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Outcomes and intraoperative findings of revision surgery for failed subcutaneous transposition of the ulnar nerve

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Background

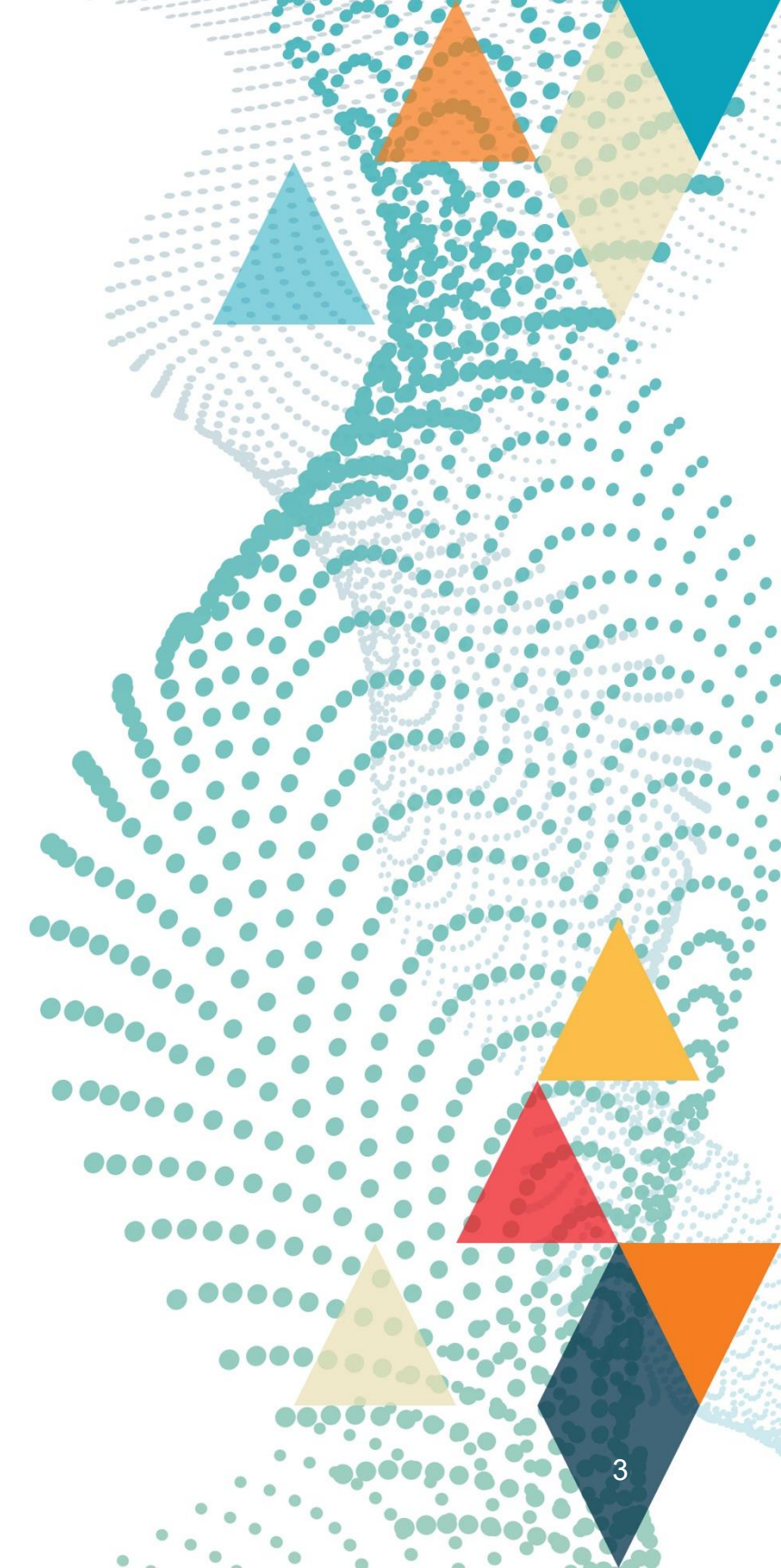
- **Primary Cubital Tunnel Syndrome (CTS) 2° most common nerve disorder of the upper limb**
- **Failure of surgical management is often due to inadequate decompression at key anatomical sites**
- **Aim: to investigate the anatomical factors contributing symptoms persistence/recurrence in failed subcutaneous ulnar nerve transposition**



