SOCIETÀ ITALIANA
G.U.I.D.A.
PER LA GESTIONE UNIFICATA E INTERDISCIPLINARE
DEL DOLORE MUSCOLO-SCHELETRICO E DELL'ALGODISTROFIA

G. Taccardo

ALGODISTROFIA IN CHIRURGIA DELLA MANO

Centro Congressi Unione Industriali
TORINO 11-13 MAGGIO 2023

Hand

Effector of upper limb

High sensibility (pain too)

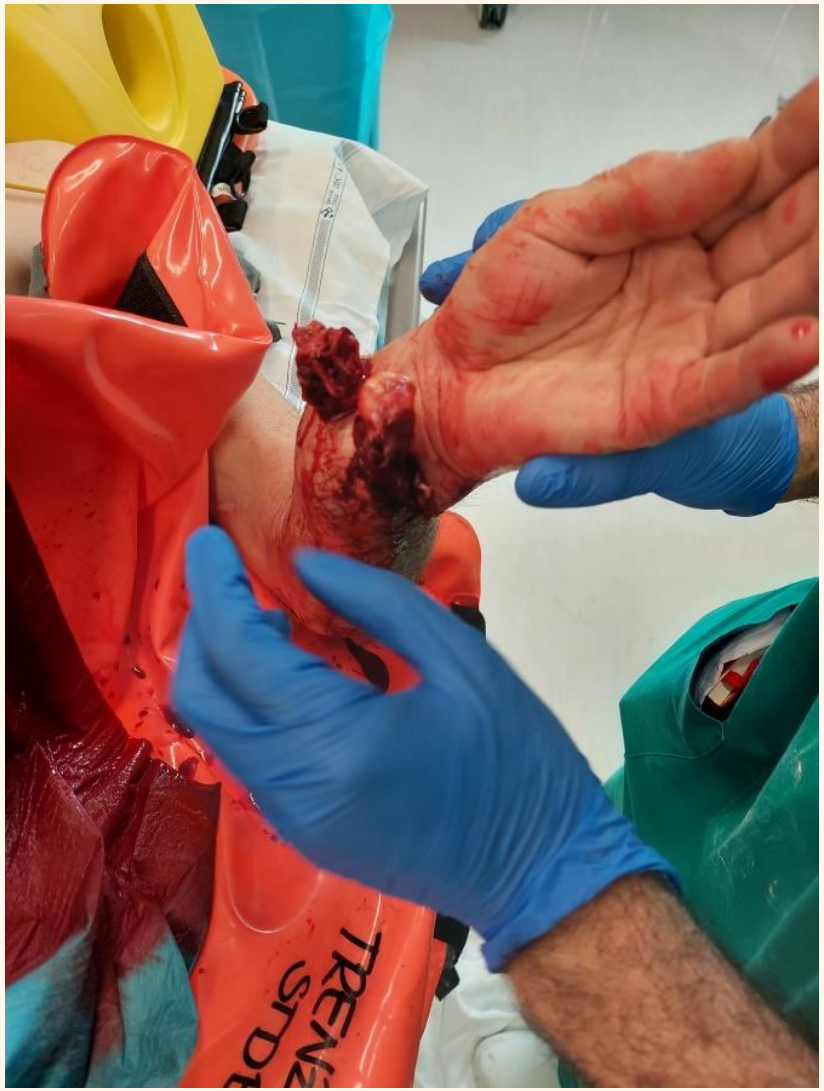
Upper limb involvement

Hand Surgery

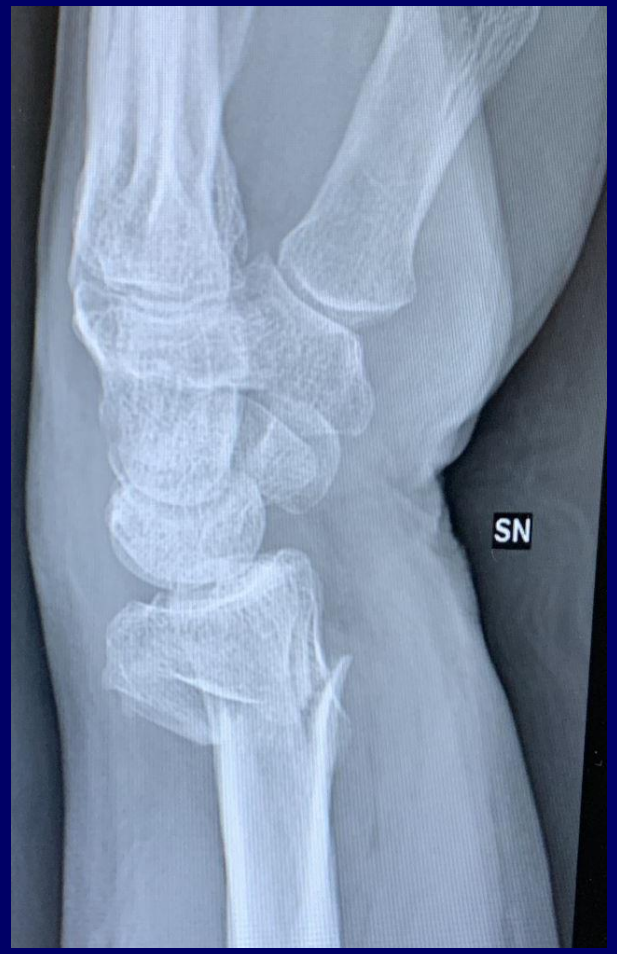
Trauma

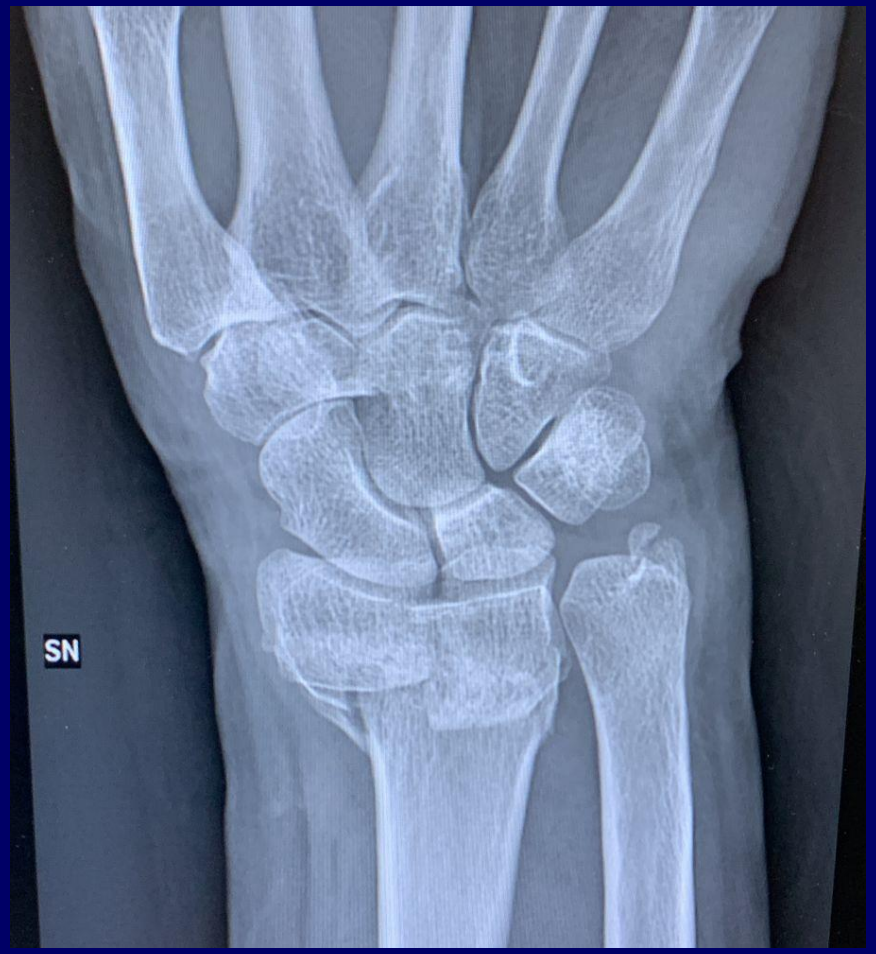
- Fractures (conservative and perioperative)
- Crush
- Nerve injuries
- Loss of substance of fingers
- Complex trauma (several tissues involved

Scheduled surgery

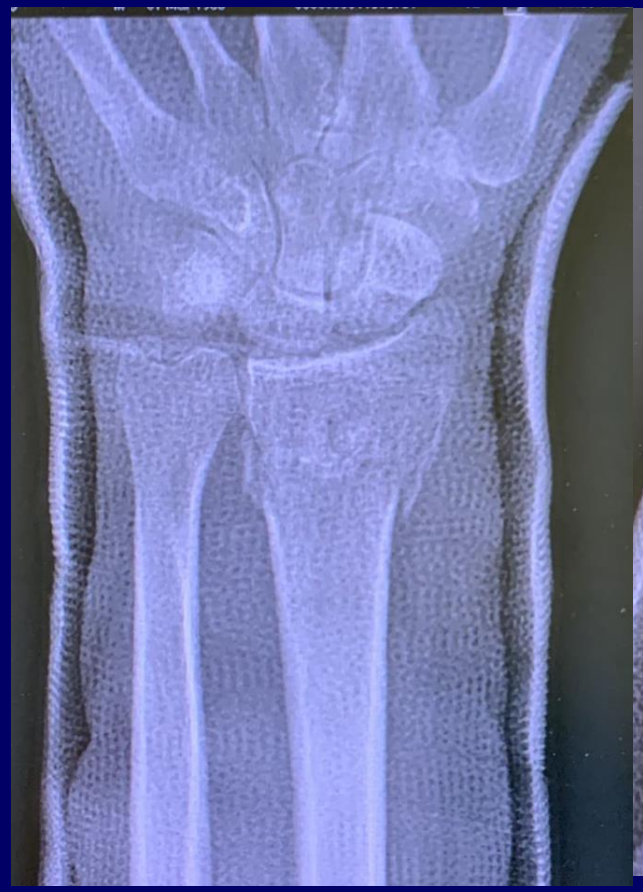


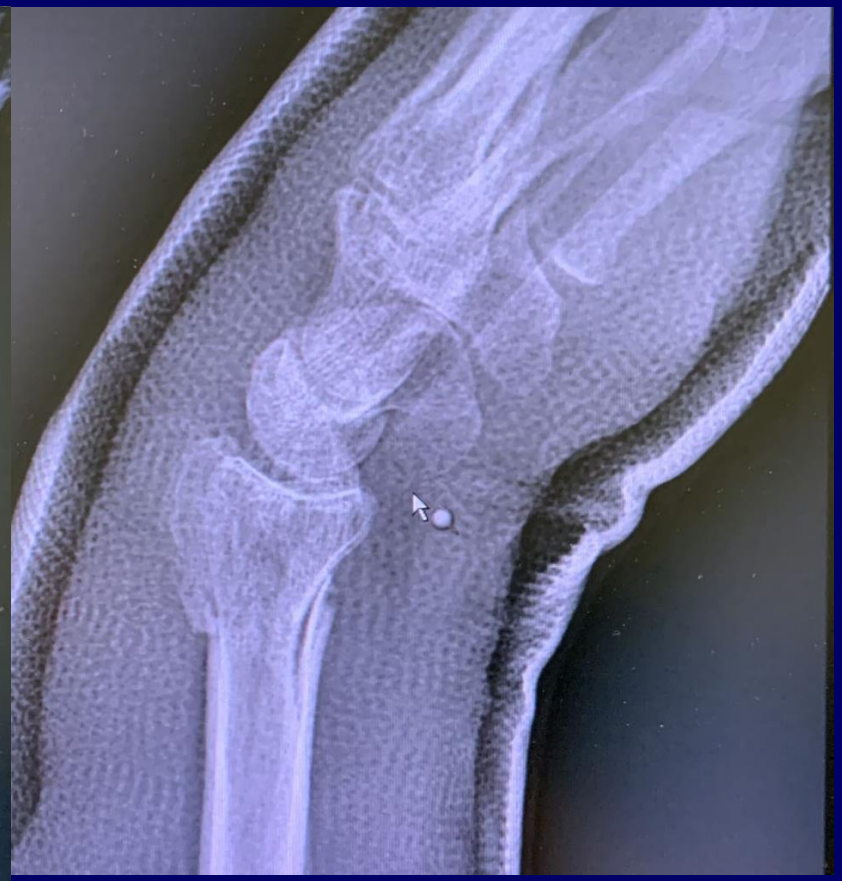
56 years, man
unstable articular fracture





great job, but… but at what price?





we can fail anyway…

Perioperative period

clinically significant osteopenia

delayed bony healing or nonunion

joint stiffness

tendon adhesions

arthrofibrosis

pseudo-Dupuytren palmar fibrosis

swelling

atrophy

Conservative treatment too…

Perioperative hand surgery CRPS

incidence of CRPS is 5.5 to 26.2 per 100,000 person years

prevalence is reported as 20.7 per 100,000 person years

de Mos 2007, Sandroni 2003

Epidemiology

Upper limb > lower limb

Fracture → precipitating event

W>>>M

Post menopause

de Mos 2007

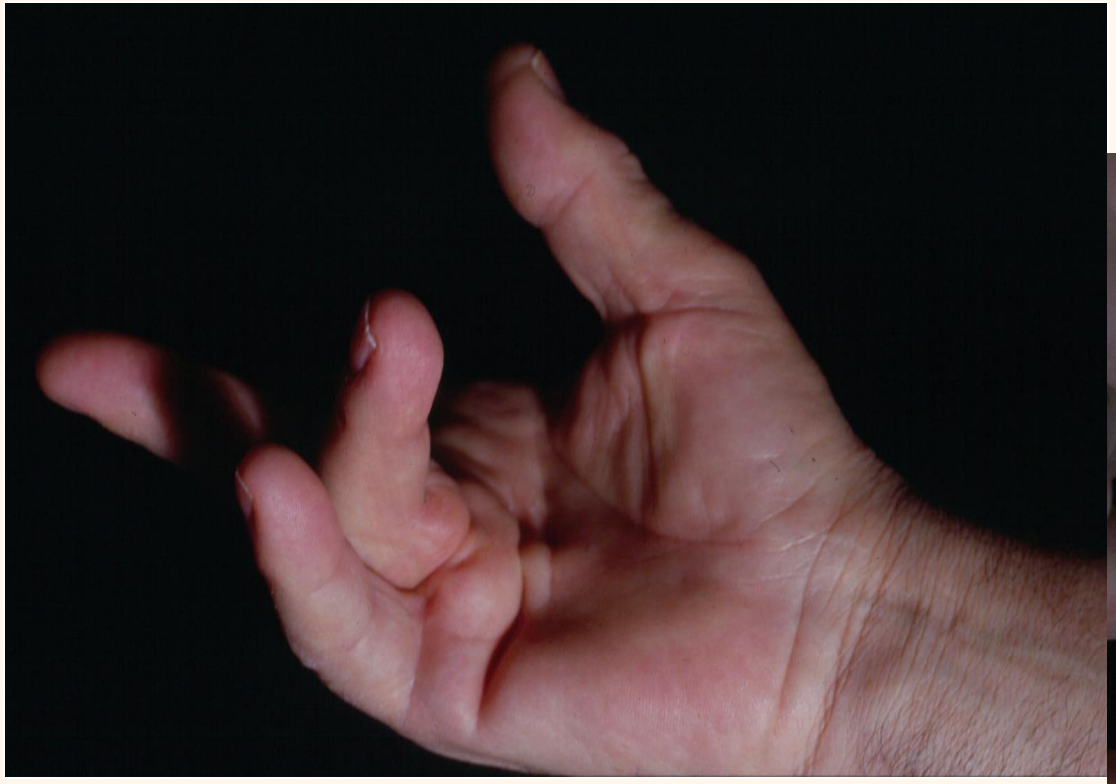
Perioperative hand surgery CRPS

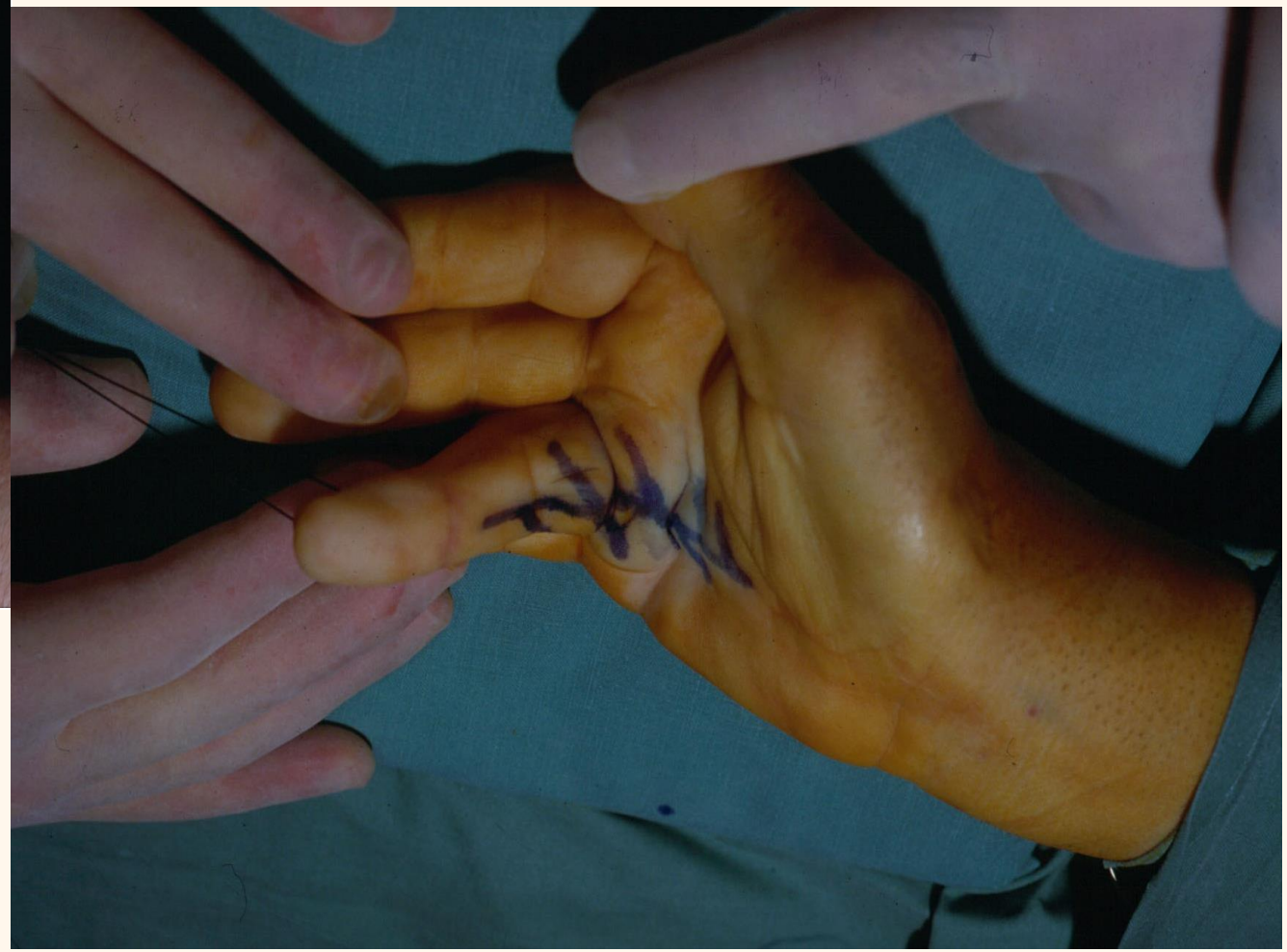
4.5% to 40% after fasciectomy for Dupuytren contracture

