Fingerprints

June 2023

HAND THERAPY NEW ZEALAND
Ringaromi Aotearoa

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Editors' Note

Kia ora colleagues,

This is the second edition for 2023. Thanks to Mark Lanigan from Hands On who has kindly agreed to share his great in-service presentation on distal triceps repair. We don't see many patients with this presentation and I found Mark's case study interesting and educational. If you have any material that you would like to share on Fingerprints, please send us an email at fingerprints@handtherapy.org.nz

Nico

Distal triceps rupture and surgical repair

By Mark Lanigan

Distal Triceps ruptures are rare musculotendinous injuries and typically present in clinical practice as lacerations or traumatic sudden resistance against elbow extension mechanisms. The current case study describes the initial clinical presentation to hand therapy, acute diagnosis, onward referral, pre and post-surgical rehabilitation of a traumatic distal triceps rupture. The background reading demonstrates limited research beyond retrospective orthopaedic case reviews. However, basic post operative guidelines have been described in research and the recommendation is to have close consultation with the surgeon in order to provide intra operative particulars, specific rehabilitation instructions, expectations and timeframes.

You can find Mark’s slides on the next page. Thanks Mark for sharing!

CASE STUDY:

DISTAL TRICEPS RUPTURE AND SURGICAL REPAIR

BY MARK LANIGAN

MHSC (MUSCULOSKELETAL PHYSIOTHERAPY) REGISTERED HAND THERAPIST

DISTAL TRICEPS RUPTURES

- Extremely rare less than 1 % of upper limb injures
  - As reported by Anzel et al. from their 1959 case review of 1014 upper limb tendon patients at the Mayo Clinic.
    - M:F 2:1
    - Wide age range most frequently between 30 and 50 years
  - In an NFL case review only 21 distal triceps ruptures reported over 6 years

  (Mair, Isbell, Gill, Schlegel & Hawkins, 2004)
- True incidence difficult to calculate- research limited to case studies and retrospective reviews

(Tom, Kumar, Cerynik, Mashu & Parrella, 2014)

CASE STUDY:

- 65 yr old Male
- Active, heavily set, manual worker
- Mechanism
    - riding a mountain bike – hit a tree root
    - sudden elbow extension load to decelerate forced elbow flexion.

INITIAL PRESENTATION

- Presented 3/7 post injury
- Moderate to severe posterior elbow swelling and bruising
- Mildly tender olecranon, appeared more prominent (most likely the ruptured tendon void).
- 4 out of 5 power elbow extension.
  - Full elbow extension above head against gravity.