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Methods

- Retrospective observational study
- 21 pts (11 M; 10 F)
- Mean age: 53 (32 to 72)
- Revision surgery for failed SCT between 2001-2019
- **Exclusion:**
 - 1) post-traumatic CTS
 - 2) symptoms distal or proximal to the elbow
 - 3) in-situ decompression/submuscular transposition as primary surgery

CASE #	GENDER	AGE	DOMINANT SIDE	SIDE INVOLVED	YEAR OF PRIMARY SURGERY	PRIOR DIAGNOSIS	SCT AT PRIMARY SURGERY
1	M	45 years	R	R	2001	Cubital tunnel compression	YES
2	F	32 years	R	R	2002	Ulnar nerve subluxation	YES
3	M	47 years	L	R	2004	Cubital tunnel compression	YES
4	M	52 years	R	L	2004	Cubital tunnel compression	YES
5	F	55 years	R	R	2005	Ulnar nerve subluxation	YES
6	M	60 years	R	R	2007	Ulnar nerve subluxation	YES
7	F	71 years	R	R	2008	Cubital tunnel compression	YES
8	F	56 years	L	L	2008	Cubital tunnel compression	YES
9	M	38 years	R	L	2010	Ulnar nerve subluxation	YES
10	F	65 years	L	R	2010	Ulnar nerve subluxation	YES
11	M	51 years	R	L	2011	Cubital tunnel compression	YES
12	M	49 years	R	R	2012	Cubital tunnel compression	YES
13	M	69 years	R	R	2014	Cubital tunnel compression	YES
14	F	72 years	R	R	2015	Ulnar nerve subluxation	YES
15	F	54 years	L	L	2015	Cubital tunnel compression	YES
16	F	43 years	R	R	2016	Ulnar nerve subluxation	YES
17	M	39 years	R	R	2016	Ulnar nerve subluxation	YES
18	F	59 years	R	L	2017	Cubital tunnel compression	YES
19	M	42 years	R	R	2018	Ulnar nerve subluxation	YES
20	M	69 years	L	R	2019	Cubital tunnel compression	YES
21	F	55 years	R	R	2019	Ulnar nerve subluxation	YES



Clinical assessment

- Muscle atrophy/pinch strenght loss in 7 pts
- Proximal Tinel in 15pts
- Distal Tinel in 6 pts
- Clinical tricep snap in 4 pts
- Mean interval from prior surgery to revision: 12.3 months (5-24)

Pre op McGowan:

Grade I: 7

Grade II: 10

Grade III: 4



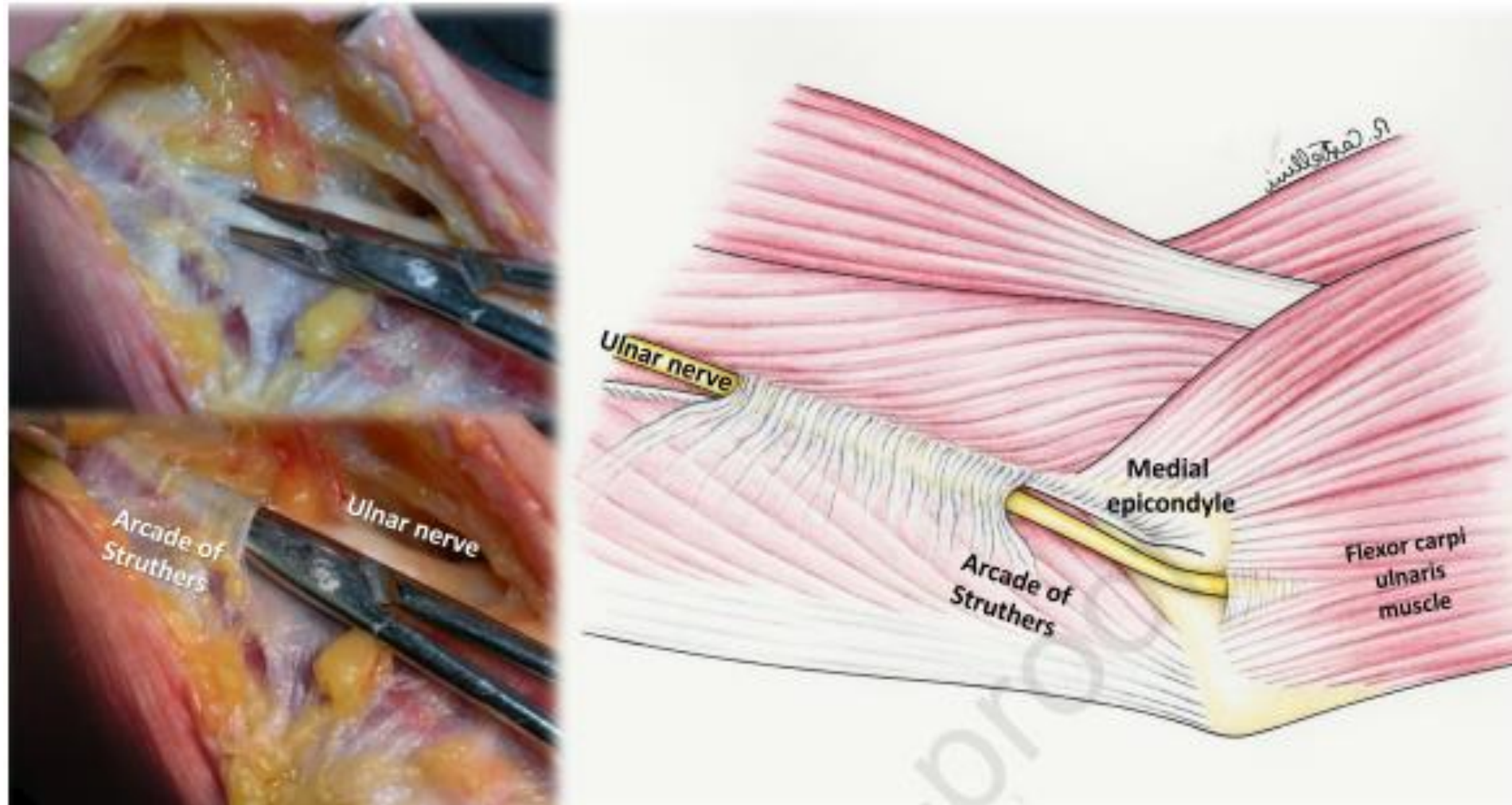
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CASE #	SYMPTOMS AFTER PRIMARY SURGERY	McGOWAN'S SCORE	TIME UNTIL REVISION SURGERY	CLINICAL ASSESSMENT
1	Tinel's sign, paresthesias, motor deficit	II	12 months	p. Tinel, paresthesia, motor deficit
2	Tinel's sign, paresthesias	II	24 months	p. Tinel, paresthesia, TS
3	Tinel's sign, paresthesias, motor deficit	III	8 months	d. Tinel, paresthesia, motor deficit
4	Tinel's sign, paresthesias	II	14 months	p. Tinel, paresthesia
5	Tinel's sign, paresthesias	II	10 months	d. Tinel, paresthesia
6	Tinel's sign, paresthesias	II	5 months	p. Tinel, paresthesia
7	Tinel's sign, paresthesias, motor deficit	III	16 months	p. Tinel, paresthesia, motor deficit
8	Tinel's sign, paresthesias	I	10 months	p. Tinel, paresthesia, TS
9	Tinel's sign, paresthesias	I	6 months	d. Tinel, paresthesia
10	Tinel's sign, paresthesias	I	13 months	p. Tinel, paresthesia, TS.
11	Tinel's sign, paresthesias, motor deficit	II	20 months	p. Tinel, paresthesia, motor deficit
12	Tinel's sign, paresthesias	I	13 months	d. Tinel, paresthesia
13	Tinel's sign, paresthesias	II	15 months	p. Tinel, paresthesia TS
14	Tinel's sign, paresthesias	I	22 months	d. Tinel, paresthesia
15	Tinel's sign, paresthesias, motor deficit	III	12 months	p. Tinel, paresthesia, motor deficit
16	Tinel's sign, paresthesias	II	10 months	d. Tinel, paresthesia
17	Tinel's sign, paresthesias, motor deficit	II	19 months	p. Tinel, paresthesia, motor deficit
18	Tinel's sign, paresthesias	I	6 months	p. Tinel, paresthesia
19	Tinel's sign, paresthesias	I	10 months	p. Tinel, paresthesia
20	Tinel's sign, paresthesias, motor deficit	II	8 months	p. Tinel, paresthesia, motor deficit
21	Tinel's sign, paresthesias	I	5 months	p. Tinel, paresthesia