2% to 5% after carpal tunnel surgery

22% to 39% after distal radius fracture

Li 2010





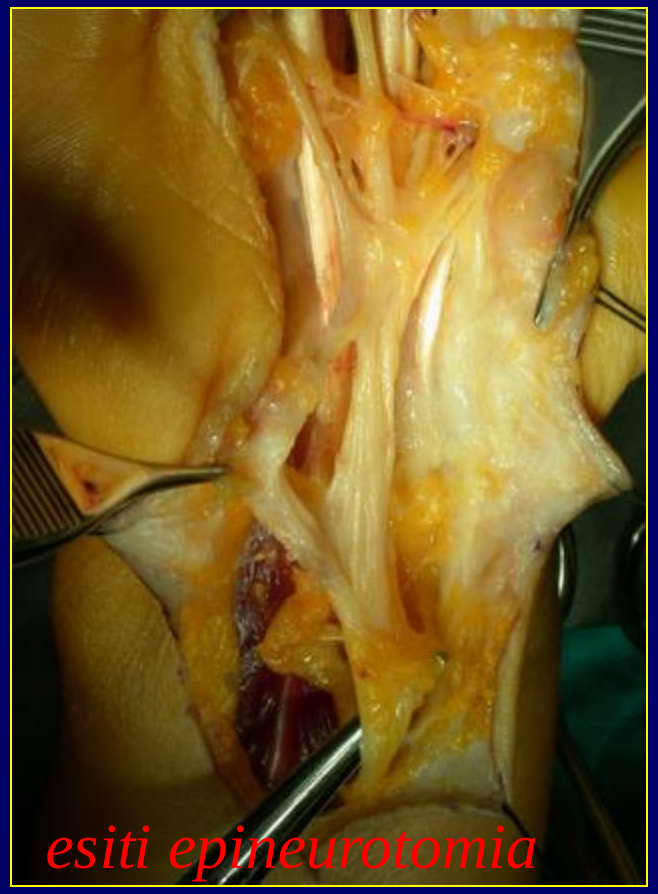
CRPS 1

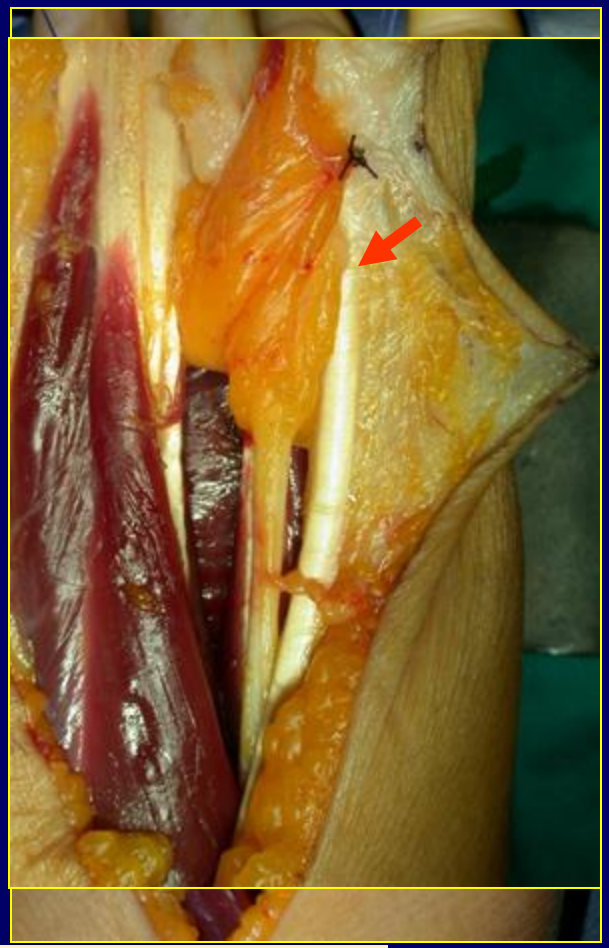
- chronic pain without identifiable nerve involvement

CRPS 2

- chronic pain with nerve involvement → CAUSALGIA

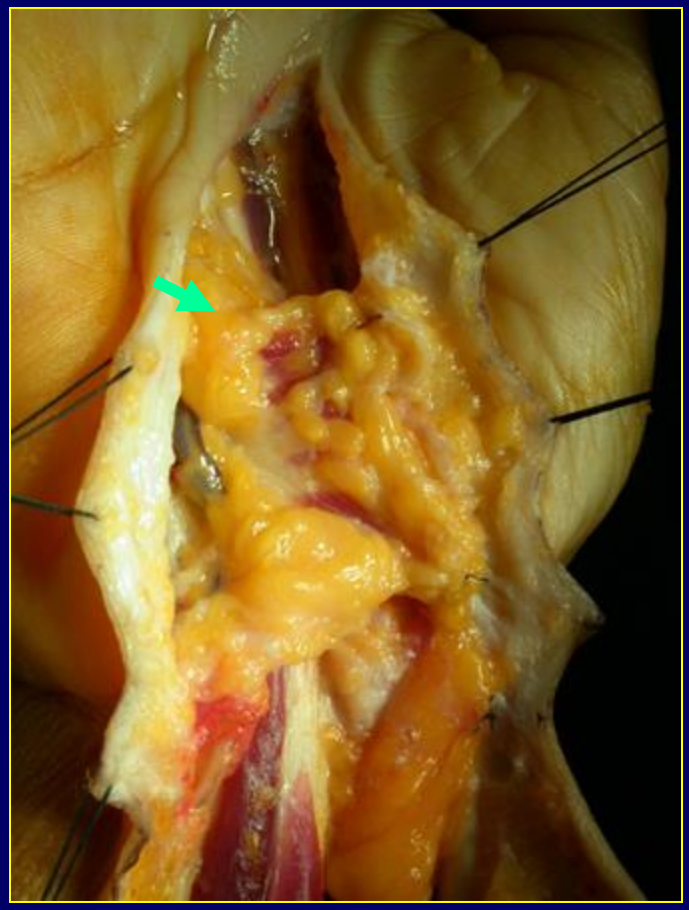
Cover flaps - median nerve protection at carpal tunnel





Taccardo 1997

Lembo a vela quadra



Lembo ipotenare

CRPS 1 + 2

autonomic dysfunction

(abnormal vasomotor activity, inappropriate piloerector activity, abnormal sweat gland activity, and inappropriate arteriovenous shunting) and functional impairment

Onset of CRPS

- pain, numbness, swelling, and stiffness are the normal symptoms reported by most postoperative patients

- burning, throbbing, and searing
- does not respond to narcotics
- awakens patients at night or prevents normal sleep.
- difficulty with rehabilitation programs → described as ‘‘uncooperative.’’
- stiffness, swelling, cold sensitivity, hyperalgesia, and allodynia.
- CRPS is not a psychiatric disease and is not related to any known psychological profile

Perioperative hand surgery CPRS

abnormal prolongation of normal physiologic responses to injury in the periphery, in the spinal cord, and throughout the central nervous system

POTENTIAL FOR IT TO OCCUR IN ANY PATIENT AFTER SURGICAL INTERVENTION

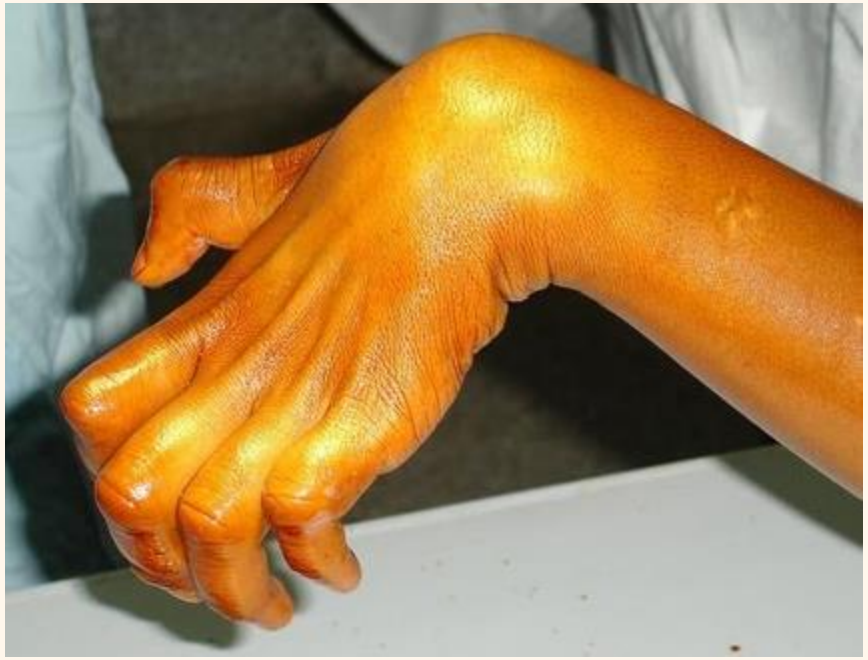
Physical examination

- Tight wound dressings or casts should be avoided.
- assess from the neck to the fingers
- The extremity examination should also assess stiffness, edema, atrophy of hair and nails, hypersensitivity, and dexterity

- exacerbations of preexisting subclinical compression neuropathy should be evaluated by motor examination, sensory testing, and mechanical indications (ie, Tinel signs).
- Nerve injury clinical signs

Inspection

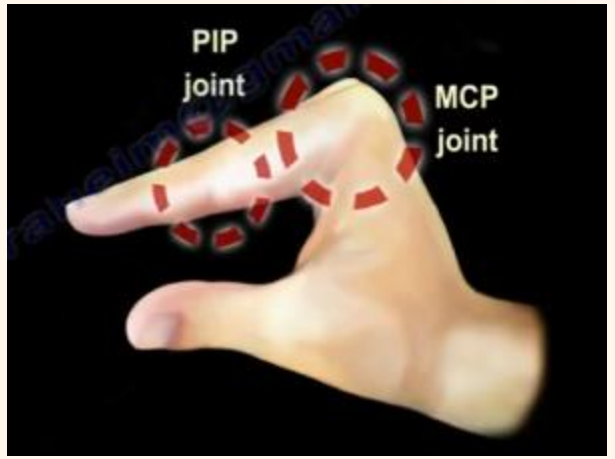
- Swallen
- No dorsal veins
- Dry or damp
- Instrinsic minus
- Exclude surgical complication



Palpation

- Hyperpatia
- Allodynia
- Numbness
- Hyperalgesia

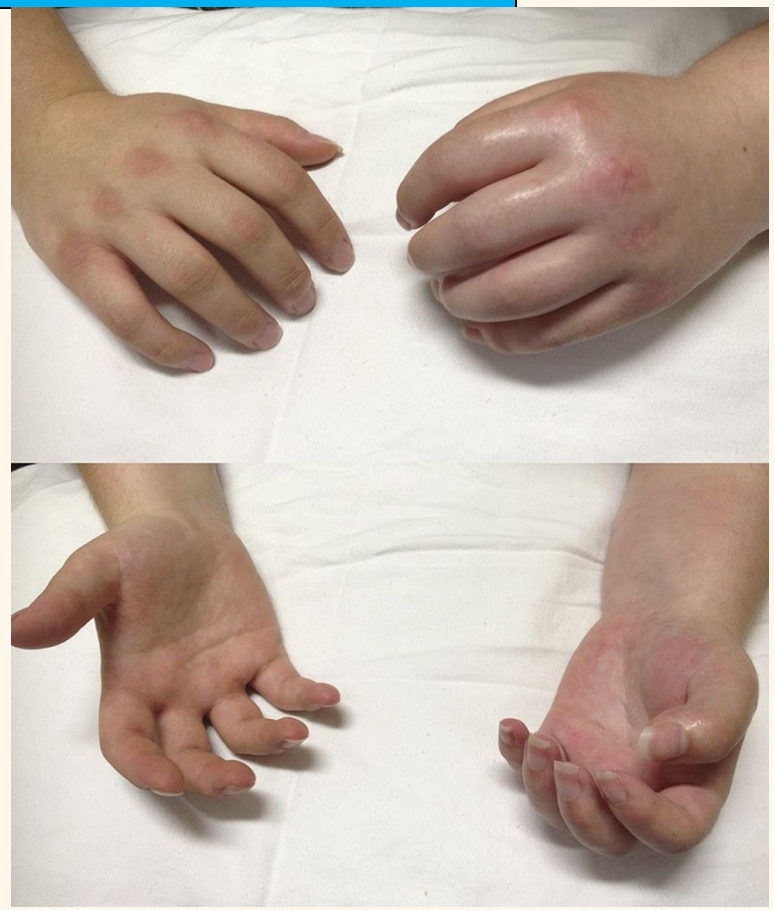
Range of motion (ROM)



- Adhesive capsulitis +++
- Intrinsic muscle contraction (hand)
- Joint stability → nociception +++ (radio ulnar, wrist instability)

Sensibility Examination

- CRPS 2 +++
- allodynia



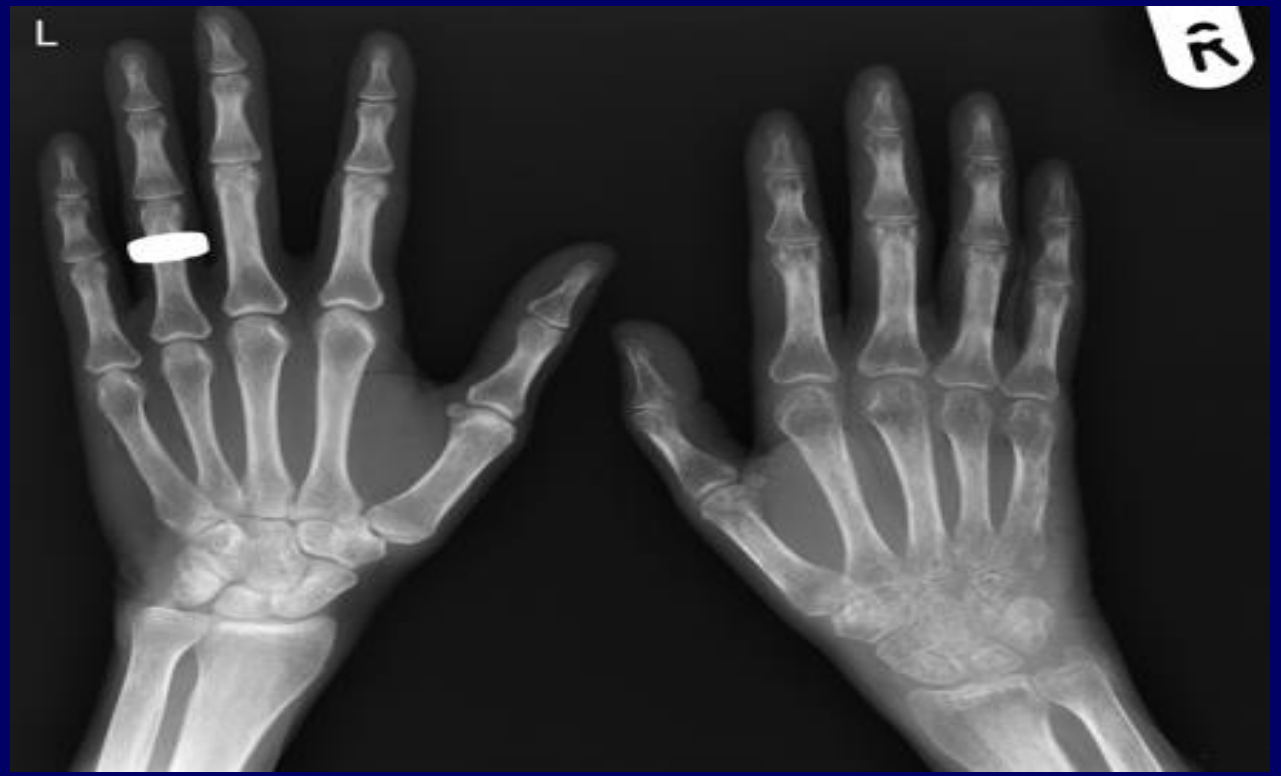
Radiology – 3-phase bone scan

- Lee and Week's (1995) ''a three phase bone scan is not a prerequisite for Complex Regional Pain Syndrome the diagnosis of complex regional pain syndrome.''

- THE DIAGNOSIS IS ALMOST PURELY CLINICAL

Indagini diagnostiche

- rx (osteoporosi-aspetto a vetro smerigliato)



poco costosa

quadro di osteoporosi localizzata

tempo di latenza relativamente lungo ((positivo dopo 3-6 settimane)

può rimanere positiva anche per mesi

- EBM FESSH 2017
- Sistematic review 1966-2017
  - Review of 18 RCTs published from 1966 to 2000 (Forouzanfar at al., 2002).
  - Review of 21 RCTs published from 1980 to 2000 (Perez et al., 2001).
  - Review of 35 RCTs published from 1980 to 2005 (Perez et al., 2010).
  - Review of 41 RCTs published from 1950 to 2009 (Tran et al., 2010).
  - Review of 29 RCTs published from 2000 to 2012 (Cossins et al., 2013).
  - Review of 18 RCTs focused on physiotherapy, published from 1999 to 2014 (Smart et al., 2016).
  - Review of 3 RCTs focused on ketamine infusions, published from 1999 to 2014 (Azari et al., 2012).
  - Review of 12 RCT focused on the efficacy of local anaesthetic sympathetic blocks, published from 2005 to 2015 (O'Connell et al., 2016).

Calcitonine

- β endorfine ↑
- Bone resorption ↓

- Nasal spray, subcutaneous, intramuscular
- ± physiotherapy

- 30% side effects

Biphosphonates

- Seems to work, but…

Need for more trials

- There is not strong evidence for the efficacy of bisphosphonates, with no high-quality trials (EBM FEESH 2017)

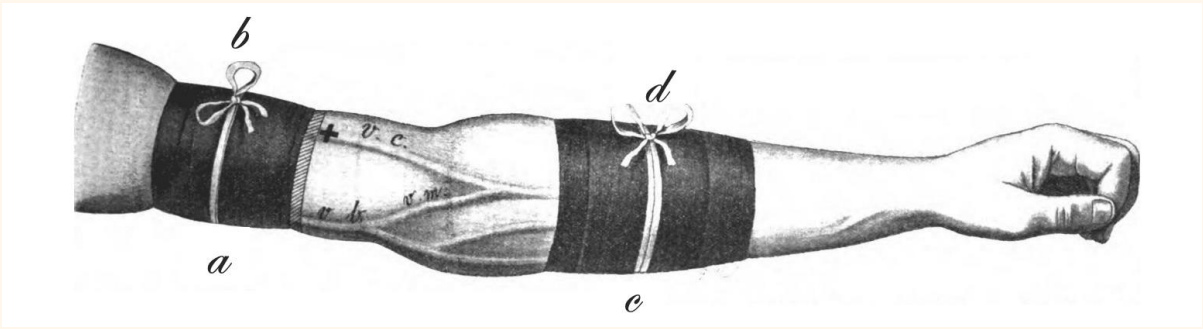
Free radical scavengers

- There is moderate evidence for the effectiveness of topical 50% dimethyl sulfoxide (DMSO) cream in reducing the symptoms of early CRPS. Likewise, there is moderate evidence for the effectiveness of oral N-acetylcysteine in reducing the symptoms of chronic CRPS. Free radical scavengers have been used frequently in clinical practice, mostly in the Netherlands.

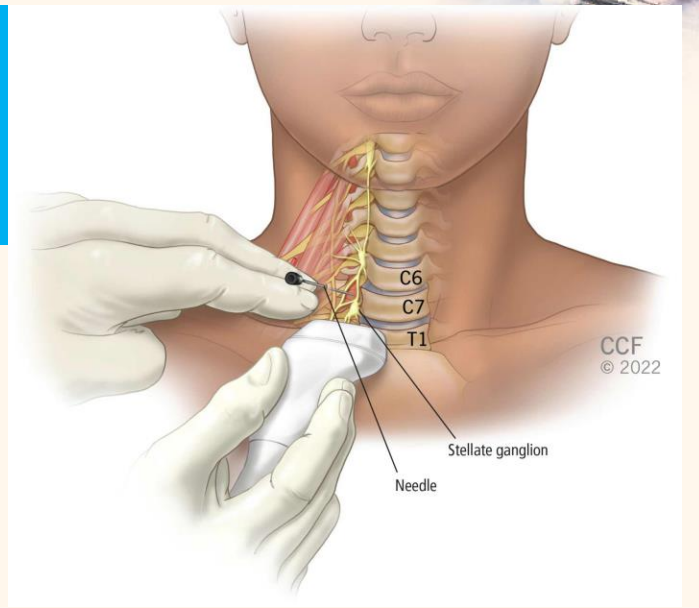
- All studies combined with physiotherapy.

Bier block

- *The treatment consisted of 2-4 blocks administered at weekly intervals.*
- *In all studies drug therapy was combined with formal physiotherapy*
- *Hard to apply…*



Sympathetic ganglion blocks



- One high-quality RCT involving 43 patients
- Likewise with intravenous regional sympathectomy, there is relatively weak evidence supporting the effectiveness

Steroids

- Antinflammatory (similar free radical scavengers)
- weak evidence → frequently used in clinical practice

Anticonvulsivant

- Gabapentin
- There is moderate evidence for the effectiveness of gabapentin reducing some of the pain symptoms (including hyperaesthesia and allodynia) in CRPS patients

unico trattamento riconosciuto

NERIDRONATO 100 MG (VARENNA E AL. 2013)

Schema infusione

100mg x 4 nell'arco di 10 giorni

Neridronato 25 mg

Schema infusione

?

