

REVIVING HANDS CONGRESS
18 NOVEMBER 2023
CROWNE PLAZA AIRPORT

BHT
handgroup

Postop Rehabilitation CMC1

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Before surgery **After surgery**

Neuroplastic changes (Elbert et al. 1997) New pathways !!

Misuse thumb Restore JPS

Incorrect muscle memory
Hypertone AdP
No pronation
Hyperextension MP

MUSCLE MEMORY

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5 reasons: **handtherapy** indispensable postop

1. Improve JPS & Strength
2. Hypertonia AdP
3. Wrist stability
4. Improve functionality
5. Literature

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1. Improve JPS & Strength

Stabilizer MP
Flexion-MP
Res. **Powerfull stabilizer**

Proprioception muscle

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1. Improve JPS & Strength

1^{ste} DI
Power muscle

Proprioception returned
↓
Isometric ex. - /dyn/ joint stability

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2. Hypertonia AdP (Holzbauer 2022)

- Sustained dorsolateral shear stress
- Decreased rotation – radial abduction
- Contracture of whole first web
- Impaired pinch & grip strength

Adductor pollicis


Stretch AdP

DN


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3. Wrist stability



- Trapeziectomy: **midcarpal collaps** (Tay ea. 2007, Brouwers ea. 2020)
 - Train midcarpal stability: ECU-FCR /Isom/
- To prevent **de Quervain tendinopathy** (Goubeau et al. 2015)
 - EPB and APL: thumb and wrist

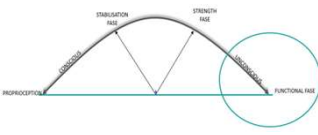


Not only thenar muscles?
Further research

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4. Improve Functionality



Adjust maladaptive patterns
Young patients – maximize lifespan

Entire body
Reintegrate **new NM pattern**

A LOT OF REPS



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5. Literature

| Year | Author | Category | Immobilization | | | | ROM | | | | Strengthening | | | | |
|------|------------------------|------------|----------------|---|---|---|-----|---|---|---|---------------|----|----|----|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 2002 | Forriack et al. - Linn | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2002 | Forriack et al. - Kang | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2004 | Mo and Goldstein | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2004 | Wang-Au et al | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2006 | Swidma et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2007 | Swidma et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2009 | Raywood et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2009 | Griffin et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2011 | Souch et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2011 | Park et al. - Homa | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2011 | Paik et al. - Cho | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2012 | Robar et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2012 | Probst and Hahry | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2013 | Souch | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2014 | Prosser et al. - Rigg | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2014 | Prosser et al. - Rigg | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2014 | Prosser et al. - Rigg | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2014 | Vermeulen et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2014 | Vermeulen et al | EPB | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2017 | Borges A. Vazirani A. | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2006 | Shaw et al | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2009 | Shaw et al | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2013 | Souch | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2017 | Borges, Medina | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2011 | Borges A. Vazirani A. | Prosthesis | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

• LRTV/Trapez + weeks immob

• Prosthesis 2 weeks immob

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5. Literature

Early /a/ ROM?
Early strengthening ex?

**More convenient
No worse outcomes**

Prolonged splintage?

Neither necessary nor desirable

Grip and pinch strength?

Superior with prosthesis

Limitations in ADL?


Faster recovery early protocol

- Comparative studies are lacking
- 2 studies compared diff rehab after same surgery (Horlock 2002, Prosser 2017)
- Lot of studies small sample size




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Take home message



- Poor proprioception & weak neuromuscular control: TRAIN!
- Handtherapy: look beyond the thumb
- High quality studies needed – refine treatment protocols
- Good outcome






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Q&A

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