Intraoperative findings



- 15 (71.4%) proximal compression at the Arcade of Struthers.



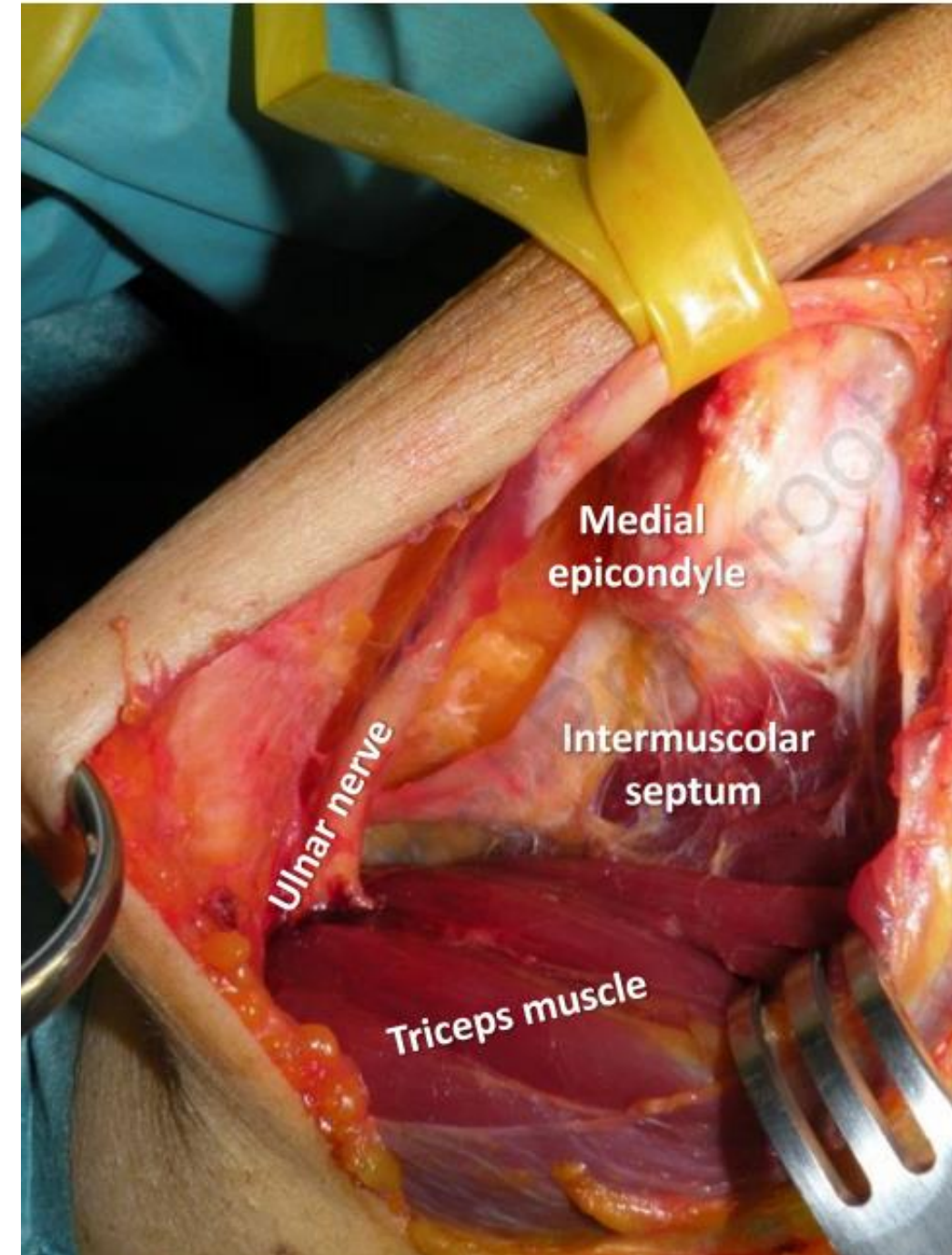
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Intraoperative findings