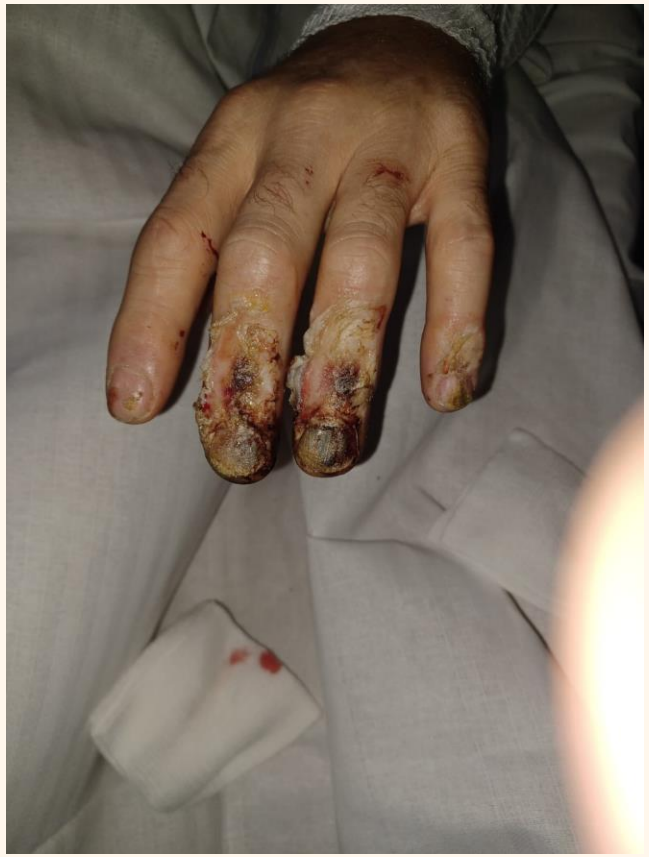
Physiotherapy

- There is moderate evidence of effectiveness of motor imagery (GMI) and mirror therapy in CRPS, however, a type II error is likely to be present.
- Physiotherpay in general is likely to have a positive effect on the impairment level in patients with chronic CRPS but less effect on pain reduction.
- It is commonly accepted as a part of the standard treatment of CRPS

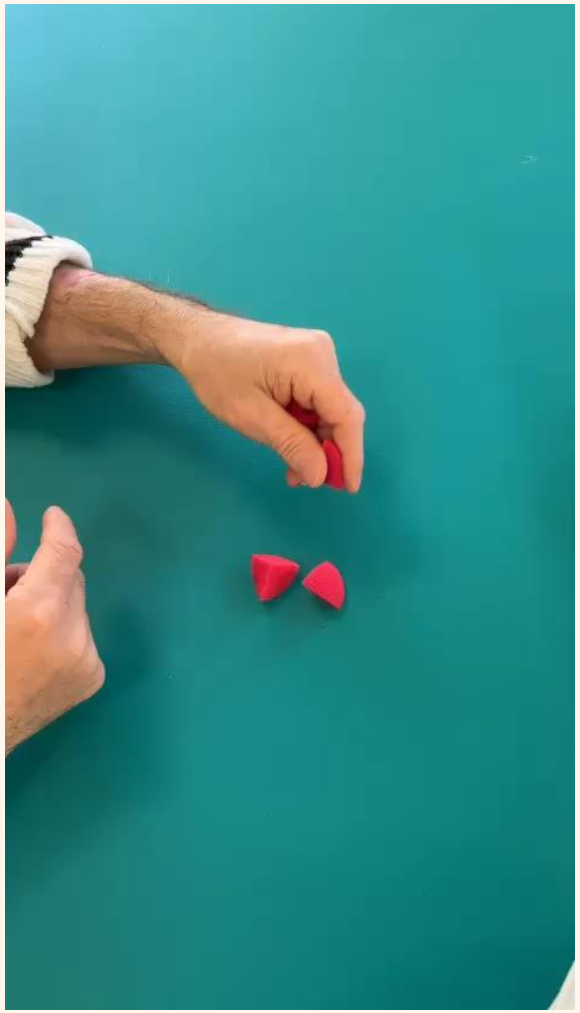
Hand

- Effector of upper limb
- High sensibility (pain too)
- Upper limb involvement

Burns 3 grade

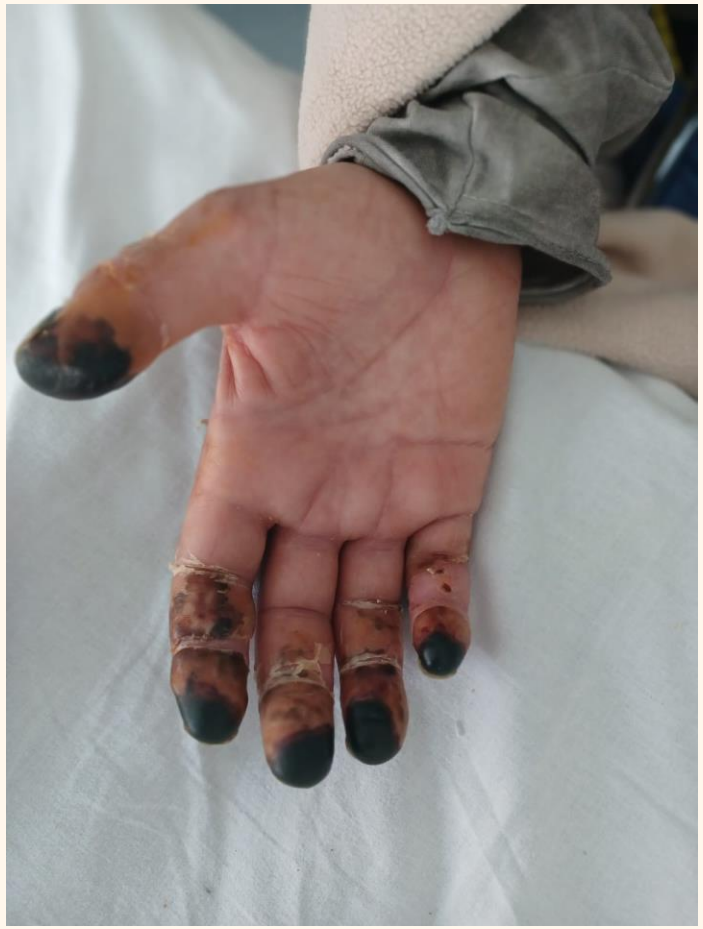


4 months FU

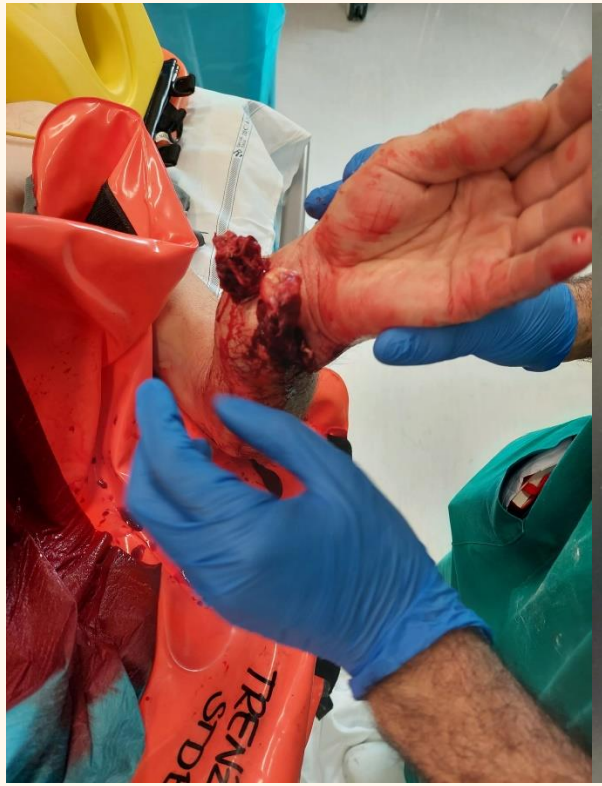


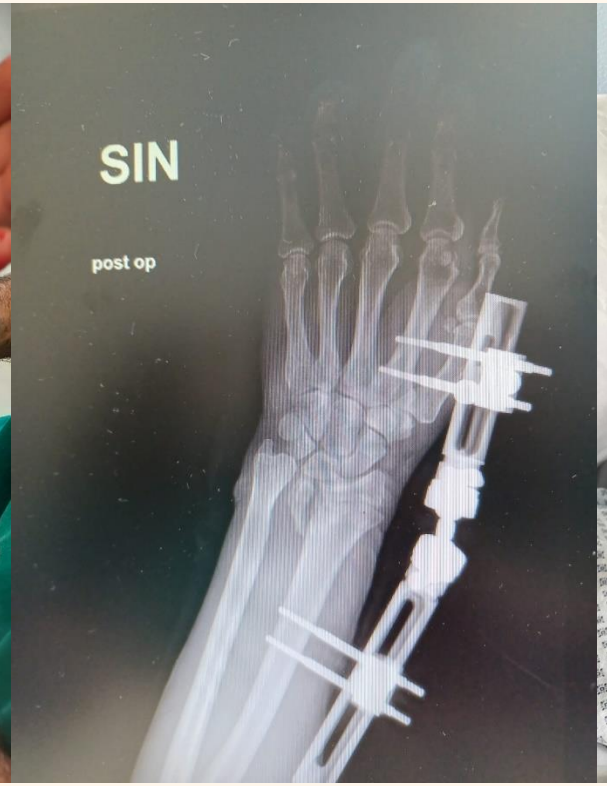
Cold burns

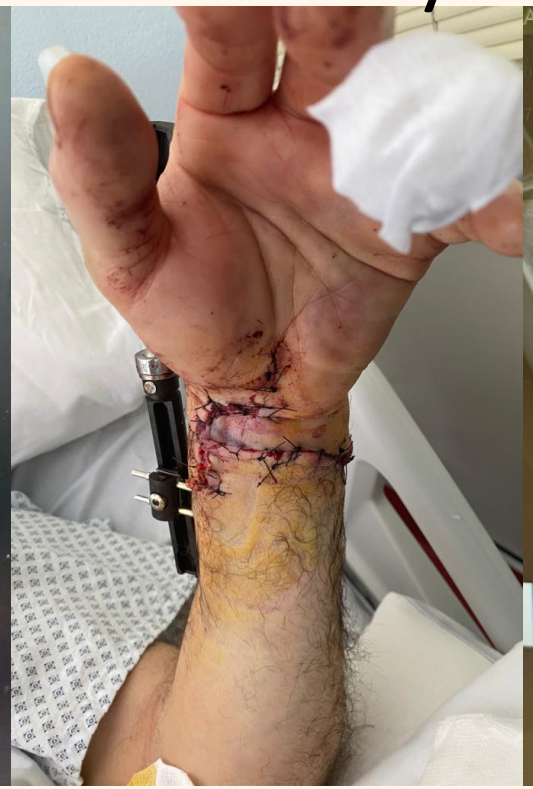
6 months FU

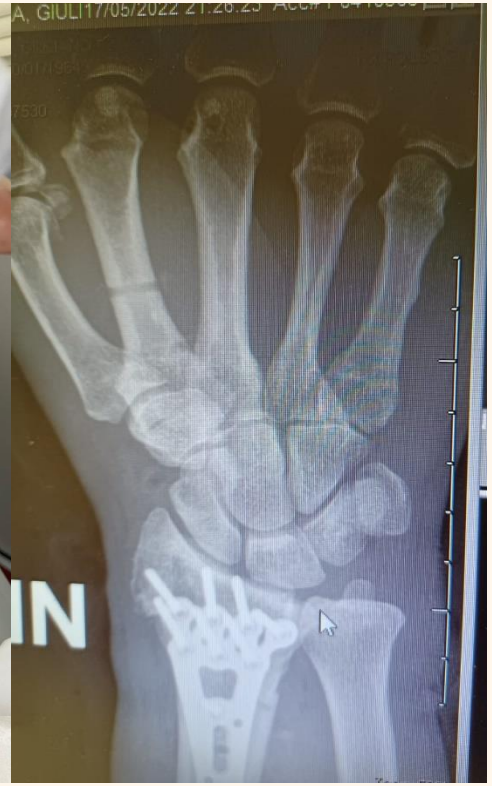


Open fracture with avulsion of ulnar head and radial artery









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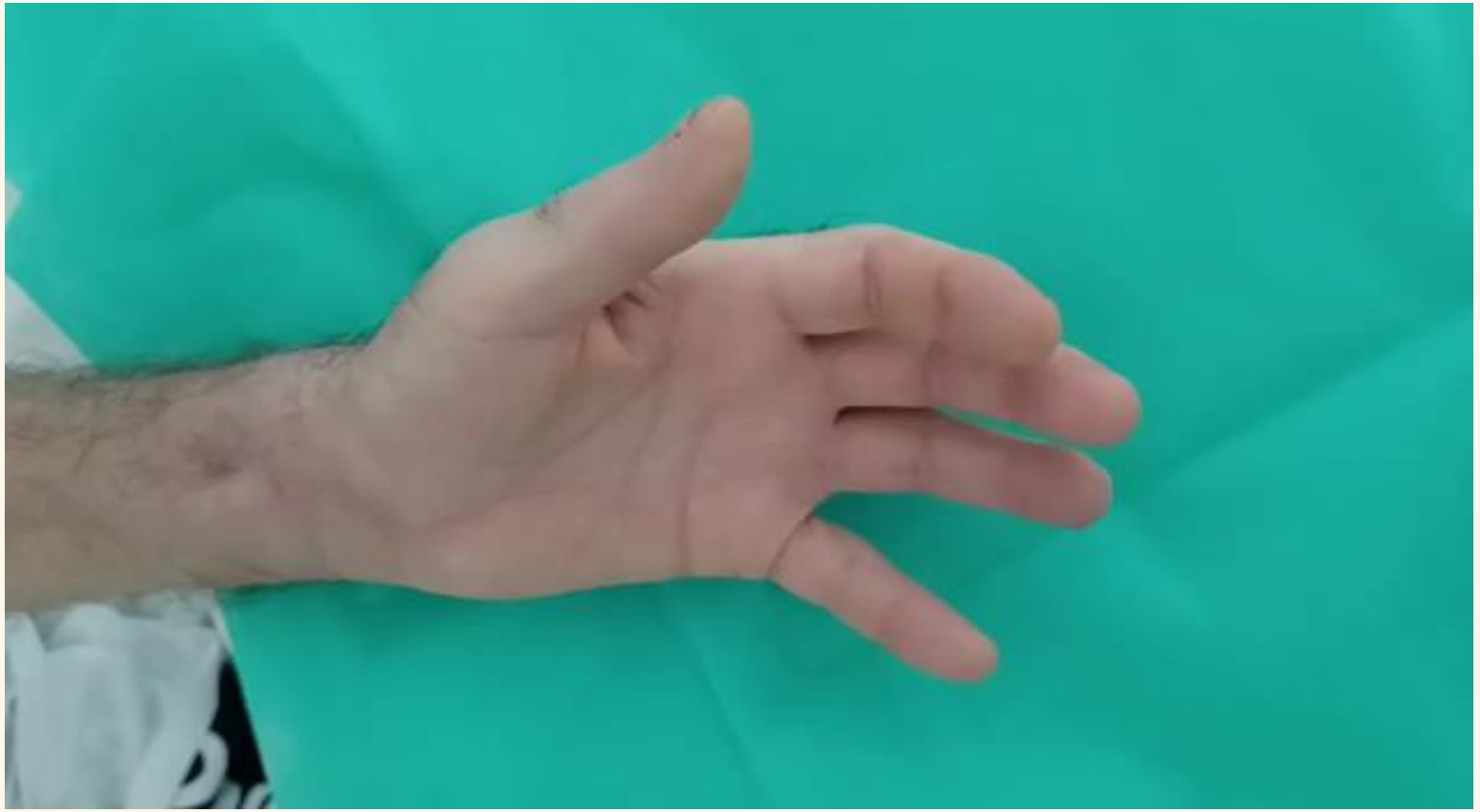


my one-year experience (2019)

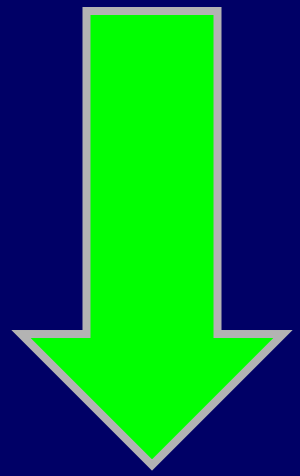
- 713 surgical procedures in hand surgery
  - 498 elective surgery
  - 215 trauma surgery
- 32 patients lost at follow-up

- Total: 681 patients
  - 52 → symptoms referable to onset of CRPS
  - 45 → Neridronate 25 mg x4 IM (within 3 months from surgery) → 6.6%

  - 32 non surgical patients → Neridronate 25 mg x4 IM

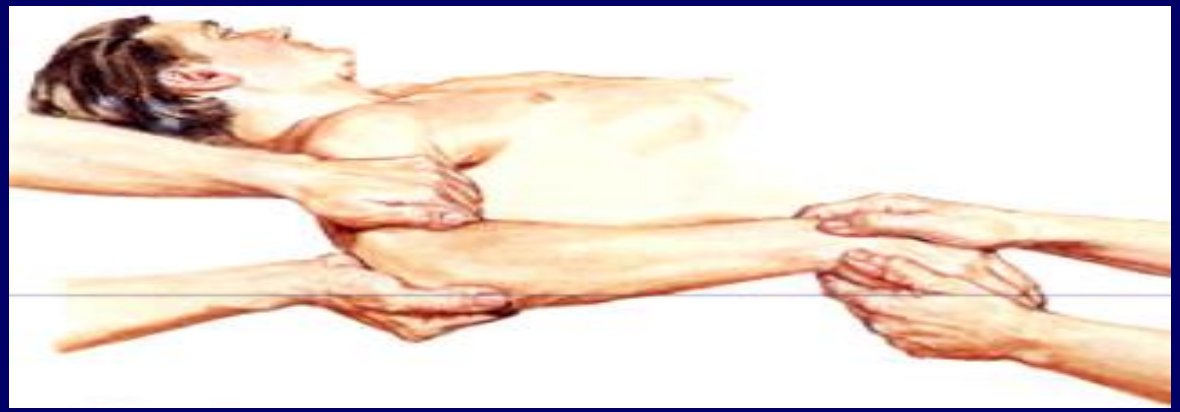
- All recovered within 2 years

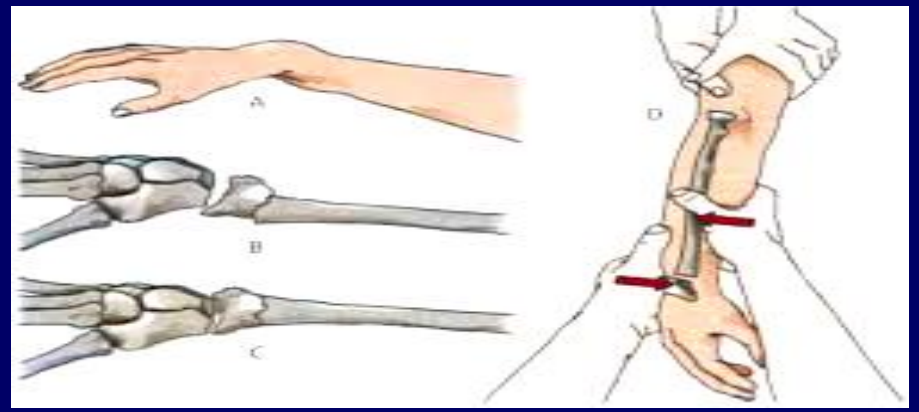
obiettivo primario

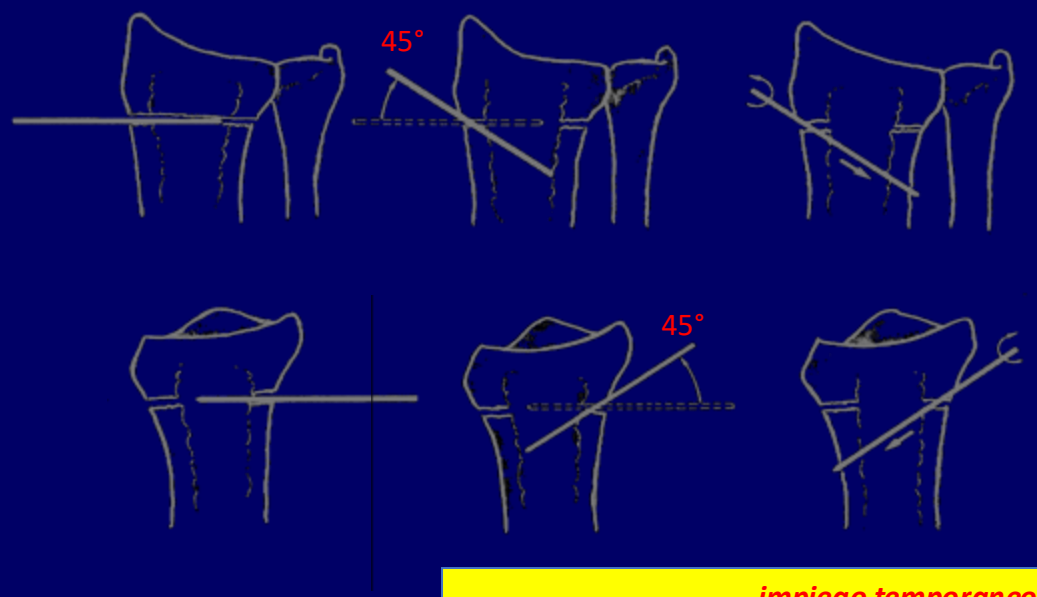


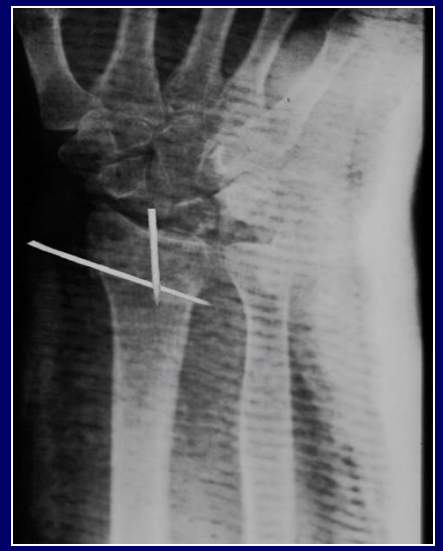
prevenzione

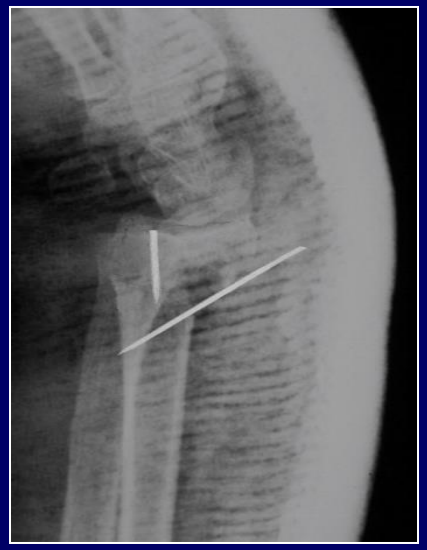
Apparecchio gessato

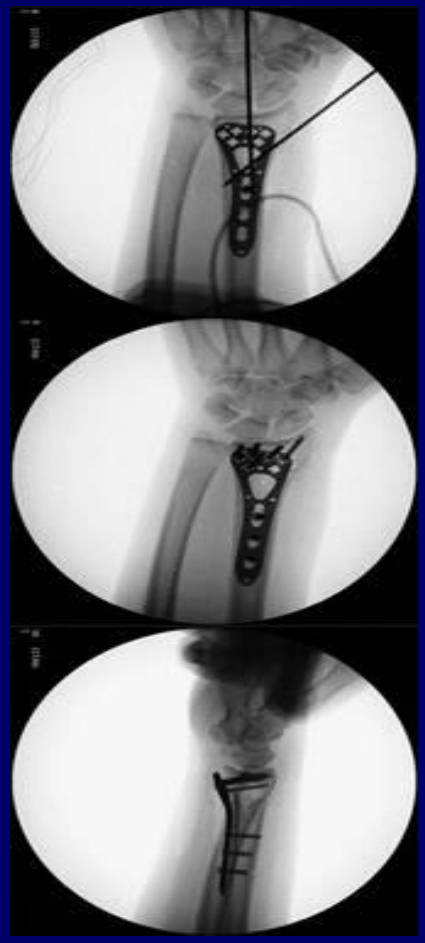












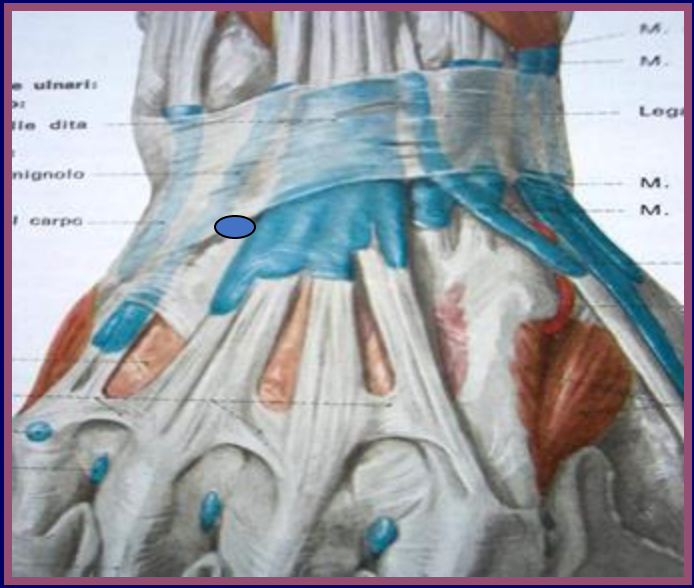
impiego temporaneo durante la sintesi con placca volare

