Central Slip Rehabilitation
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• 1995 Establishment of the association
• 620 members
• Member of „European Federation of Societies for Hand Therapy“ (EFSHT) and „International Federation of Societies for Hand Therapists“ (IFSHT)
• Cooperation partner of German Society of Hand Surgery (DGH)
Rehabilitation after extensor tendon injuries at the PIP joint

• Problem
  – Immobilization
    • Adhesions
  – Mobilization
    • Insufficiency of Ext. Tendon
    • Risk of rupture

Skylla und Charybdis
Post-treatment methods after extensor tendons injuries

• **Immobilization**

• **Dynamic mobilization**
  – passive stretching
  – active bending
  – „reversed Kleinert-regime“

• **Active Mobilization**
  – SAM (Early active Short Arc Motion) protocol
Extension of the PIP- joint

Extrinsic muscles ↔ Intrinsic muscles
Dorsal aponeurosis

Extrinsic Extensors
Intrinsic Extensors
Dorsal aponeurosis

Pars lateralis des Tr. intermedius
Pars medialis des Tr. lateralis
Lamina triangularis
Lamina intertendinea
Ligg. retinaculare obliquum and transversum (Landsmeer)

*aus Schmidt, Lanz*
Anatomy

- Blood flow:
  - worse: 8-10 weeks, small, 3mm, static
  - better: 4-6 weeks, big, 40mm, dynamic

- Immobilization period:
  - worse

- Tendon sliding amplitude:
  - better

- Post-treatment principle:
  - worse
Extrinsic Extensors

The higher the glide amplitude, the greater the restriction of movement because of adhesions.
Zones

zone 1+2

zone 3+4

zone 5-8
Wide contact zone between bone and tendon

Indications

- Fresh isolated injuries of the zones 3 and 4
- Fresh combined injuries of the zones 3 and 4, mobilization according to the SAM-protocol, associated injuries permitting
- Reconstructions of the extensor tendons of the zones 3 and 4
- Surgically treated bony avulsions of the Tractus intermedius
Zone 3
Closed injuries
-> difficult to diagnose
Clinical evidence test:
Incomplete PIP joint extension
„Table edge test“
MRI?
Zone 3

Mechanism of injury:
- Closed injuries
- Open violation
- Defect injury

Clinical evidence:
Lack of PIP joint extension

In older injuries the development of a boutonniere deformity is possible
Zone 3

Therapy:
- with fresh closed injuries
- with boutonniere deformity without contracture

8 weeks PIP joint in extension with free DIP joint
Zone 4

- Usually incomplete transection after laceration injuries
- Often only slight extension deficit
Follow-up treatment zone 3 and 4

SAM – Protocol
Short Arc Motion

= standardized treatment concept

Evans R.B.-1995
Quelle: www.indianriverhandrehab.com

Lateral bands
Central slip
Aims

- Protection of the tendon suture
- Avoiding of tendon adhesions by allowing of the early active mobilization in a small, slowly increasing range of motion
- Prevention of PIP-contractures
Requirements

- Good patient compliance
- Willingness to attend regular follow-up appointments
- No associated injuries early post-operative treatment contraindicated
- Pre-operative: passive extension of PIP joint
Splint treatment

- Starts from the 2nd post-operative day
- Over a period of 6 weeks
- Using 3 different splints

1 resting splint

2 exercise splints
Resting splint

**Purpose:** maintain the PIP- and DIP joint in 0° extension to protect the suture

**Wearing time:** full-time, remove for exercise only 6 weeks day and night
Exercise splint 1

- Blocking
  - PIP- joint at 30° Flex
    - (weekly increase 10°!)
  - DIP-joint at 20-25° Flex

- Exercise frequency
  - 20x / waking hour

- Position to train
  - wrist in 30° flexion
  - MP-joint at 0°

Exercise splint 2

- Immobilization
  - PIP at 0°

- Blocking
  - DIP at 30° – 35° Flex,
    But only when lateral bands were repaired
  - Otherwise DIP – joint free

- Exercise frequency
  - 20x / waking hour

- Position to train
  - Wrist at 30° Flexion
  - MP-joint at 0°

SAM – increase movement

- Reducing the blocking for the flexion of the PIP-joint
  - Up to 40° after 2 weeks
  - Up to 50° after 3 weeks

Requirement:
Full active extension of the PIP-joint

- Exercise splints worn for 4 weeks
- Exercises without resistance,
  starting position: **wrist 30° flexion, MP joint in extension**
- Resting splint worn in full-time in exercise-free time for 6 weeks

Evans RB, Thompson DE (1993)
SAM-Protocol

!! Often no further treatment necessary !!

After 6 weeks:

• Mobilization multi-joint
• Enhance tendon gliding
• Work for full fist-circuit
• Conserving the extension
• Stress only after 12 weeks
Result after 6 weeks
After 2 weeks... if needed

Dynamic splint when not reaching a full active extension at the PIP- joint
Conclusion

SAM – Protocol is a convincing concept

• Consideration:
  – High compliance of the patient and
  – Special expertise of the therapy team and
  – Monitoring with regular and frequent follow-up appointments are absolutely necessary!
World congress 2019 in Berlin
Thank you