- 16 (76.2%) intact intermuscular septum
- Most common finding
- Prevention by resection of 3.5cm of the distal portion



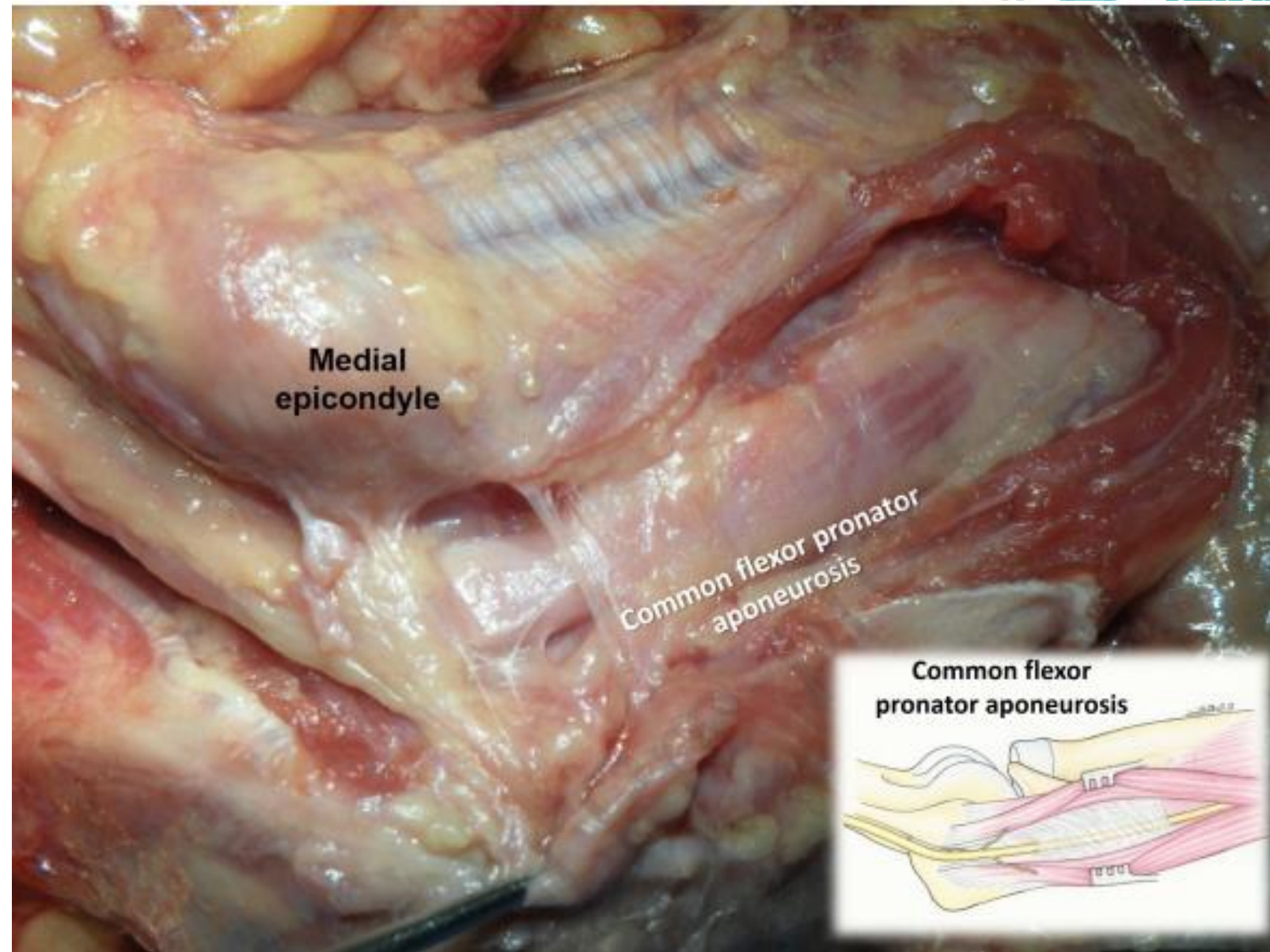
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Intraoperative findings