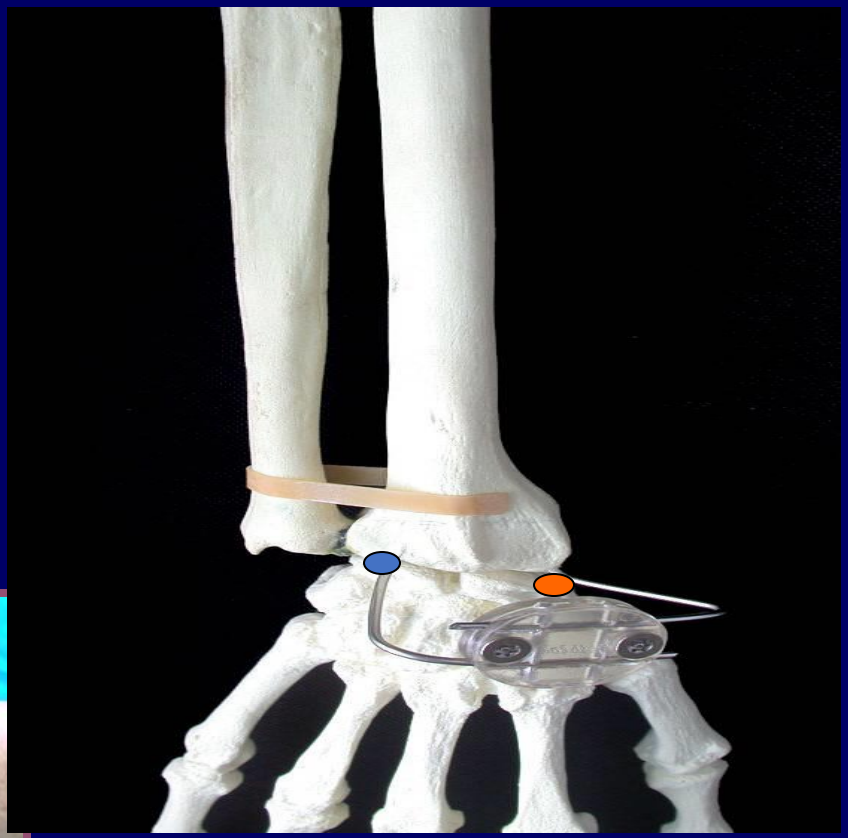
Tech Hand Up Extrem Surg. 2019 Mar;23(1):38-43. doi: 10.1097/BTH.0000000000000221.

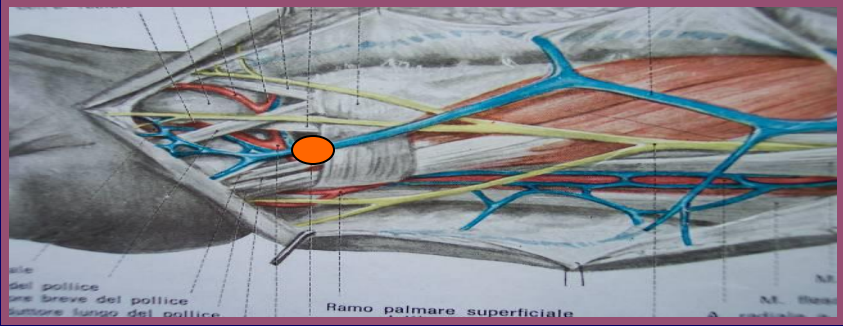
Outcomes Following Temporary Kapandji Pinning Technique and Distal Radial LCP Fixation for Intra-Articular Fractures of the Displaced Distal Radius.

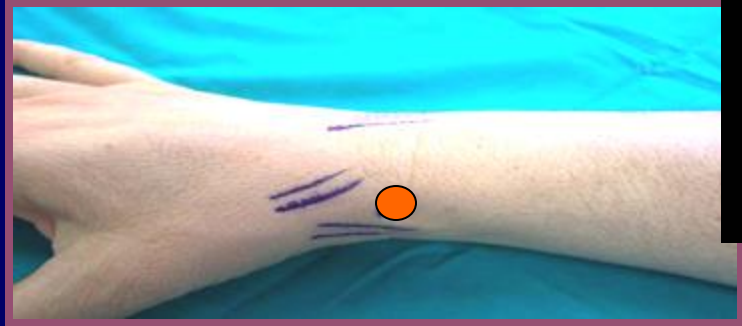
Jirangkul P[1], Jitprapaikulsarn S[2], Songpatanaslip T[1].

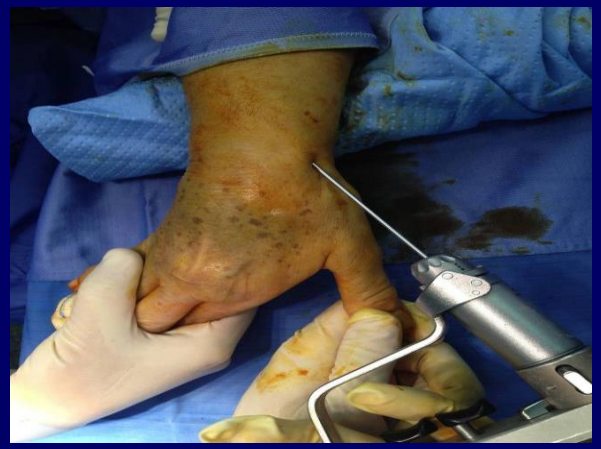
OSTEOSINTESI ENDOMIDOLLARE ELASTICA

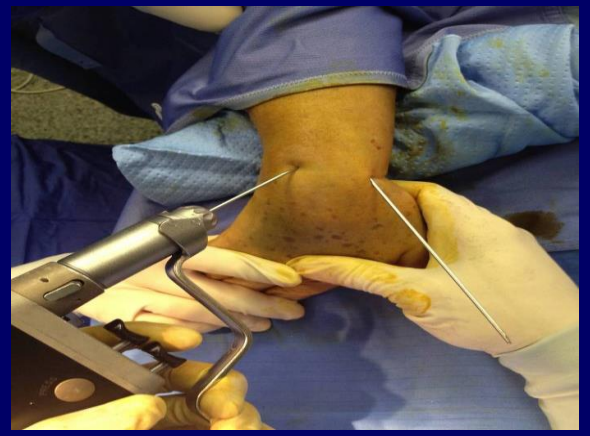


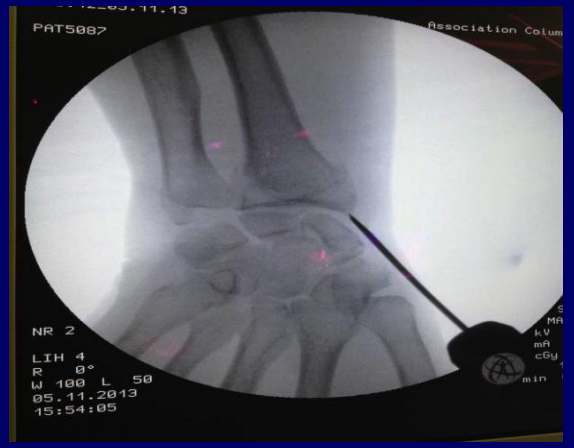








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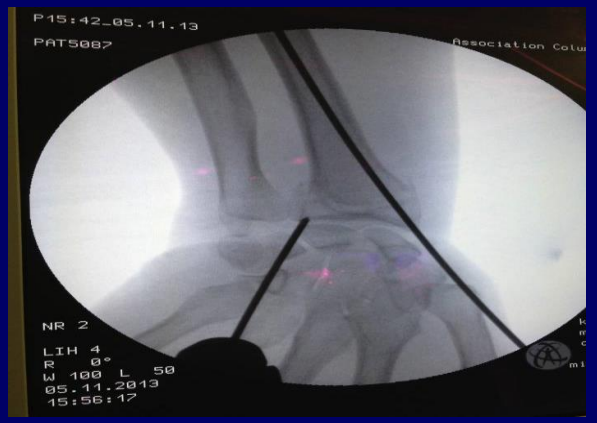
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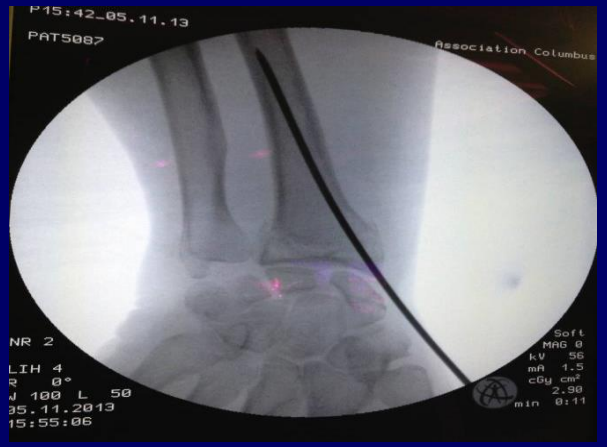
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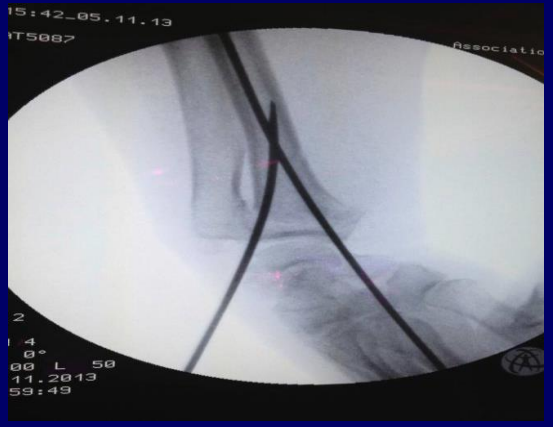
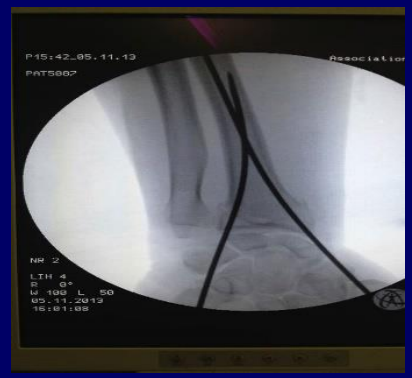
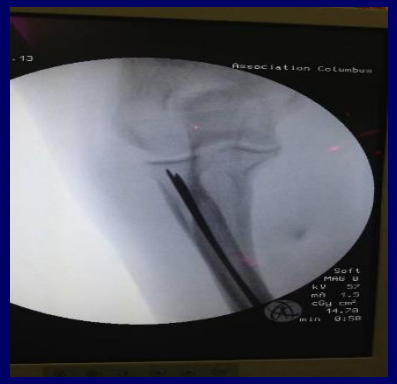
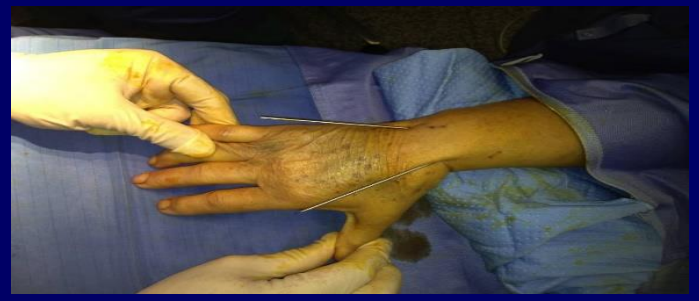
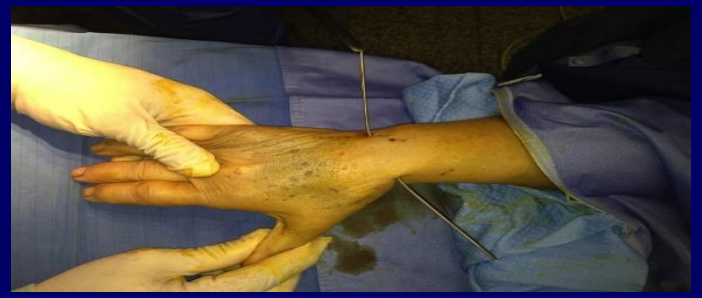
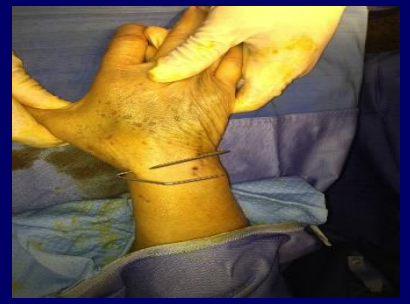


