 12.5% (95% CI 7 to 21) of pyrocarbon replacements. Post-operative complications occurred in 27.8% (95% CI 20 to 37). We conclude that the effectiveness of PIP-J replacement has not been established. Small observational case studies and short-term follow-up, together with insufficient reporting of patient data, functional outcomes and complications, limit the value of current evidence. We recommend that a defined core set of patients, surgical and outcome data for this intervention be routinely and systematically collected within the framework of a joint registry.

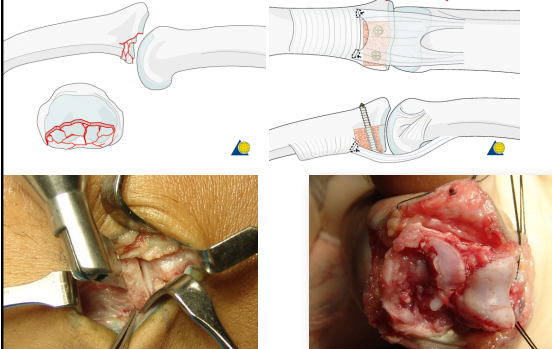
J Bone Joint Surg 2012 94B 1035-40

Silicone Joints

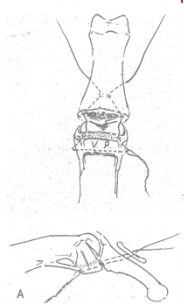
do not have to be perfectly placed
they are
forgiving



Hemi hamate arthroplasty




Palmar plate arthroplasty



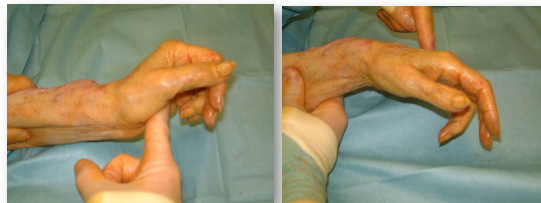
- ☞ Eaton et al
 - JHS 1980;5:260-268
 - N=24
- ☞ Bilos et al
 - JHS 1994;19A:189-95
 - N=11
- ☞ Stable, good ROM

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Passive tenodesis

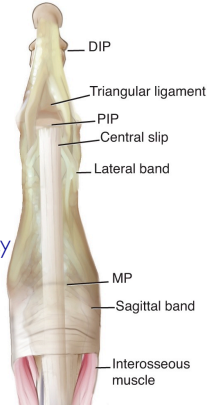


Extensor Tendon Adhesion

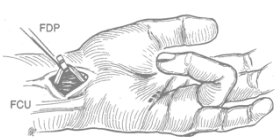
- ☞ Predisposition
 - Crush injury
 - Tendon injury
 - Surgery
 - Plates, wires, poor technique
- ☞ Examination
 - Restricted PIP flexion passively
 - Limited active extension
 - Passive extension satisfactory

Extensor Tenolysis

- ☞ Creighton et al
 - Hand Clin 1994;10:111-116
- ☞ N=56, retrospective
- ☞ May need dorsal capsulotomy
- ☞ Results not influenced by delay



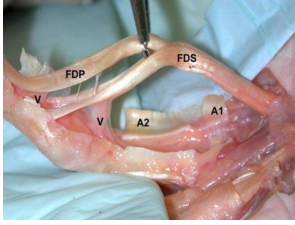
Flexor tendon adhesion



- ☞ Less common than extensor tendon
- ☞ Diagnosis
 - Poor active pull-through in flexion
 - Passive flexion not affected
 - Differential position of MPJ

Flexor tendon adhesion Treatment


- ☞ Flexor tenolysis
 - gentle surgery
 - high magnification
 - preserve pulleys
- ☞ Two stage repair
 - damaged tendon and pulleys



Treatment Tendon adhesion


- ☞ Early mobilisation, stable finger
- ☞ Intensive hand therapy
 - Active
 - Passive
 - Splints?
 - Static
 - Dynamic

Role of gels



Tendon & Peripheral Nerve

- ☞ Evidence
 - Riccio et al (2010) Efficiency of Hyaloglide in the prevention of the recurrence of adhesions after tenolysis of flexor tendons in zone II: a randomized, controlled, multicentre clinical trial Hand Surg Eur 35(2):130-8.
- ☞ RCT n=45
- ☞ Better outcome with gel




Summary

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