- 8 (38%) distal compression at the deep flexor-pronator aponeurosis
- More common in transposition sequelae



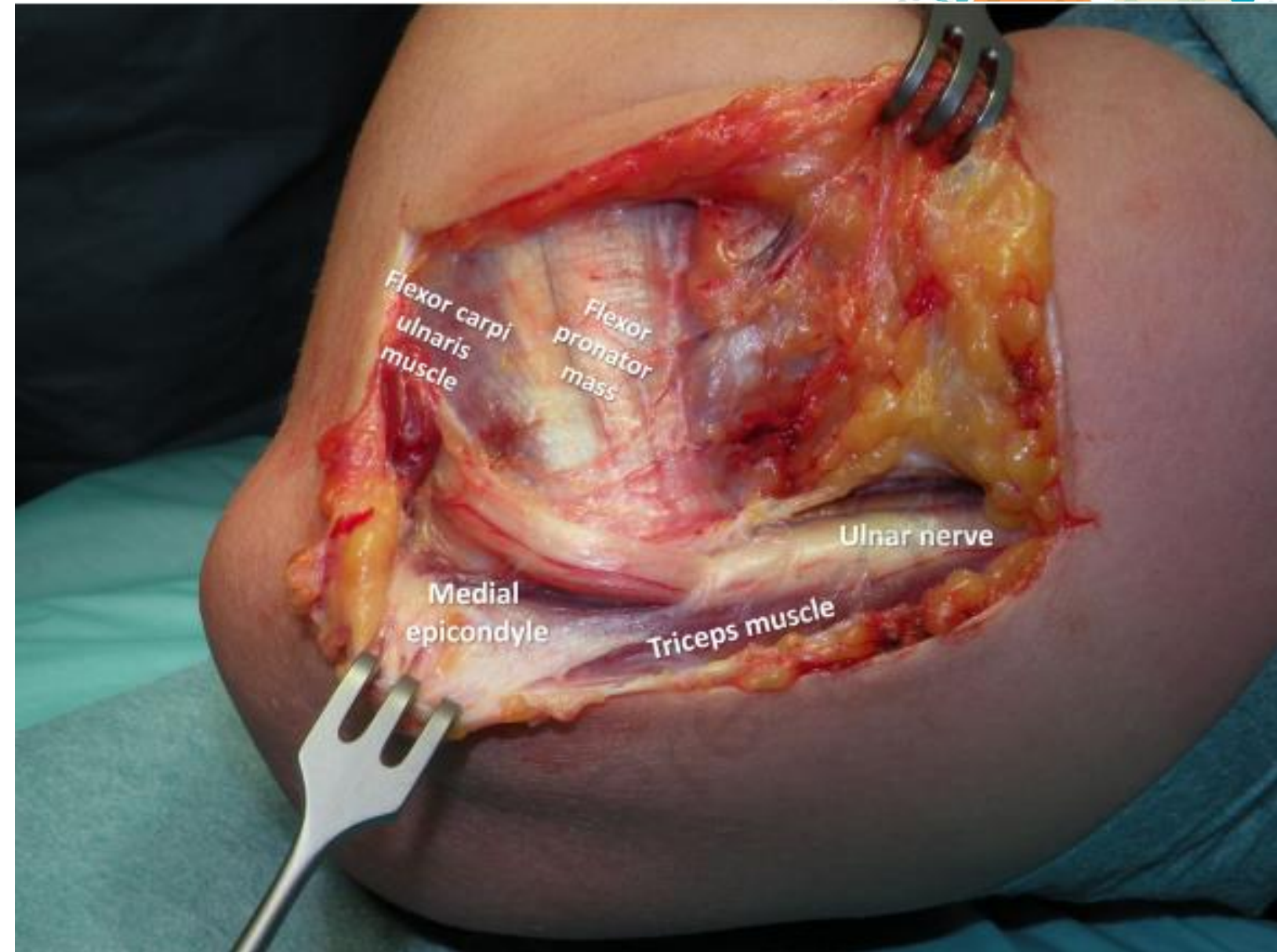
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Intraoperative findings