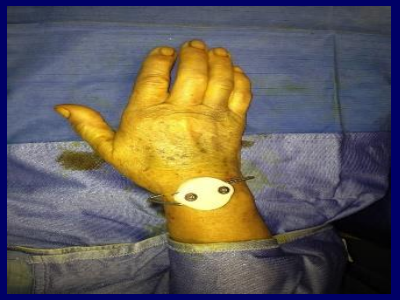


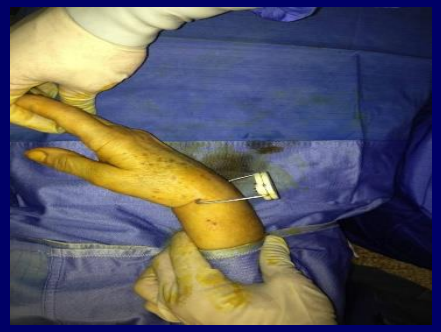


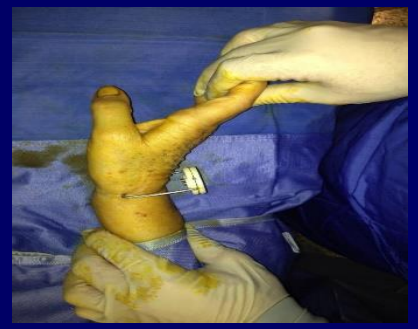


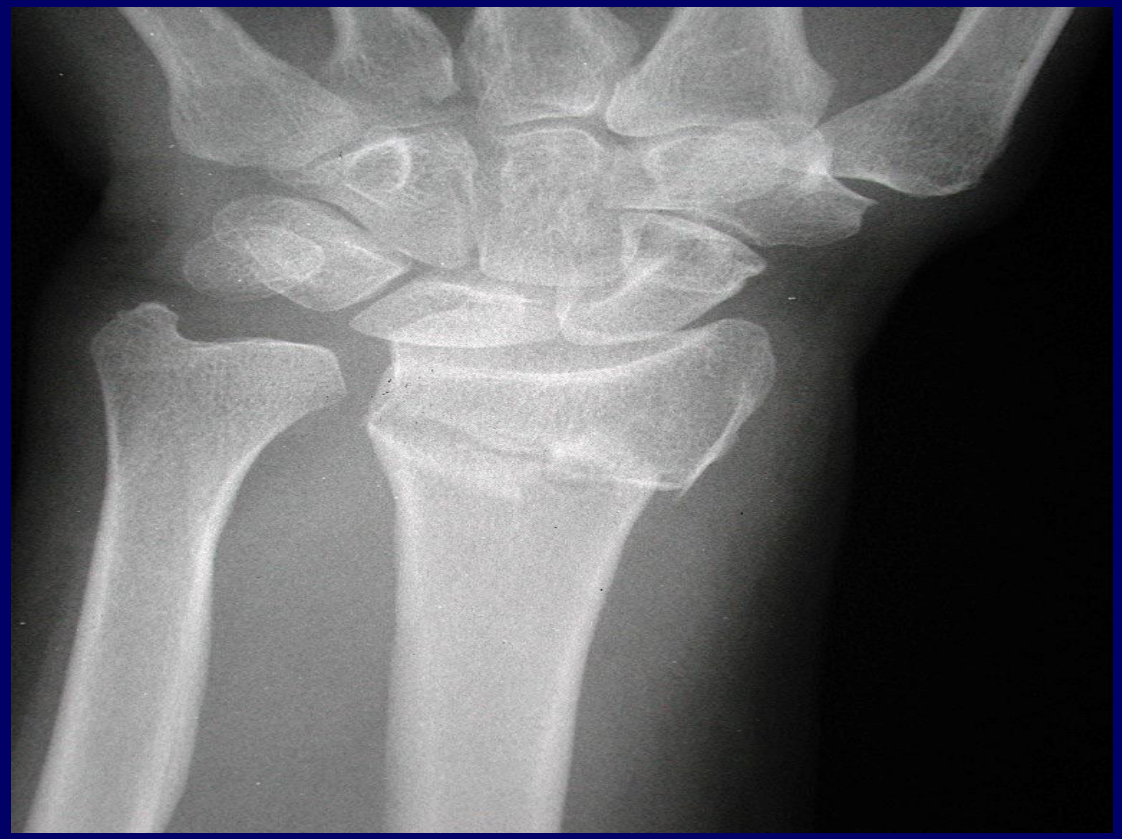


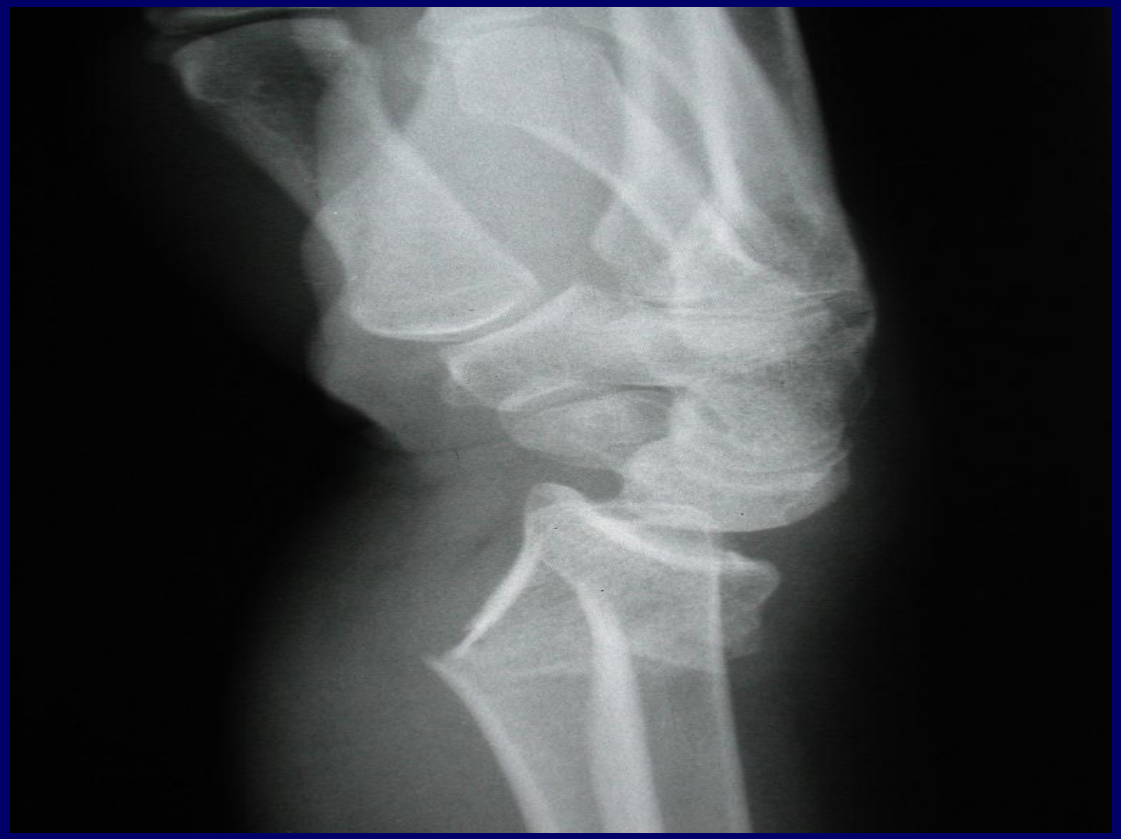


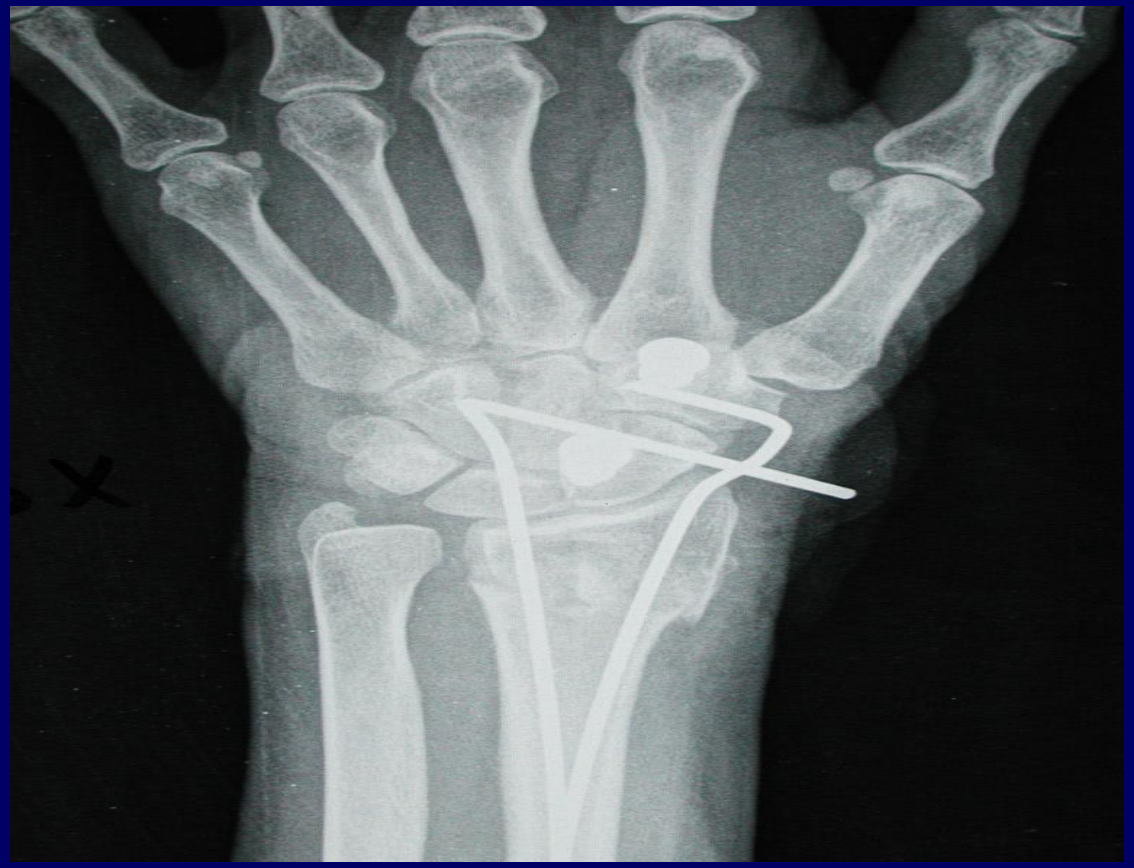


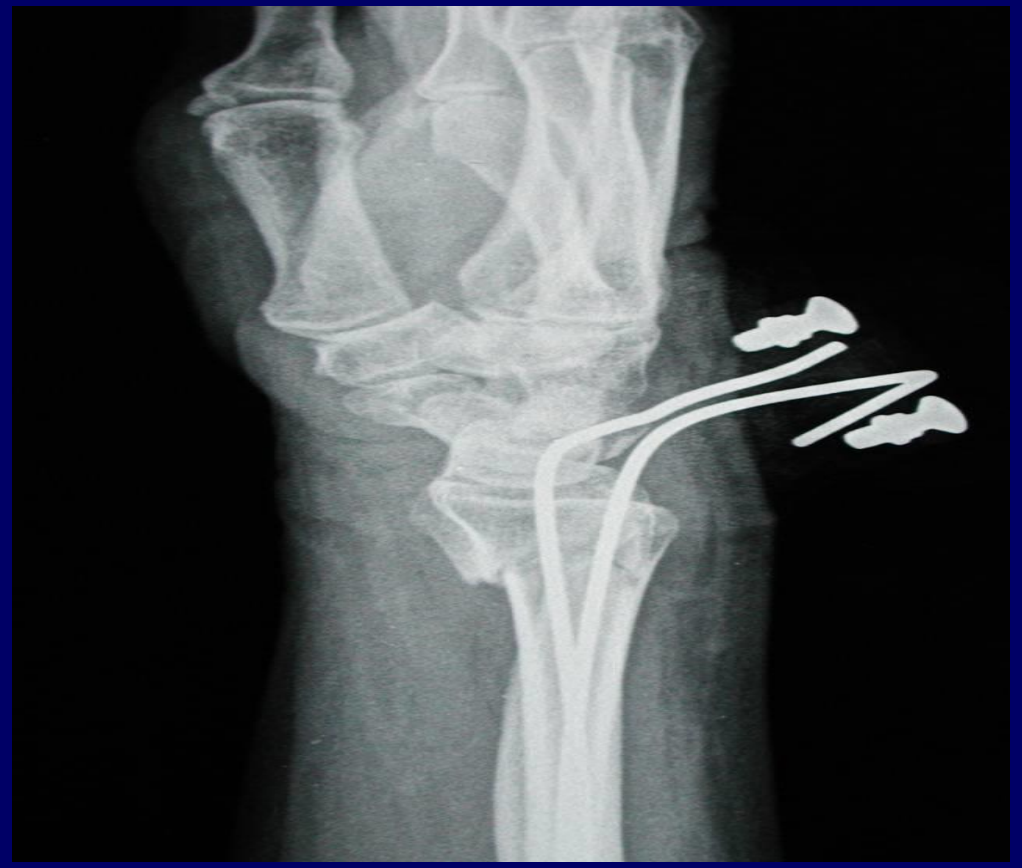












Controllo a 15 gg




Controllo a 40 gg

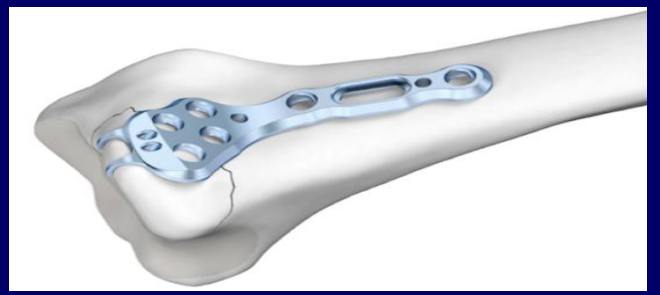


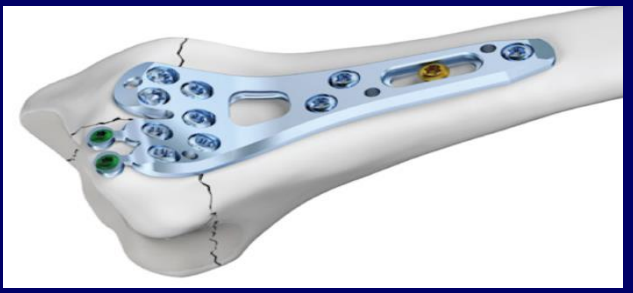

Controllo a 60 gg

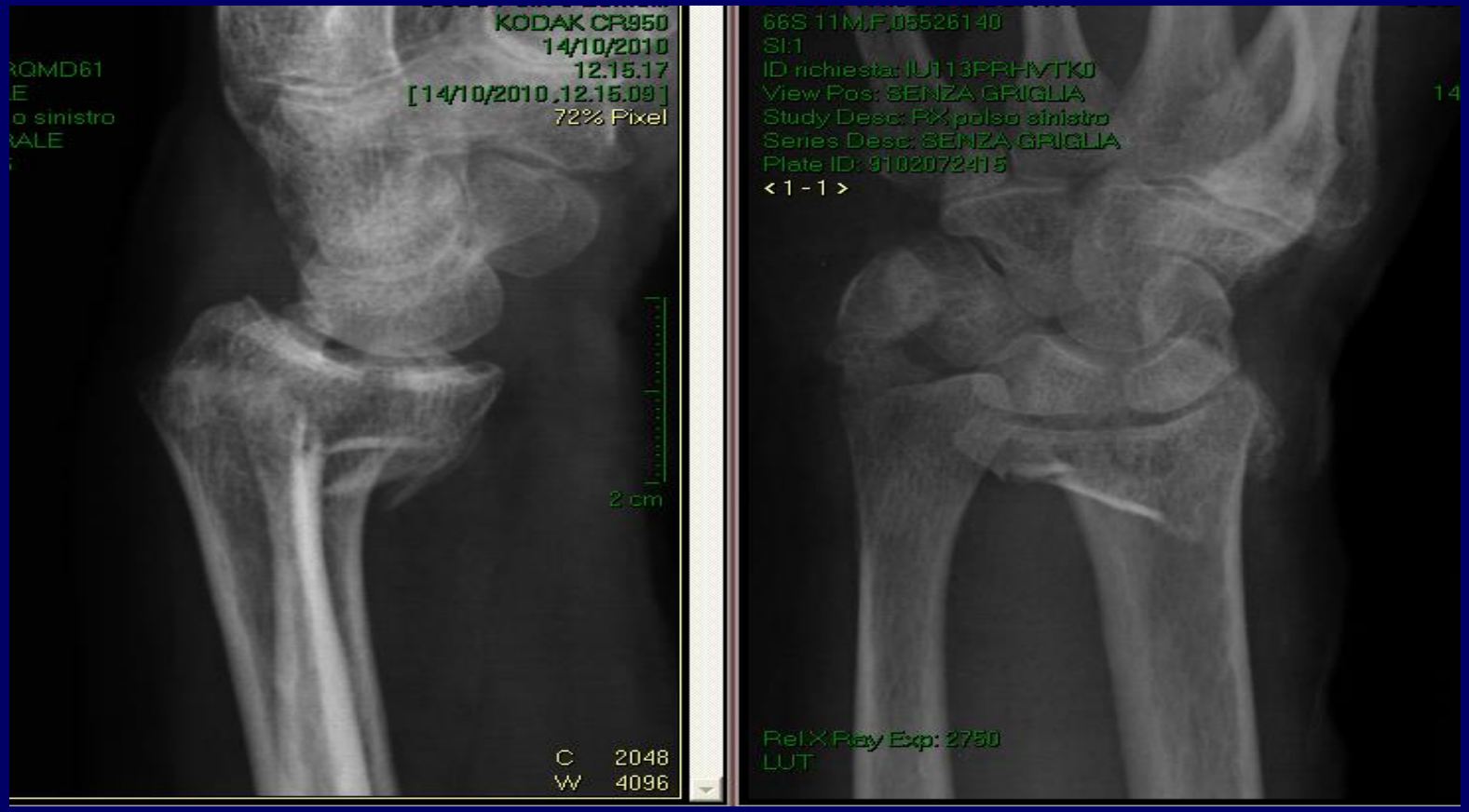


Screw Driver
Depth Measuring Gauge
Plate Holding Instrument
Screw Driver


1.5 SpeedTip
Hook plate, two holes
Hook plate, four holes



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14/10/2010
12.15.17
[14/10/2010,12.15.09]
72% Pixel
2 cm
C 2048
W 4096
66S 11M,F,05526140
SI:1
ID richiesta: IU113PRHVTK0
View Pos: SENZA GRIGLIA
Study Desc: PX polso sinistro
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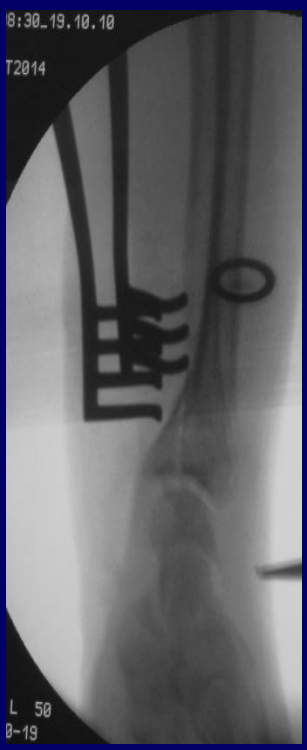
LUT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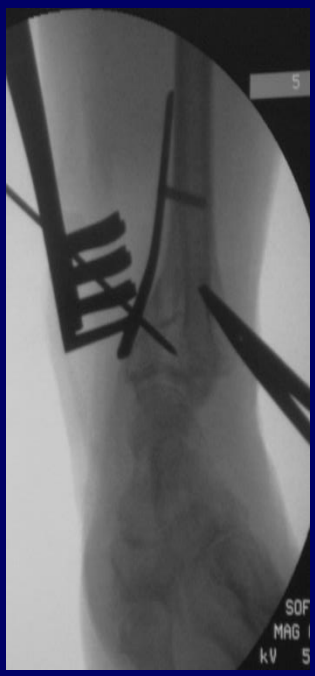
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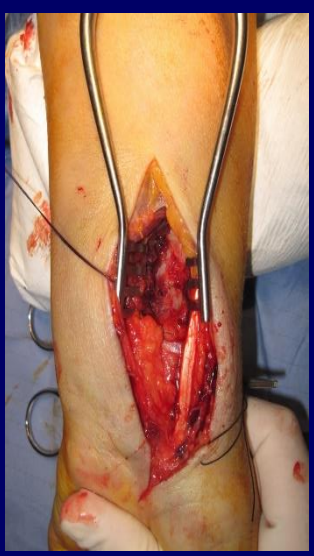
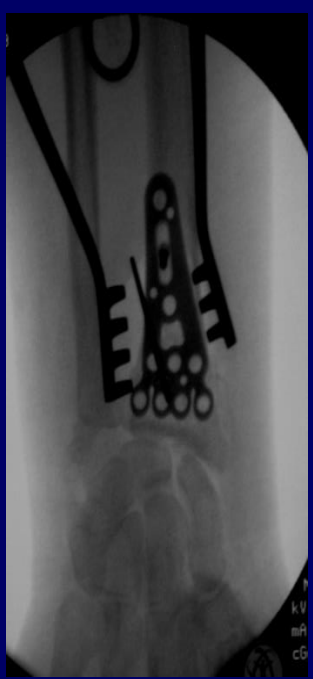
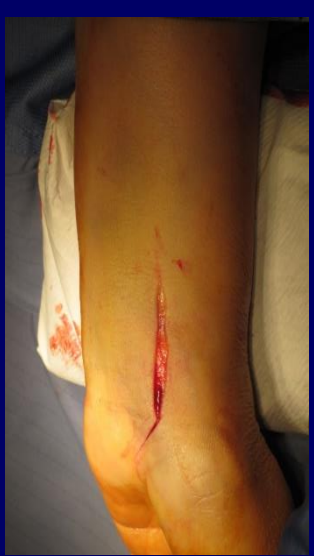
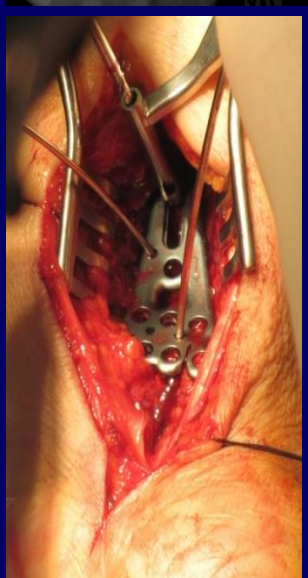
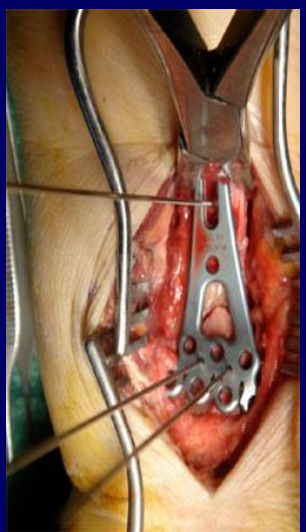
SOF
MAG
kV 5











SN
S.OP.

SN
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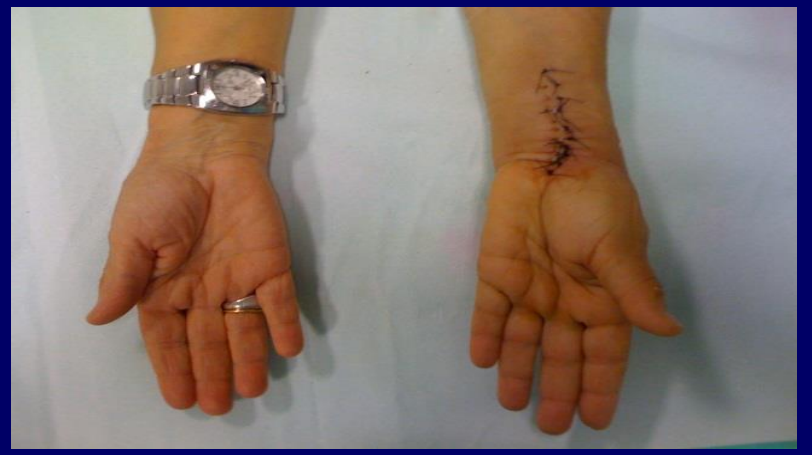
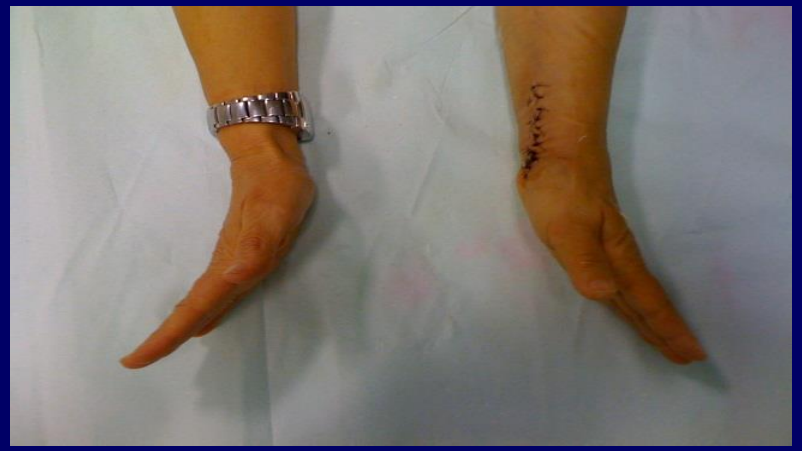
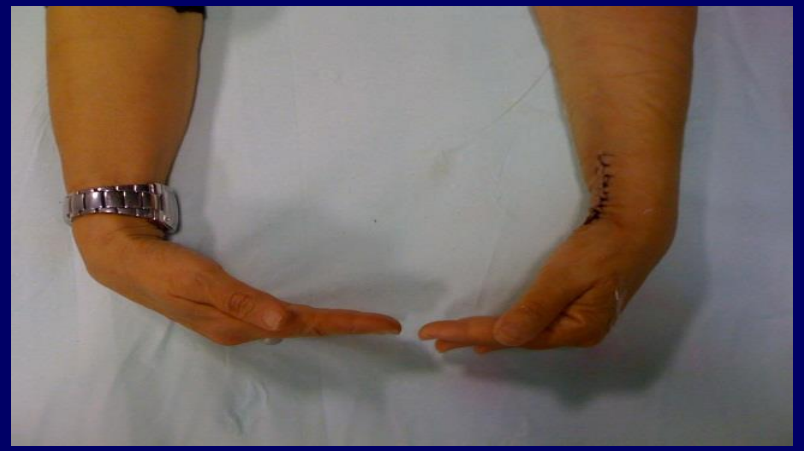
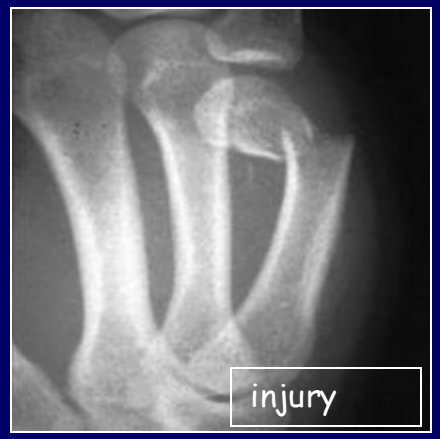