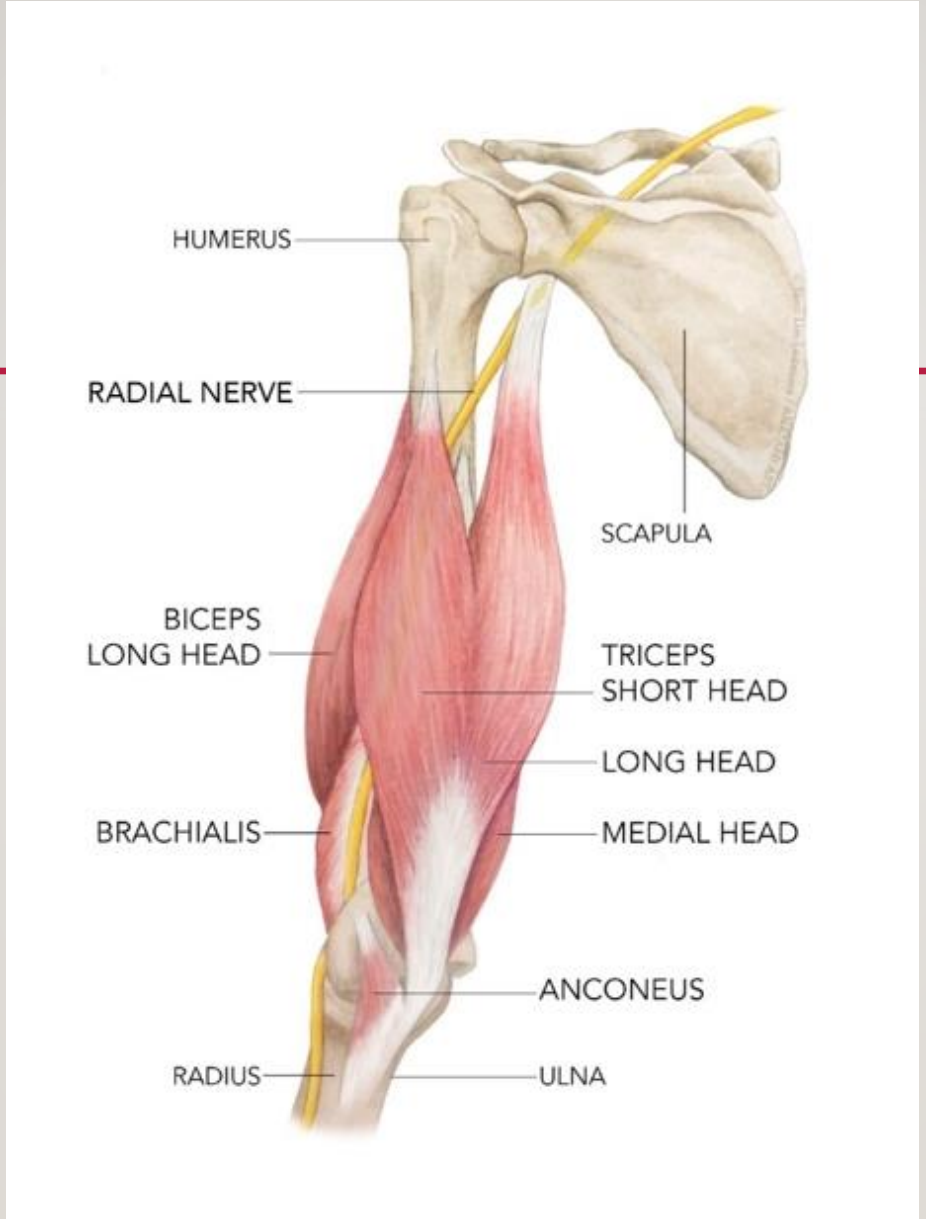
IMAGING

- Ultrasound findings → ruptured fibres of the triceps tendon from the combined lateral and long heads with 4 cm retraction
- MRI →The lateral triceps ruptured

CLINICAL VALUE OF IMAGING

- Avulsion fracture at olecranon process seen in 61 % of cases from systematic review of distal triceps rupture surgical intervention studies.
- Interesting medical comorbities included; 10% renal disease and 6% anabolic steroid use.

(Dunn, Kusnezov, Fares, et al, 2017)


HUMERUS
RADIAL NERVE
SCAPULA
BICEPS
LONG HEAD
TRICEPS
SHORT HEAD
LONG HEAD
BRACHIALIS
MEDIAL HEAD
ANCONEUS
RADIUS
ULNA

TRICEPS BRACHII

- Action: primary elbow extensor

  Long head assists with the extension/adduction at the shoulder joint

- Innervation : radial nerve C6 C7 C8
- Origin :
  - Lateral head: humerus posteriorly, superior to the radial groove
  - Long head infra glenoid tubercle
  - Medial head humerus posteriorly, inferior to the radial groove
- Insertion: olecranon

(Tiwana et al, 2022)

PRE OPERATIVE REHABILITATION

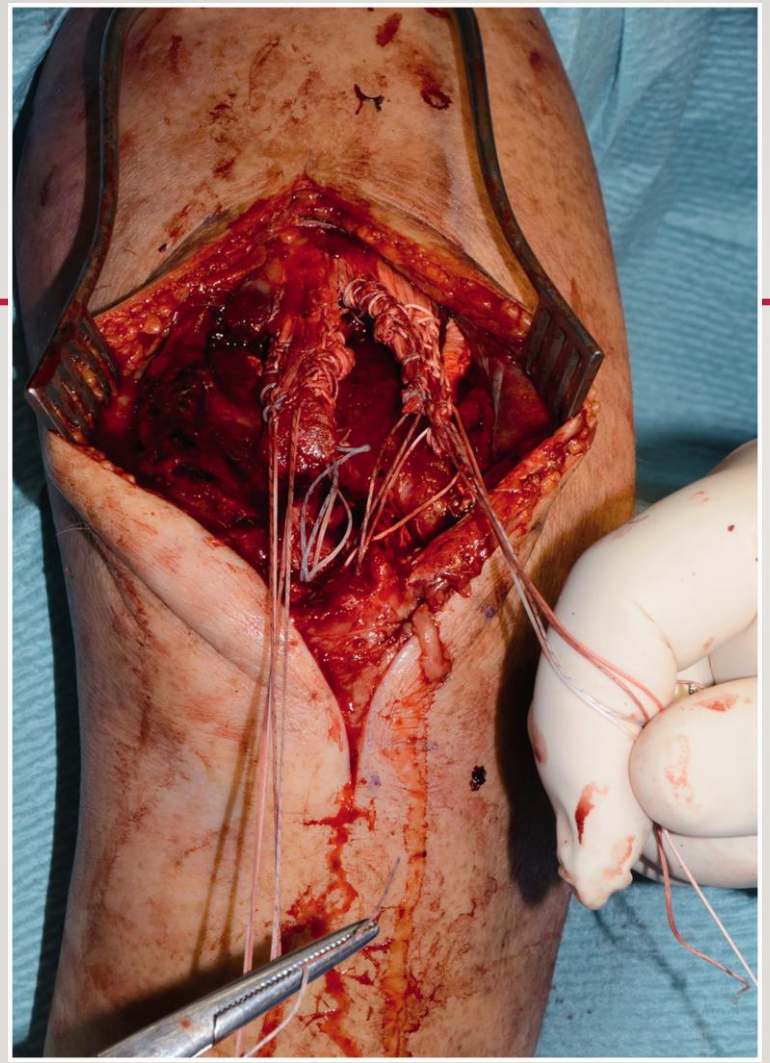
- Initial swelling control and rest in thermoplastic dorsal elbow splint at 30-45degs for 2 weeks.
- Orthopaedic review and plan to commence prehab
- Isometric strengthening at 30 deg, 60 deg and 90 deg open and closed chain
- Band work: push and pull theraband in straight and bent arm variations
- Light dumbbell – flys, curls and bent over rows