- 4 (19%) snapping tricep with associated proximal compression and at the intermuscular septum
- Imbrication of the medial portion of the tricep and release of other compression sites achieved symptom resolution
- 4 (19%) epinurotomy



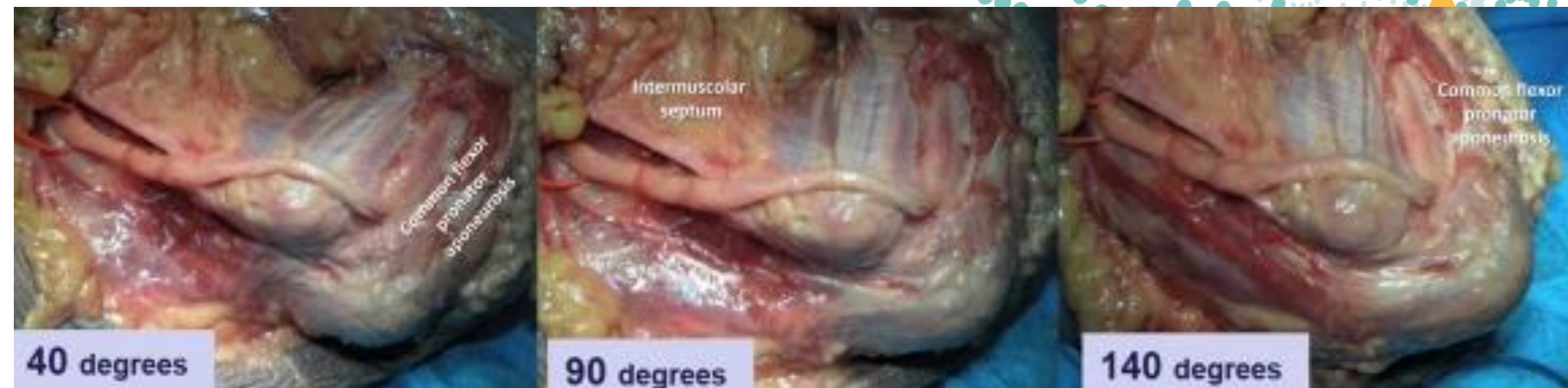
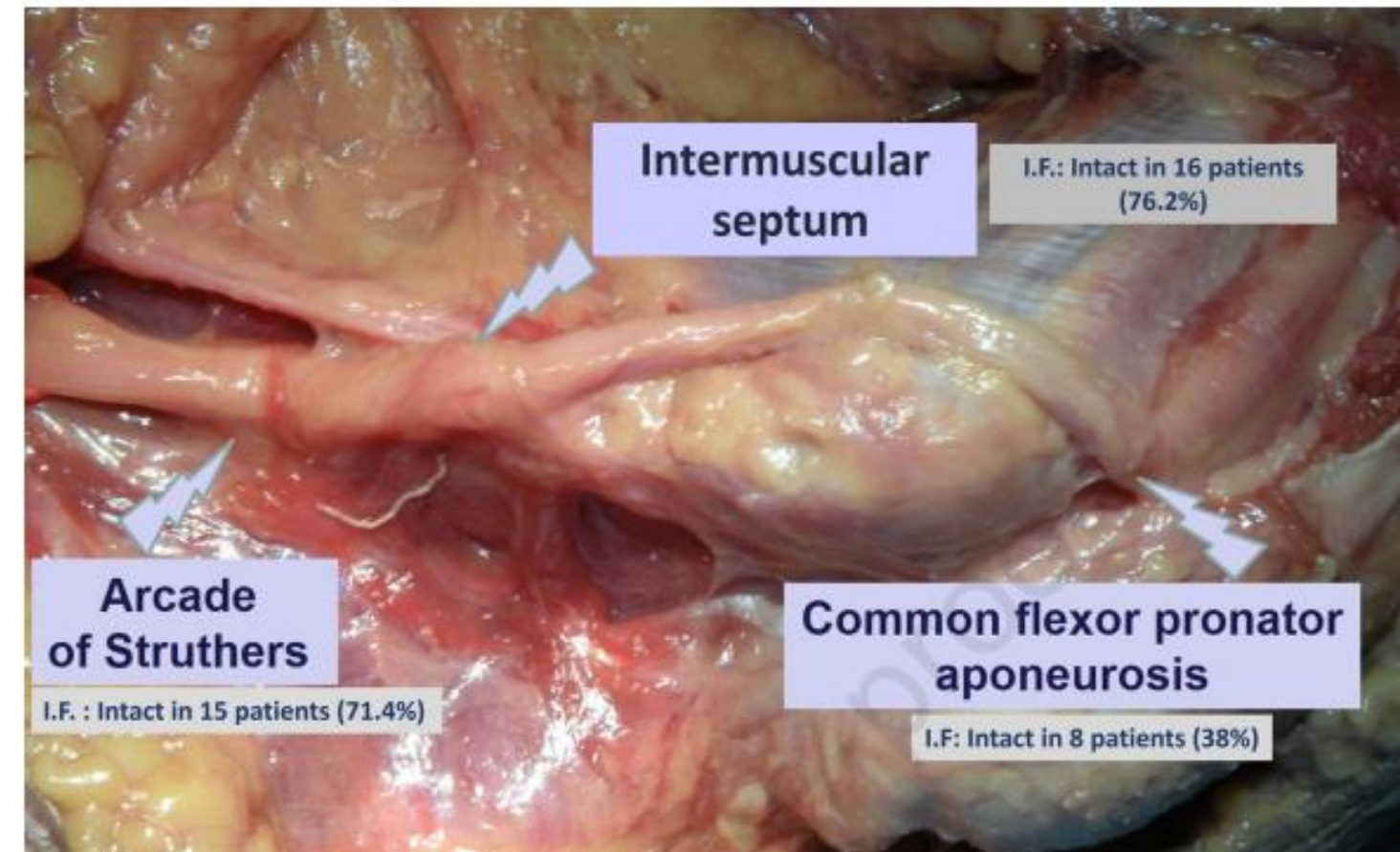
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Intraoperative findings