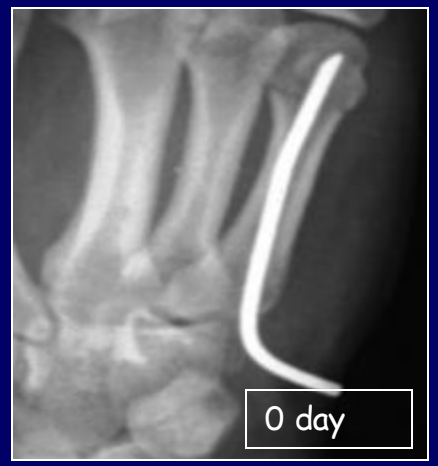


le fratture dei metacarpi

osteosintesi percutanea endomidollare anterograda

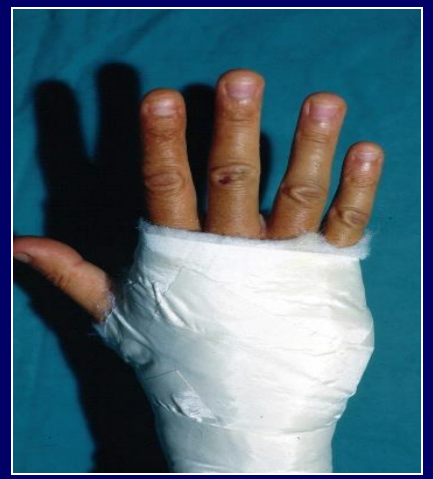


~ 6,5 days



closed reduction
and stabilization

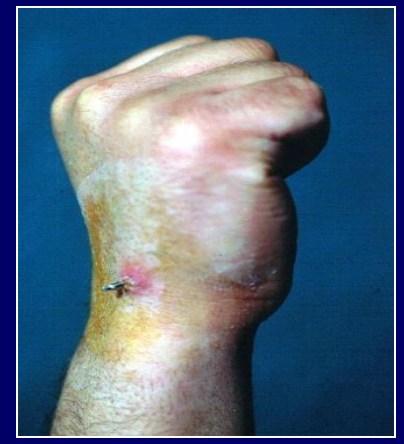
1th day

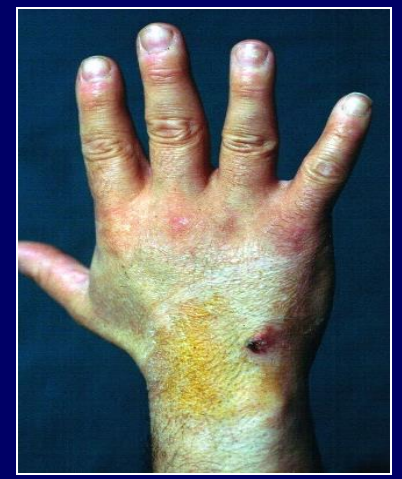


no splint immobilization
immediate mobilization

Weekly dressing
X-ray assessment on 7th day

35th-45th day





X-rays assessment
removal of device

S. M. anni 39 professione: fabbro

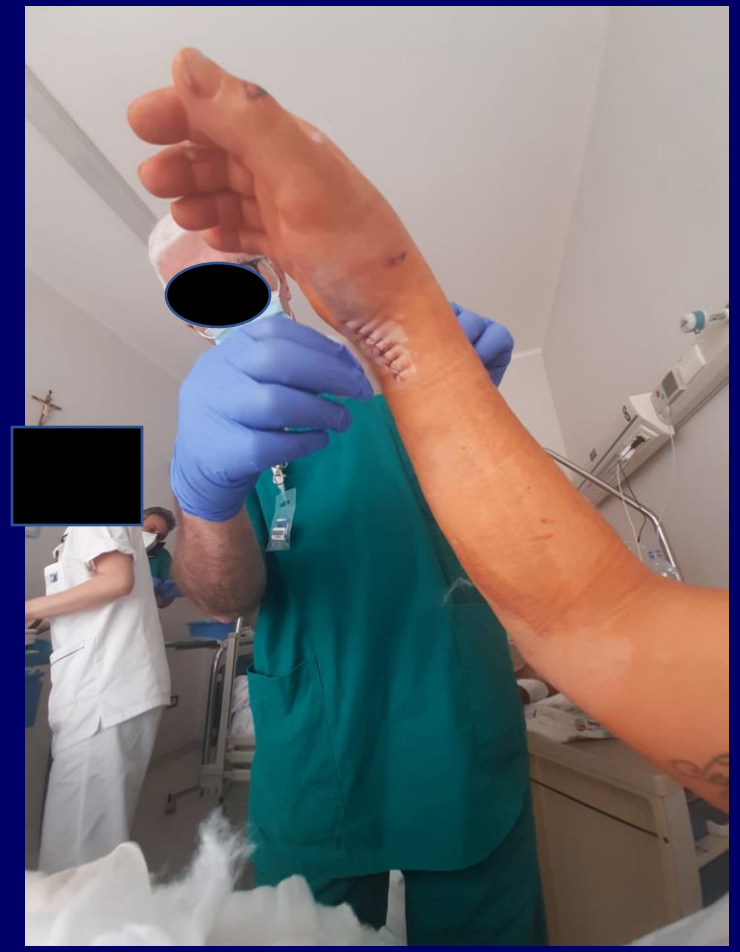
Incidente motociclistico maggio 2021

- Lussazione tran-scafo-perilunare del carpo dx
- Frattura calcagno sx

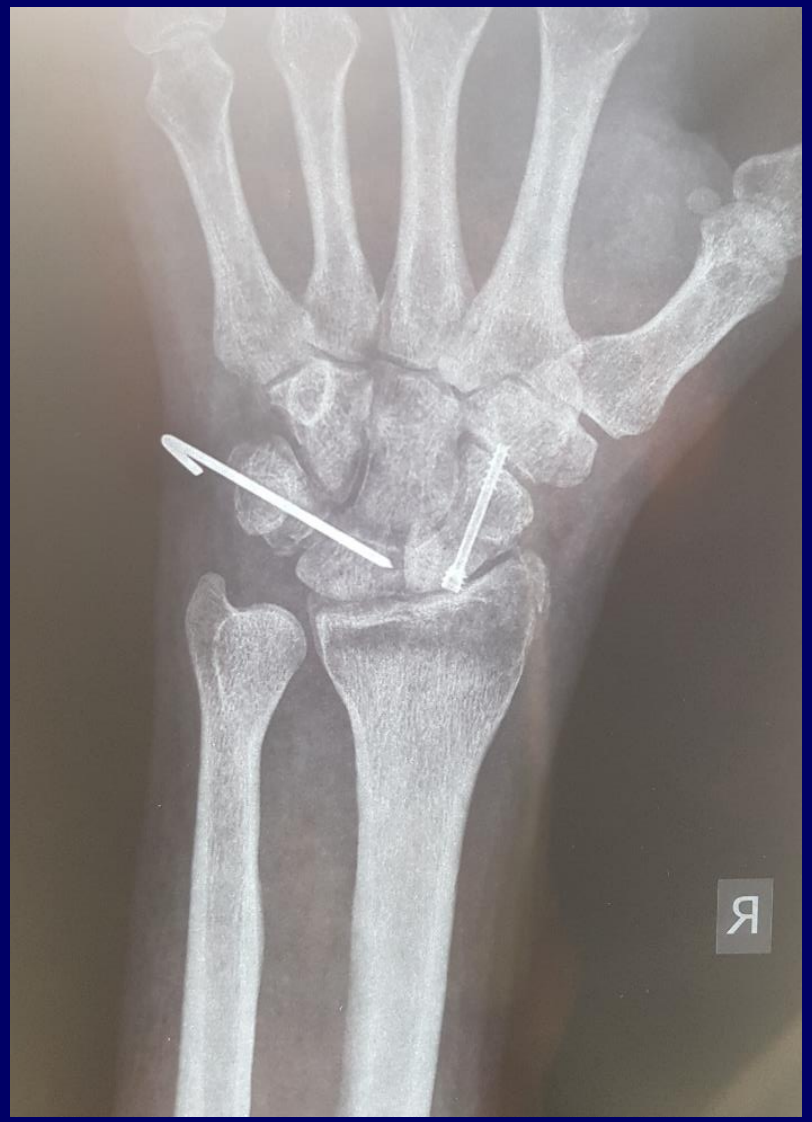
Trattamento:
- Riduzione della lussazione
- Sintesi dello scafoide
- Apparecchio gessato arto inferiore sx

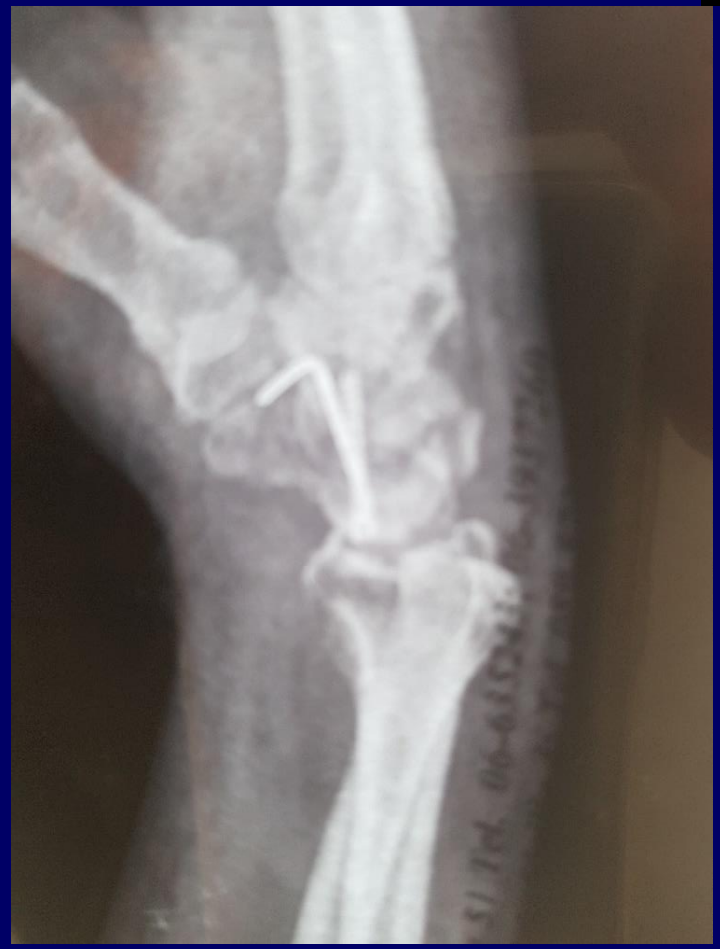
Successiva rimozione gesso arto superiore

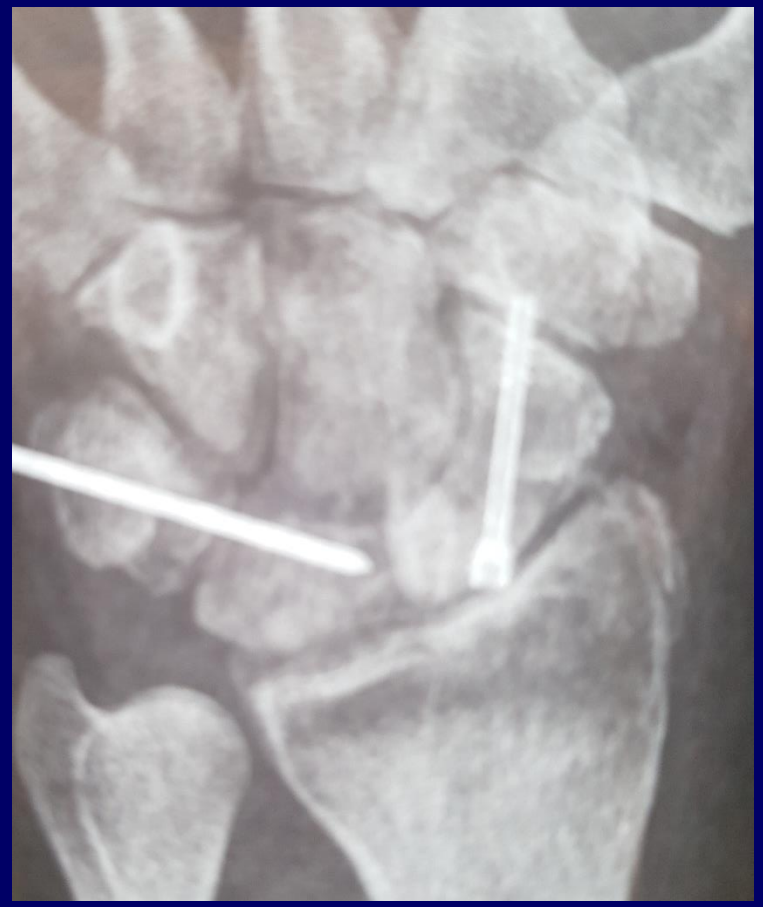
Mantiene immobilizzazione arto inferiore sx



30 giugno 2021







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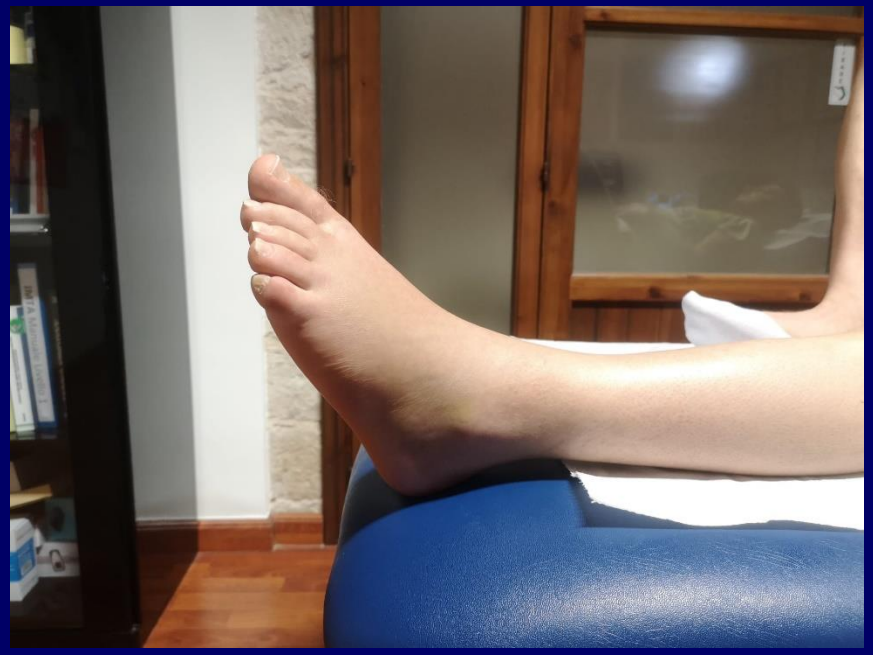