REPAIR AND TIMEFRAMES

- Surgery 8 weeks post injury
- Bain and Durrant (2010) state that beyond 6 weeks direct triceps repair troublesome
  - Attrition of the ruptured stump and reduced viable tendon for repair
- Chronic tears typically reconstructed with hamstring graft techniques
- Peter Poon performed a direct repair
- Dual suture with tunnels drilled into the olecranon, secured with an endobutton

SURGICAL OBSERVATION

- The lateral triceps that was reported on MRI scan to be ruptured was found to be intact.
- In fact, the ruptured triceps was the medial head and retracted 6 cm along with the adjoining long head of triceps.



Kocialkowski, Carter and Peach (2018)

PETER POON POST OPERATIVE PROTOCOL

Tightly controlled by Peter Poon post operatively

- Patient fitted with dual hinged ROM brace for initial 2 weeks at 15deg to protect the tendon fixation.
- At 2 week post op review Peter completes wound care and ROS himself.
- For week 2-6 add 40 degrees per fortnight
- 6 week post op review and clearance to commence formal rehabilitation

POST OPERATIVE REHABILITATION

- Kocialkowski, Carter and Peach (2018) Post operative protocol based on retrospective case series.
  - Identical to Peter Poon's initial first 6 weeks, except weekly rather than fortnightly incremental increases in elbow flexion within hinged ROM brace.
  - We re-employed the pre operative rehabilitation at weeks 6-12 post operatively .
- Isometric strengthening at 30 deg, 60 deg and 90 deg open and closed chain
- Band work: push and pull theraband in straight and bent arm variations
- Light dumbbell – triceps extension, flys, curls and bent over rows
- Progressing to wall press-ups, 4 pt kneeling, superman's and triceps dips after 12 weeks post op.

RETURN TO WORK

- Agarwalla et al. (2000) showed in their retrospective study of 81 DTR patients RTW
- 93% RTW by 2.2 months +/- 3.2
- Of the 26 participants registered with heavy intensity work 77% (20) return to pre injury work intensity at 4.8 months +/- 3.9
- Retrospective review of DTR in military population , showed a 13% traumatic re rupture rate in 94 participants (Balazs et al., 2016)

REFERENCES

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Educational opportunities

Below are a series of resources for educational purposes that the HTNZ Education committee and us have identified in the last period:

Online Journals

Hand Therapy New Zealand offers access to several fantastic journals. If you haven't already done so, head over the Journal page and try accessing any of the resources available (e.g. Journal of Hand Therapy). If you do not have a log in, contact admin@handtherapy.org.nz to receive a unique login code. The benefit of having access to these journals is that if you find an article on HandyEvidence that you like or you just want to search for information in the journals, you can often access the full text.

Anatomy Standard

This resource contains anatomy images, which are free to reproduce for non-commercial use. You can access Anatomy Standard online and cruise through several upper limb anatomical layers. Thanks to Tom Adams from AUT who pointed this resource out.

HandyEvidence

Nico's website reviews and assesses three clinically relevant scientific articles on Hand Therapy every week. In addition, it contains a database of over 300 previous synopses searchable by topic and level of evidence. It has been sponsored by HTNZ for 2022 for all New Zealand Hand Therapists. Get the HTNZ Special and you will have full access.

Consent for clients' information and images

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Consent form – use of clinical case information and images

I, (*patient's name:* _____) consent to the use of information and images including photographs or videos from my hand therapy assessment and treatment to be used for (*mark agreement by clicking on box or print and tick*)

- ☐ Educating clinicians relevant to hand therapy
- ☐ Educating clinical students
- ☐ Service audit
- ☐ Publication in professional or scientific journal

I understand that the information and images will not have my name attached to them and will not obviously identify me in any way.

Patient Details:

Name: _____ Tel: _____

Email: _____

Signed: _____ Date: Click or tap to enter a date.

Clinician Details:

Name: _____ Tel: _____

Email: _____

Organisation: _____

Hand Therapy New Zealand membership ☐Full ☐Associate Membership No. _____

Signed: _____ Date: Click or tap to enter a date.

Consent form case study final 15/02/2021

You can download the original document on HTNZ webpage.