- Incomplete release of all compression sites contributes to SCT failure
- As the elbow flexes, the nerve kinks at compression sites



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Results

- Mean FU 53.5 months (32-73)
- Revision submuscular transposition in all patients, exception were tricep snapping
- 9.5% minor post op complications
- 90.5% satisfaction

Conclusion:

- surgical decompression of all nerve compression sites is critical to prevent complications.
- Revision submuscular transposition have good results in failed STC

CASE #	POSTOPERATIVE COMPLICATIONS	FOLLOW-UP	MESSINA'S CRITERIA	BMRC SCORE	McGOWAN'S SCORE	SYMPTOM PERSISTENCE	PATIENT SATISFACTION
1	NO	73 months	good	S1	I	NO	YES
2	NO	54 months	excellent	S4	0	NO	YES
3	NO	59 months	fair	S2	III	YES	NO
4	NO	61 months	excellent	S4	0	NO	YES
5	hematoma	63 months	excellent	S4	0	NO	YES
6	NO	58 months	excellent	S4	0	NO	YES
7	NO	50 months	fair	S2	II	YES	NO
8	NO	45 months	excellent	S4	0	NO	YES
9	NO	58 months	excellent	S4	0	NO	YES
10	NO	70 months	excellent	S4	0	NO	YES
11	NO	61 months	good	S3	I	NO	YES
12	NO	68 months	good	S3	I	NO	YES
13	hematoma	62 months	excellent	S4	0	NO	YES
14	NO	53 months	excellent	S4	0	NO	YES
15	NO	43 months	good	S3	I	NO	YES
16	NO	49 months	excellent	S4	0	NO	YES
17	NO	41 months	excellent	S4	0	NO	YES
18	NO	46 months	excellent	S4	0	NO	YES
19	NO	41 months	excellent	S4	0	NO	YES
20	NO	36 months	good	S3	I	NO	YES
21	NO	32 months	excellent	S4	0	NO	YES

Excellent outcome scores in 66.6% of the population



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