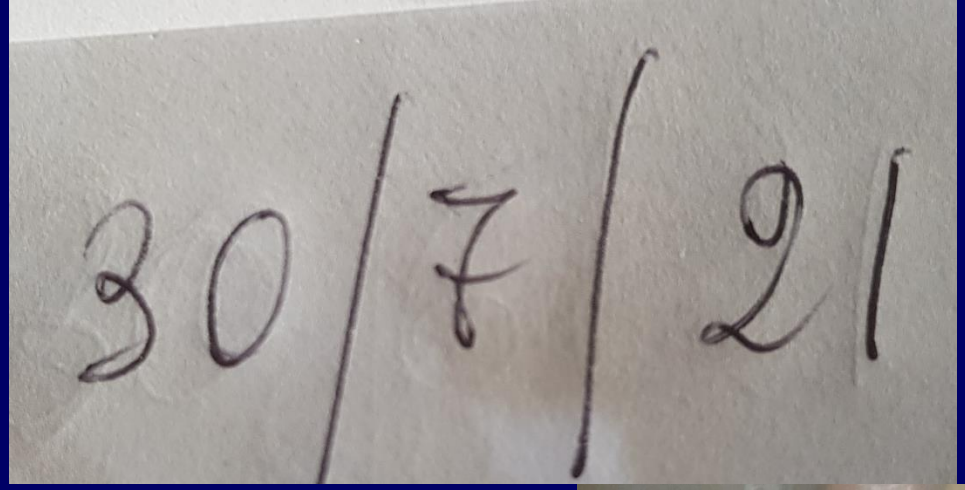
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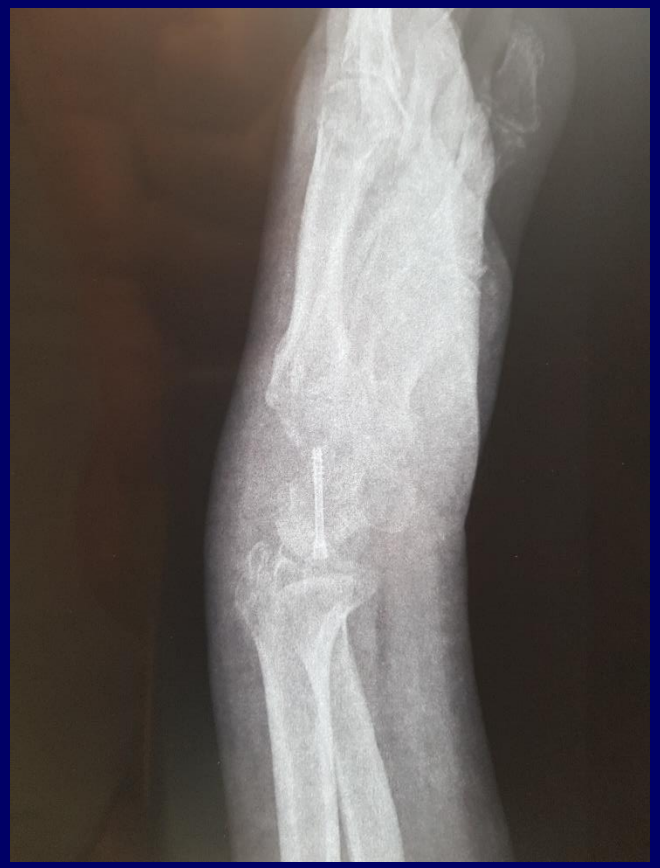
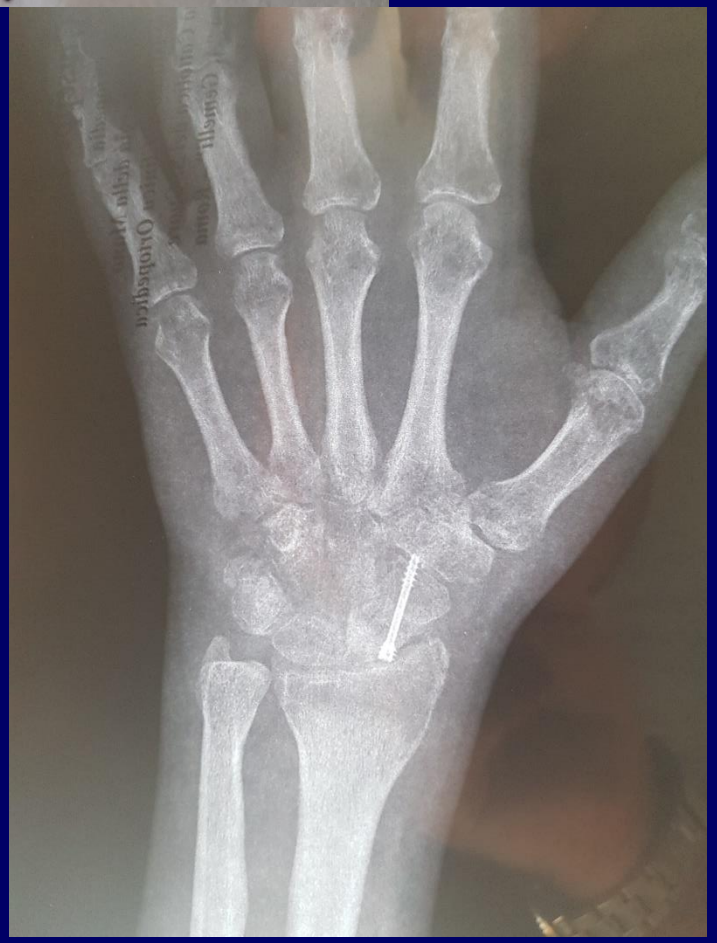
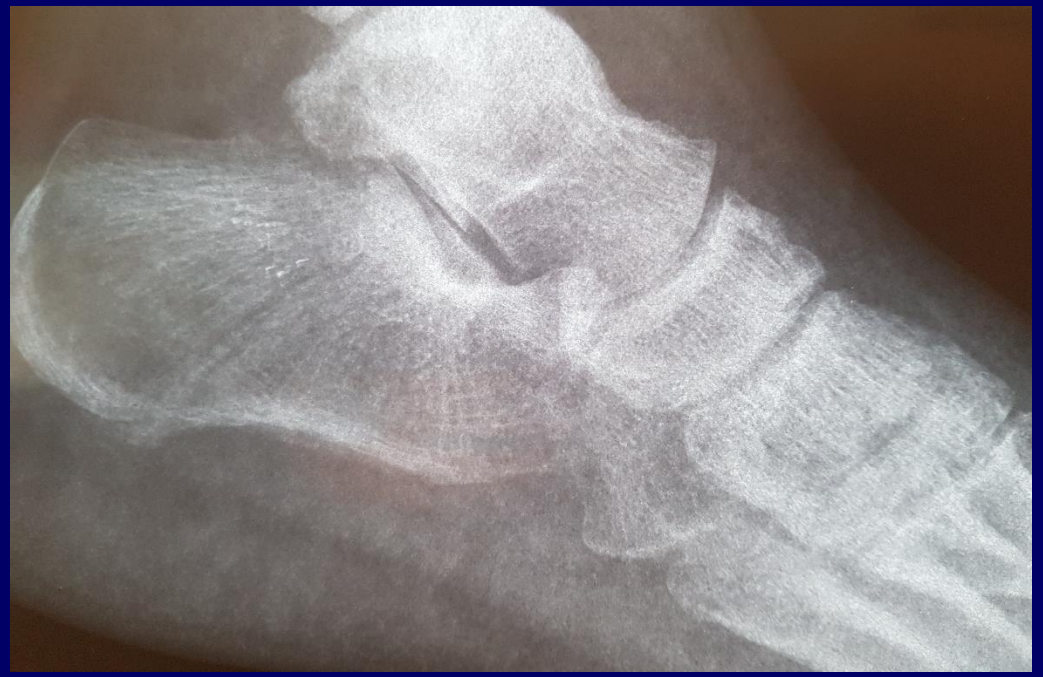
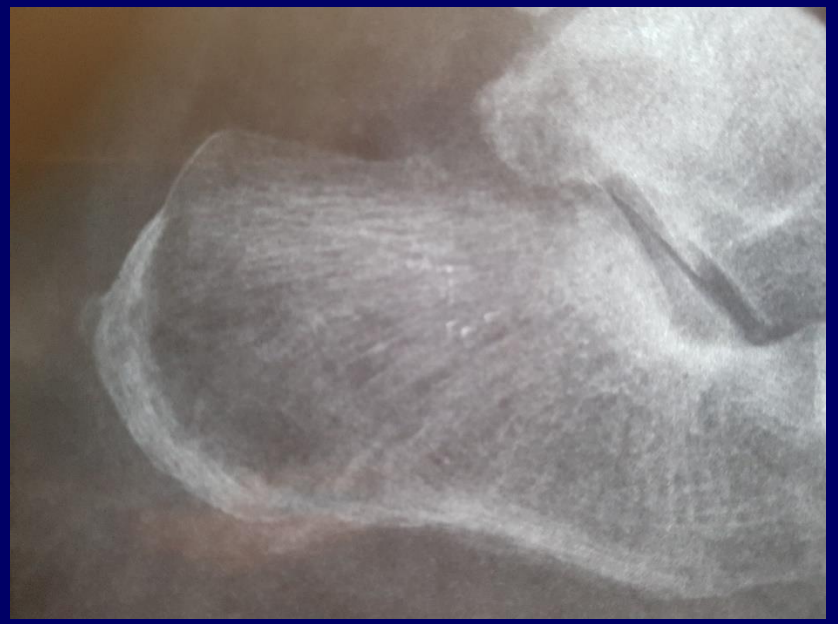
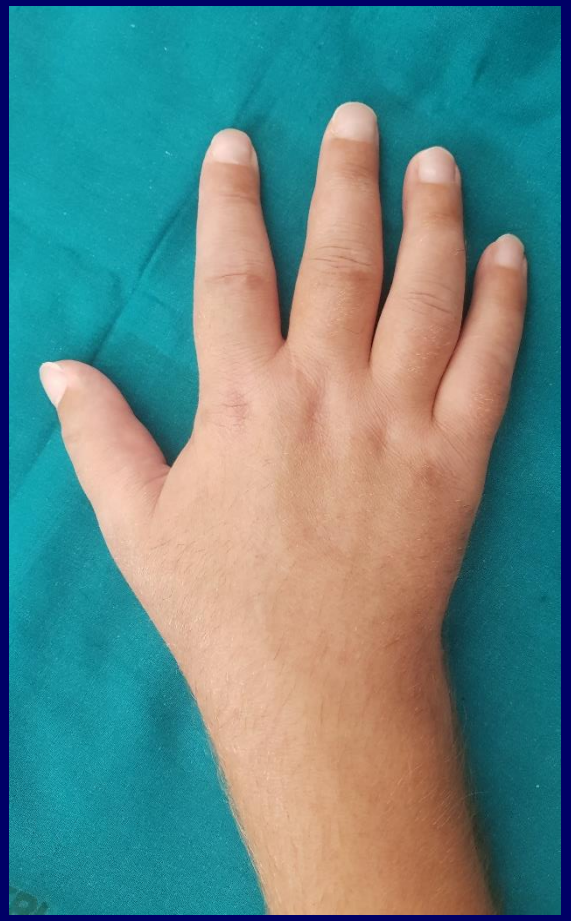
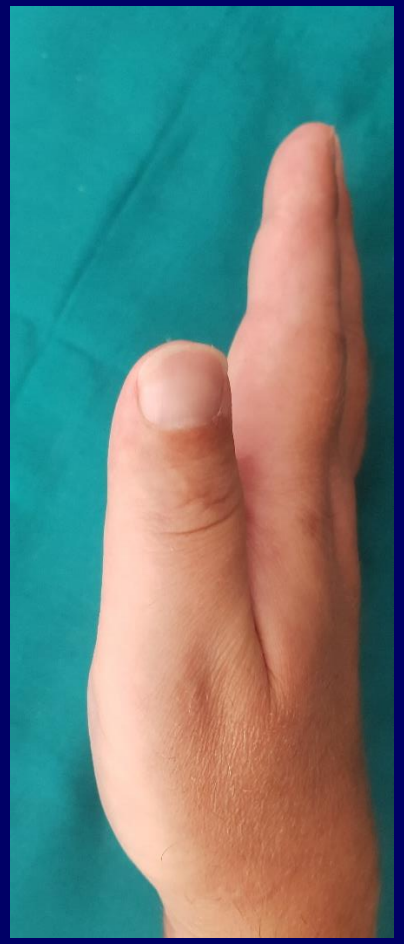
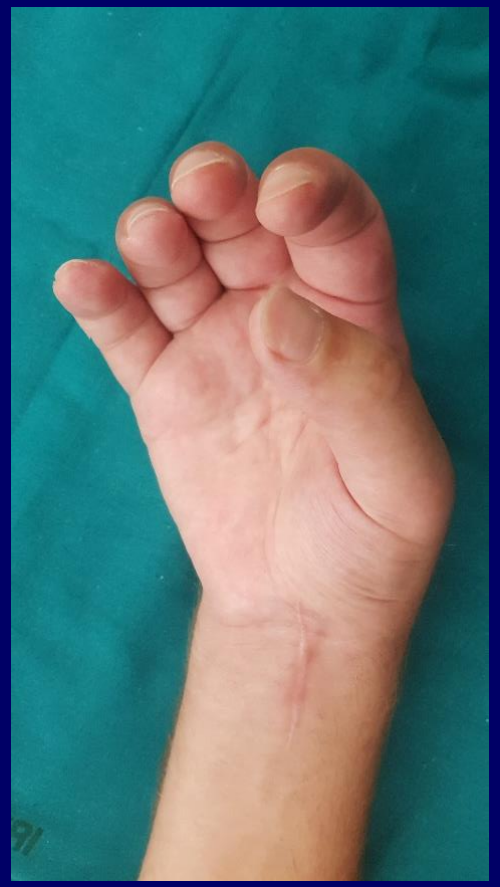
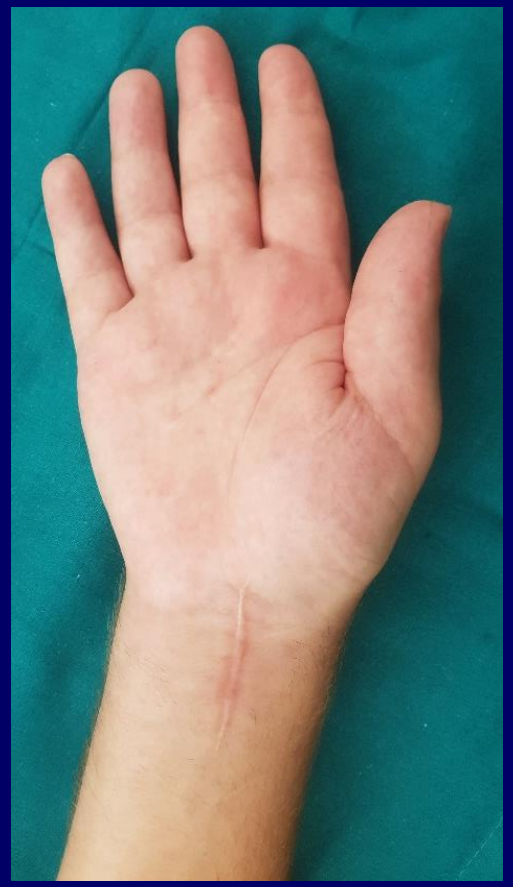








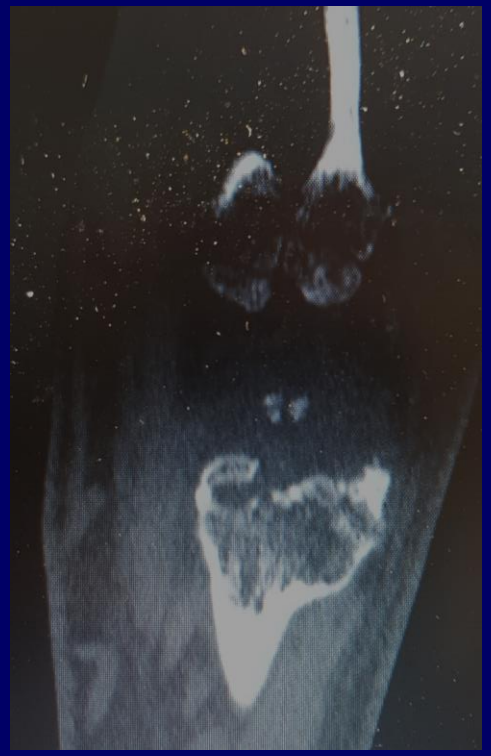
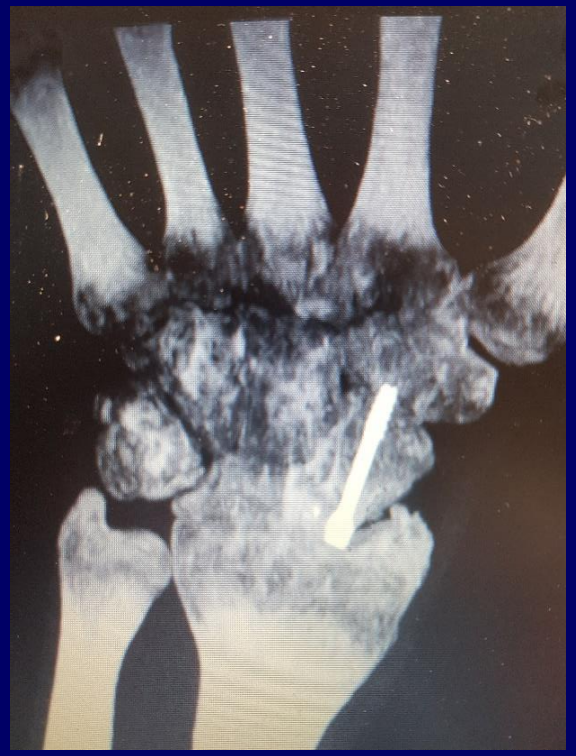
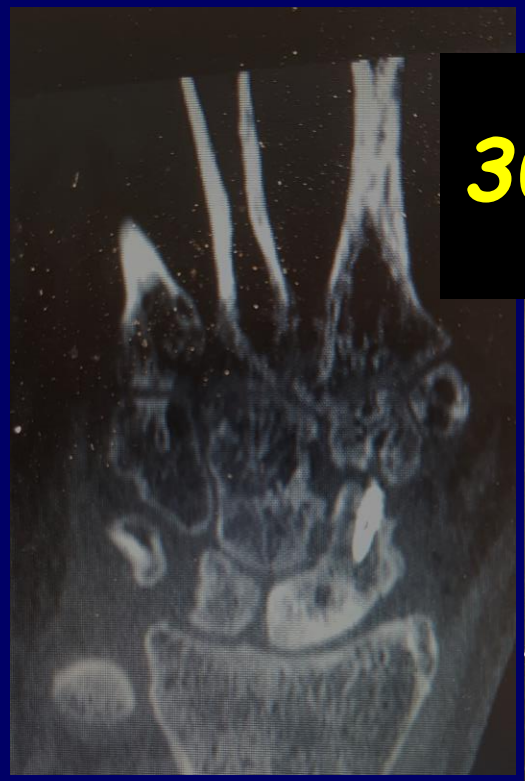
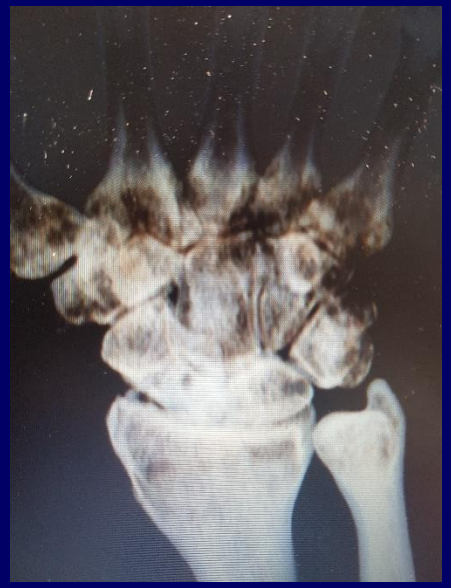
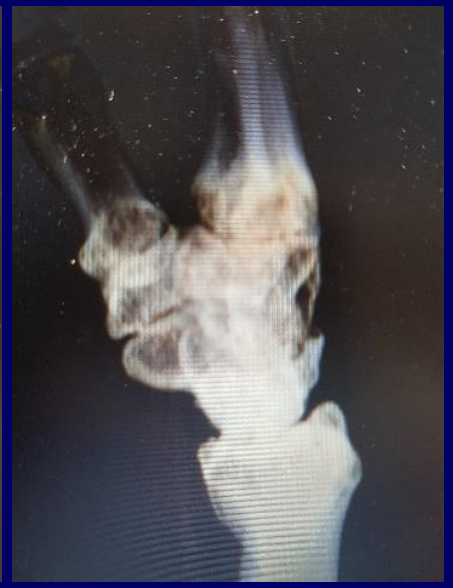
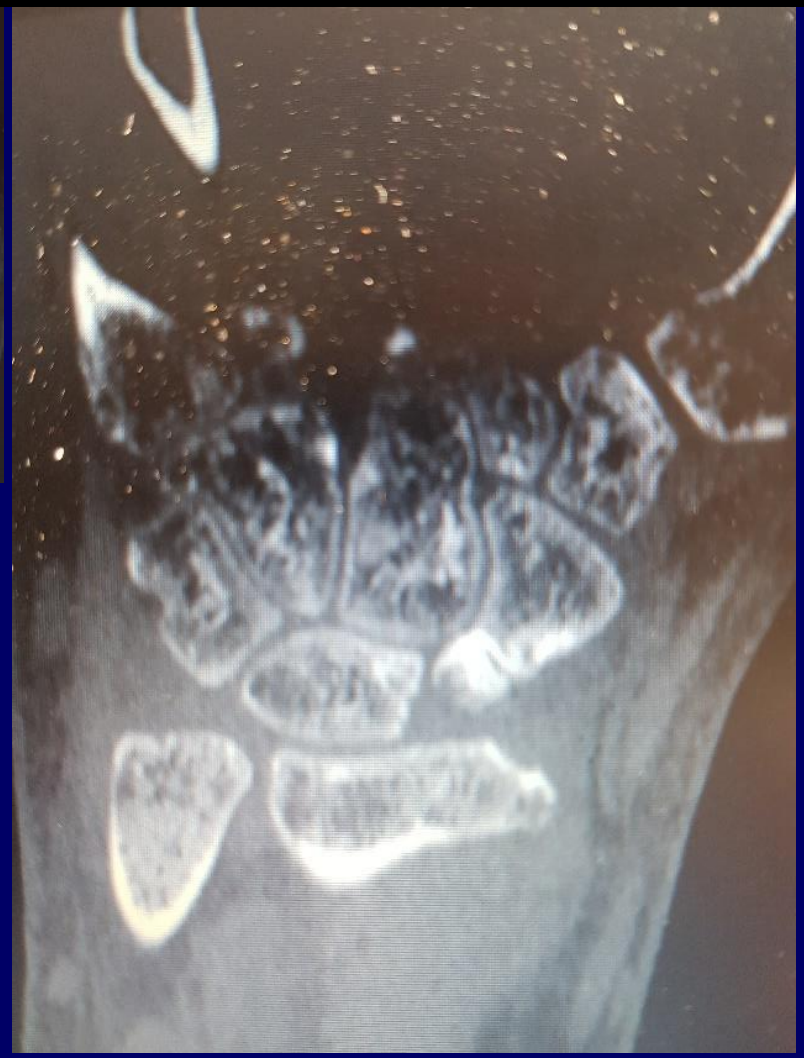





SEPTA

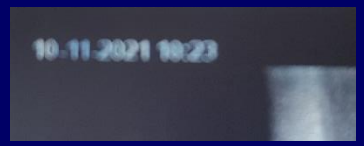
- Che esami fare?
- - tac e tac 3D?
- -rmn?
- Ecografia?
- Scintigrafia?
- ?????????

Che terapia fare?

- magnetoterapia?
- Clodronato?
- Chinesiterapia?
- Nerindronato?
- Antidolorifici?
- ??????

30 settembre 2021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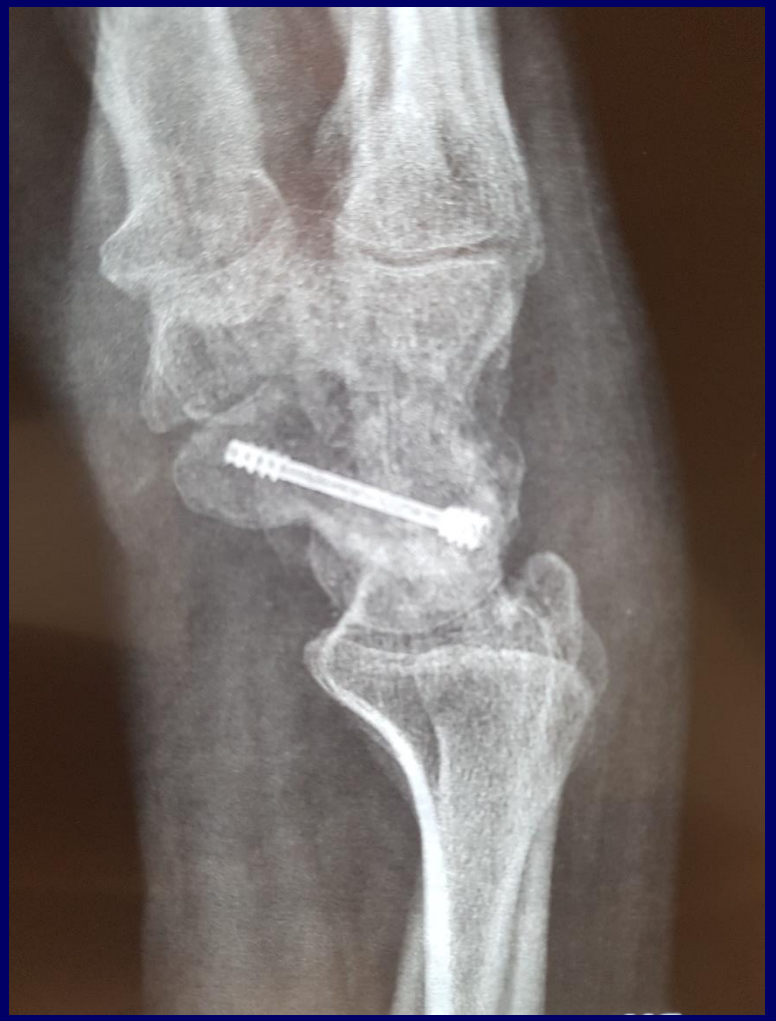
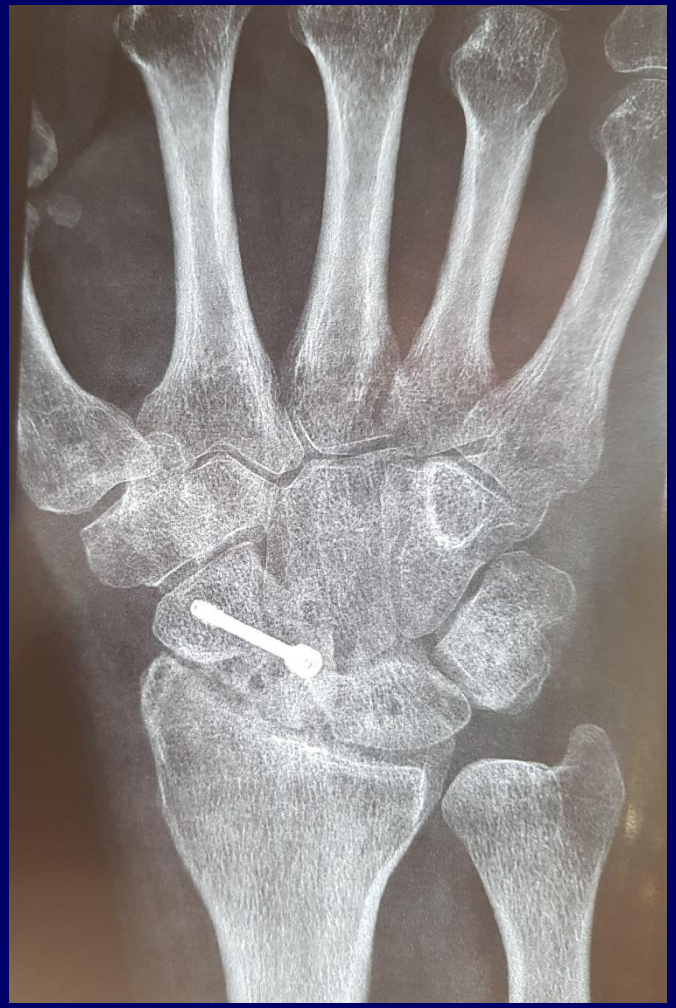
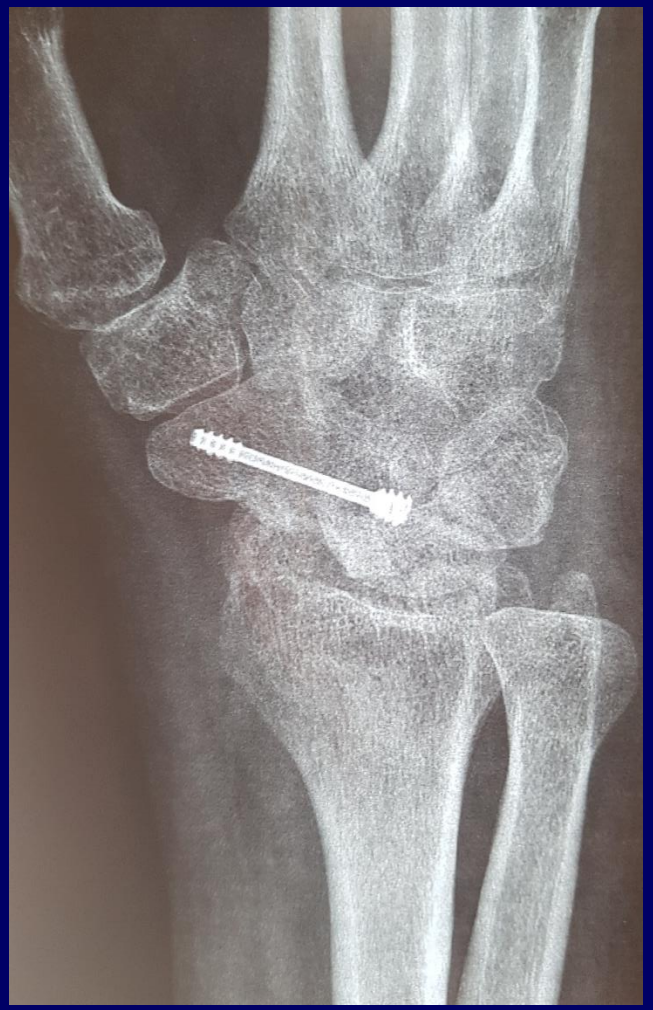
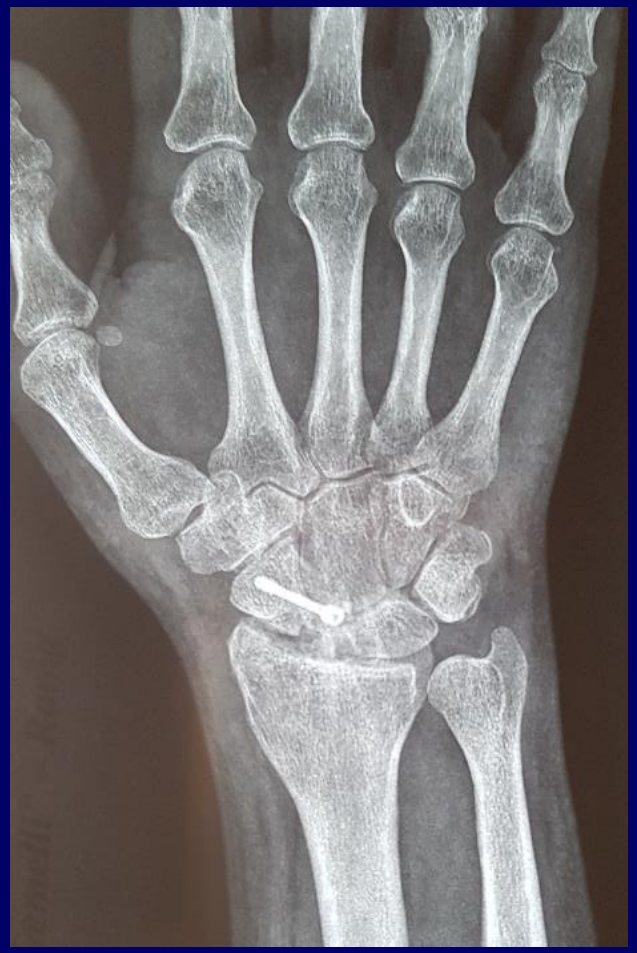


