# Hand Replantation and Rehabilitation

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# Introduction

The following presentation will discuss:

- The **rehabilitation** and **excellent functional outcome** of a complete distal forearm avulsion amputation
- How and why our protocol differed from current practice
- A brief outline of our protocol
- Discussion of the main aspects we view as critical to the excellent outcome
- Conclude with potential for further research

# Case Study

- Replanted with 2cm bone shortening
- Referred to OT for early ***controlled active motion*** on day 6
- Extensive OT in 1st year: this included
    - early controlled active motion (ECAM),
    - many custom moulded orthoses,
    - functional retraining
    - sensory re-education
- No additional reconstructive procedures were performed
- He completed two years of rehab last year

# Case Study: 1 year post Surgery

- Excellent range of motion:
  - almost full flexion and extension of the digits
  - able to oppose thumb to all fingers
  - good intrinsic return
- 32% power grip strength
- Protective sensation
- Mildly impaired co-ordination (30 seconds on 9 Hole Peg Test).
- Subjectively, the patient was highly satisfied and was managing well at work.

# Replantation after complete avulsion/ limited crush amputation (zone 5)

# What did we do differently?

- Majority of protocols *postpone* active motion for up to *4 weeks* post surgery. Few authors recommend ECAM.
- Most use orthoses in rehab, however some only in the acute stage. There is a paucity of literature detailing the rehab and the exact orthoses used.
- The integration of occupation based intervention is seldom mentioned.

# Why did we differ?

- The surgeon hypothesized that chances of tendon ruptures were very minimal due to bone shortening
- A 2 strand technique of tendon repair with 3/0 prolene was used
- He placed more concern on preventing tendon adhesions as all were repaired at the same level
- It is well documented that early active mobilisation is known to reduce adhesions

# Our Rehabilitation Protocol: Day 6

- Post surgical backslab:
  - Wrist 0-15° extension, MCP's in 50-60° flexion & IP's in extension.
- ROM:
  - Full protected PROM of digits, within limits of post surgical backslab
  - Followed by ECAM, including differential tendon gliding.
- Seen 1-2 x day in ICU/ general ward.


ADULT

# Our Rehabilitation Protocol

- Week 2:
  - Taught patient to do his own digit P/AROM 3 x day.
  - Very gentle blocking exercises  FDS, FDP, EDC, FPL.

- Week 3:
  - Fit with dorsal orthosis
  - Edema management
  - Full forearm rotation (if doctor allows).
  - Begin wrist ROM (active-assisted)

- Week 4:
  - Light activities for digits in therapy.

# Our Rehabilitation Protocol

- Week 5:
    - Gentle flexor tendon stretching if needed.
    - Remove dorsal orthosis for light self-care e.g.: feed self with thick grip on spoon
- Week 6:
    - D/C dorsal protective orthosis,

    except for protection when in public.
    - Orthoses to enhance function
    - Functional Retraining


Aqueous
Cream


Aqueous
Cream

# Our Rehabilitation Protocol

Week 8:

- Strengthening
- Extensor tendon stretching & orthosis if needed.
- Initiate sensory evaluation & reeducation

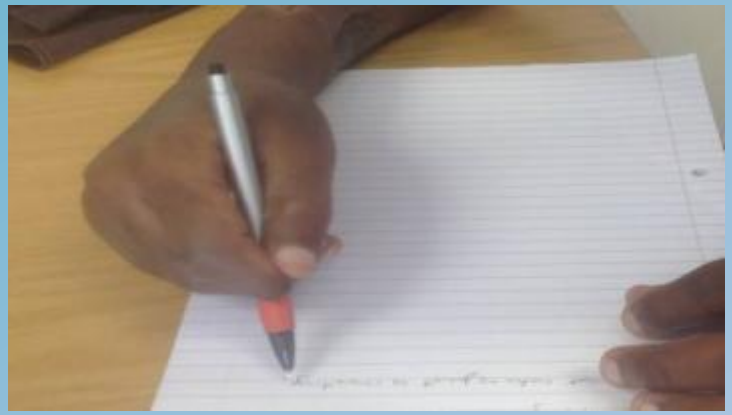
- Week 12:
  - D/C dorsal protective orthosis in public.
  - Goal: Return to light work

# Discussion

We believe there are 3 components that have been essential in the rehabilitation of our Cases

- Recently published protocols advocate AROM at 3 or 4 weeks post upper limb replantation. We initiated ECAM on day 6.
- Several orthoses were custom fabricated according to each patients needs.
- The integration of occupation based intervention as a treatment medium, in combination with therapeutic exercises

# Conclusion



- ECAM at 5-7 days post,
  has been previously described by
  Papanastasiou in 2002.
- Our surgeon hypothesized that chances of tendon ruptures were very minimal due to bone shortening
- No data was found on the influence of bone shortening and tension on tendon repairs.
- The author recommends a prospective trial.
- Our protocol is detailed in the article with the intention of allowing other therapists to replicate our rehab

# References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