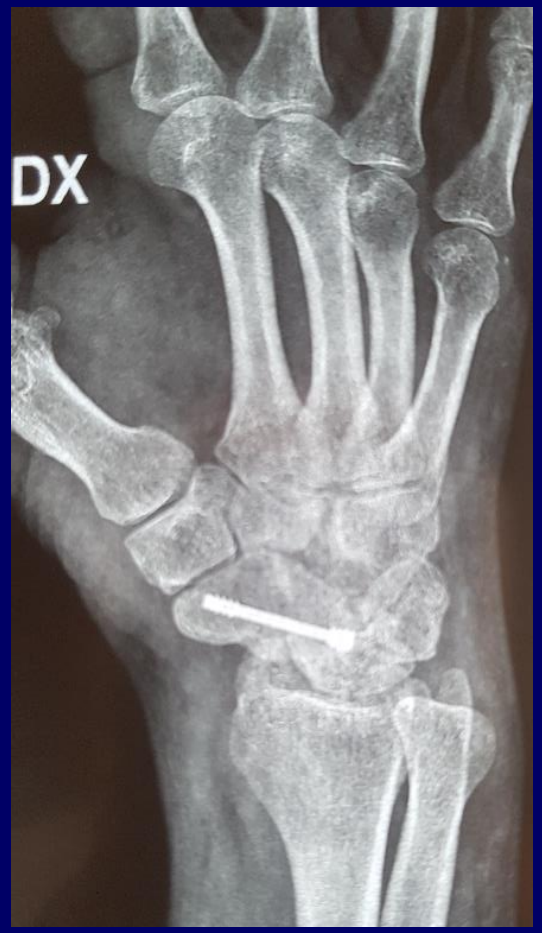


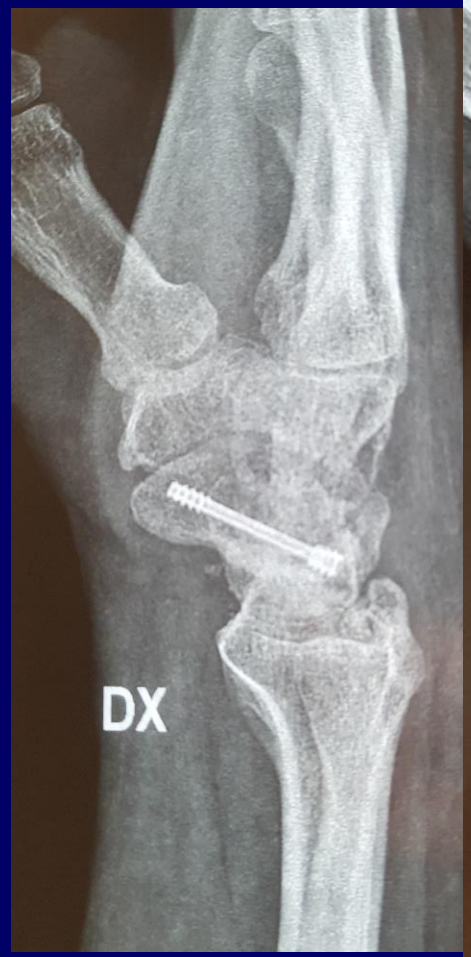


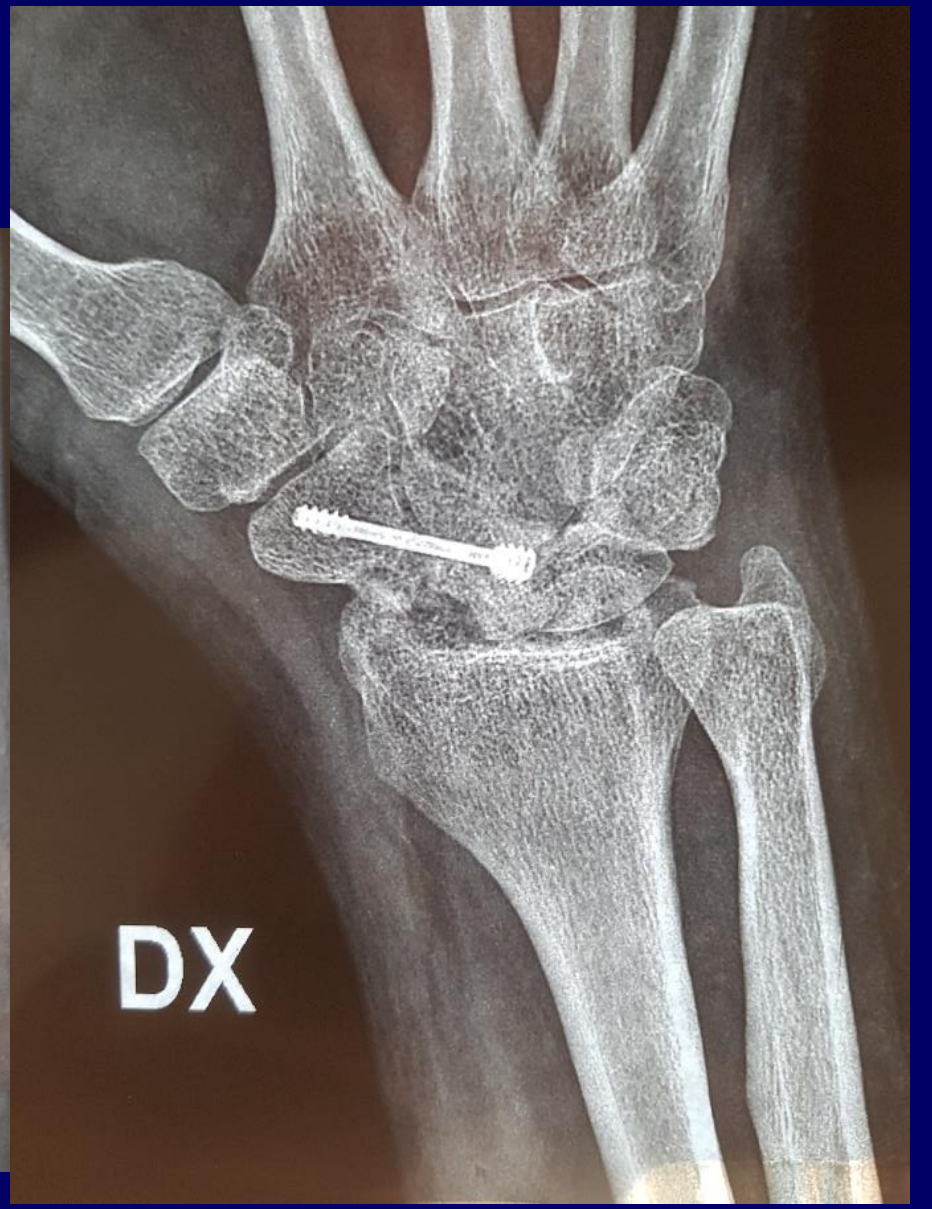
Data dell'esame **12/01/2022**

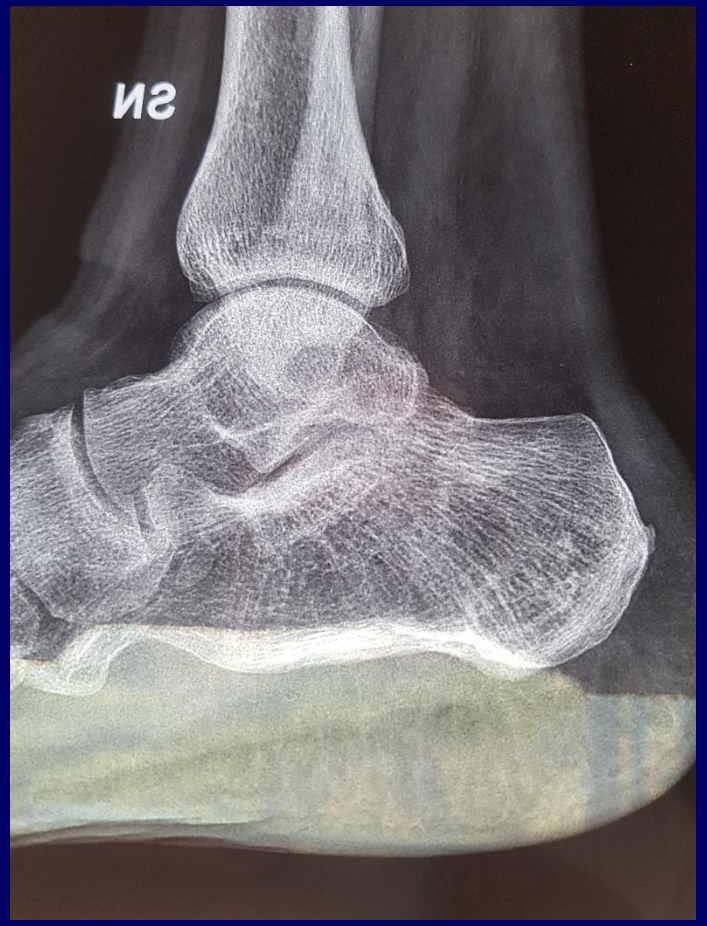
Richiesta N°: **M502888**

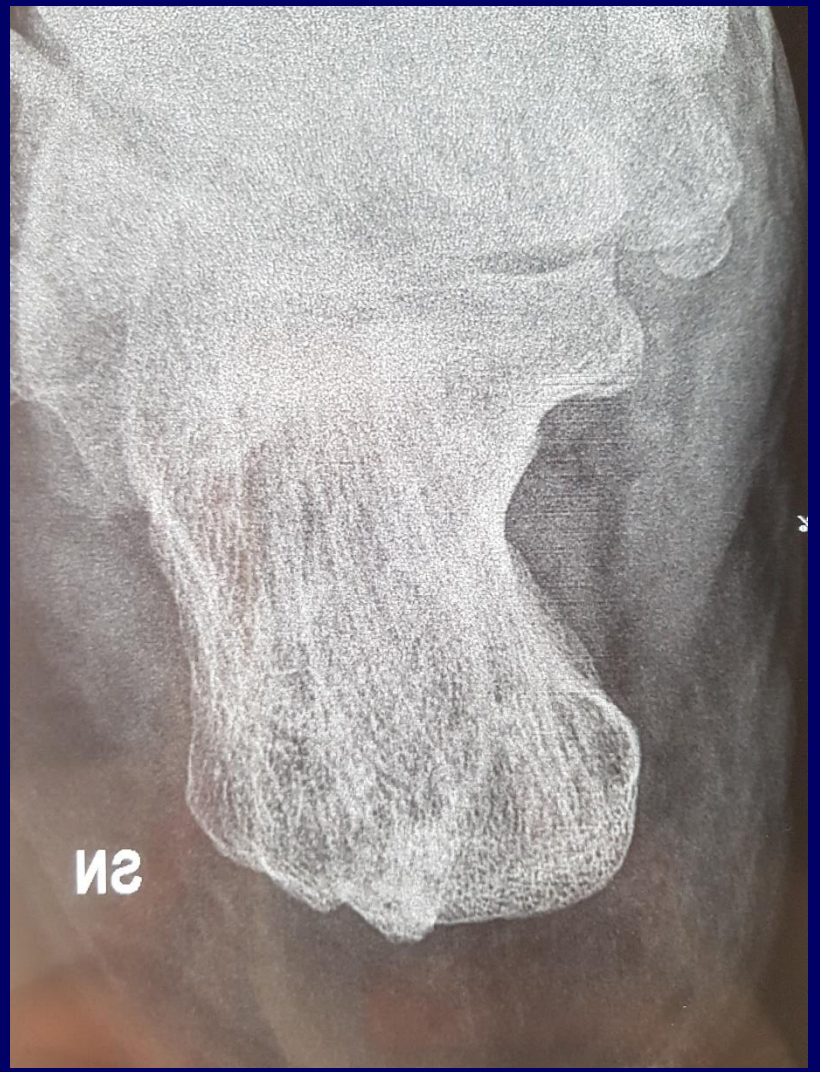












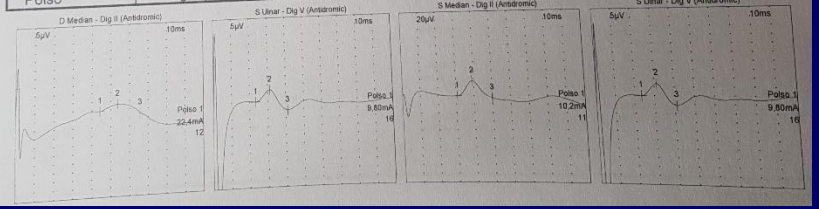
Nome e cognome: MICHELE SORICE
ID paziente: 038

Sesso: Maschio
Data di nascita: 29/08/1983

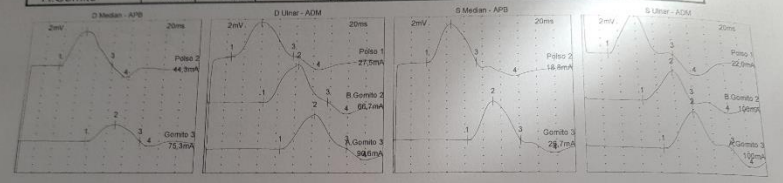
Data visita: 20/01/2022 17:50
Età: 38 Anni

Sensory Nerve Conduction Study

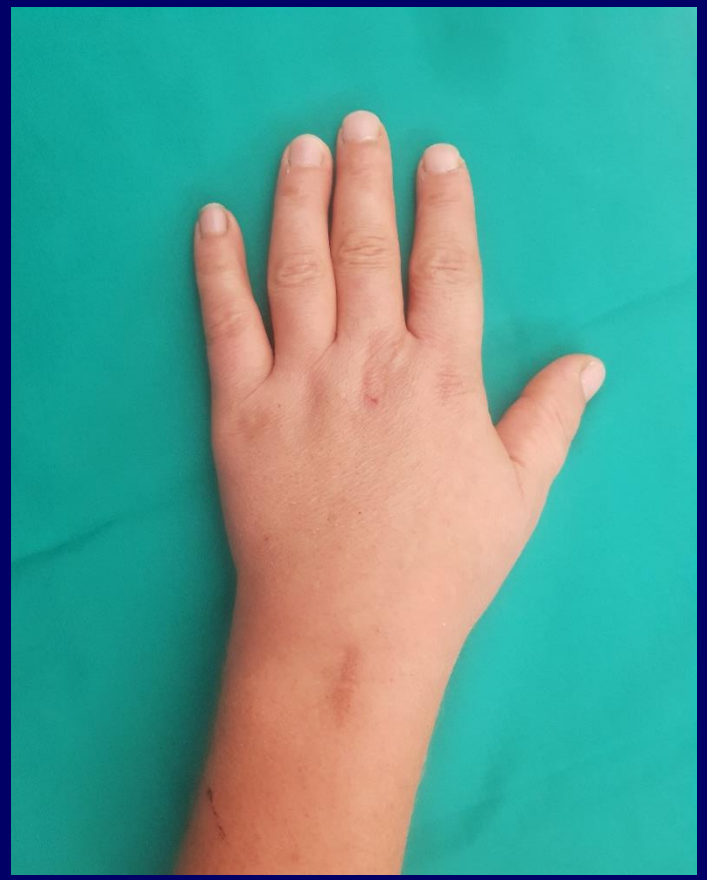
Nervo / Posizioni	Rec. Site	Onset Lat ms	Peak Lat ms	NP Amp µV	PP Amp µV	Segmenti	Distance cm	Velocity m/s	Comment
D Median - Dig II (Antidromic)									
Polso	Index	4,43	5,36	3,9	5,7	Polso - Index	13	29	
S Median - Dig II (Antidromic)									
Polso	Index	3,07	3,91	35,2	40,2	Polso - Index	14	46	
D Ulnar - Dig V (Antidromic)									
Polso	Dig V	2,19	3,23	6,4	11,8	Polso - Dig V	10	46	
S Ulnar - Dig V (Antidromic)									
Polso	Dig V	2,34	3,13	7,0	12,6	Polso - Dig V	11	47	

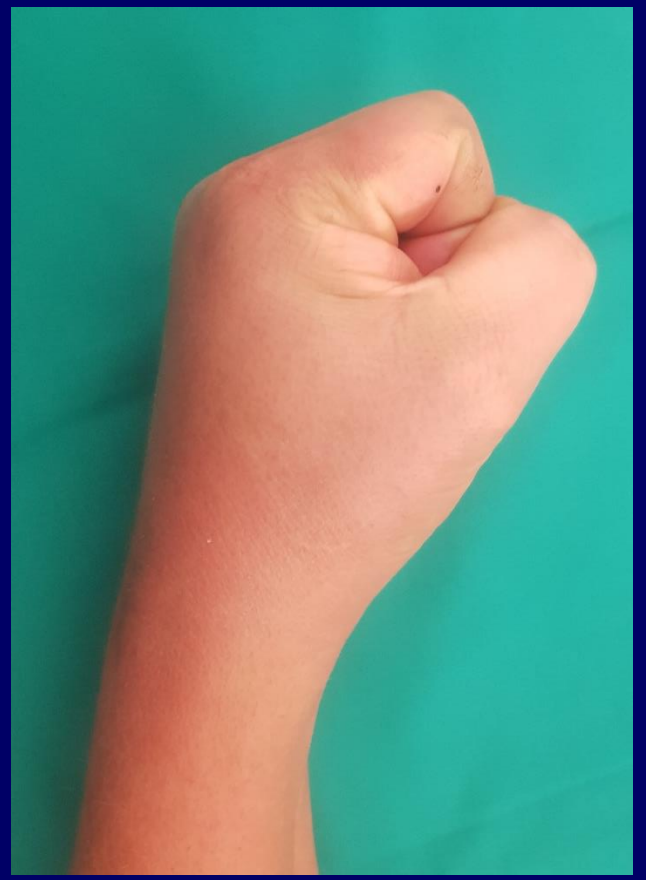
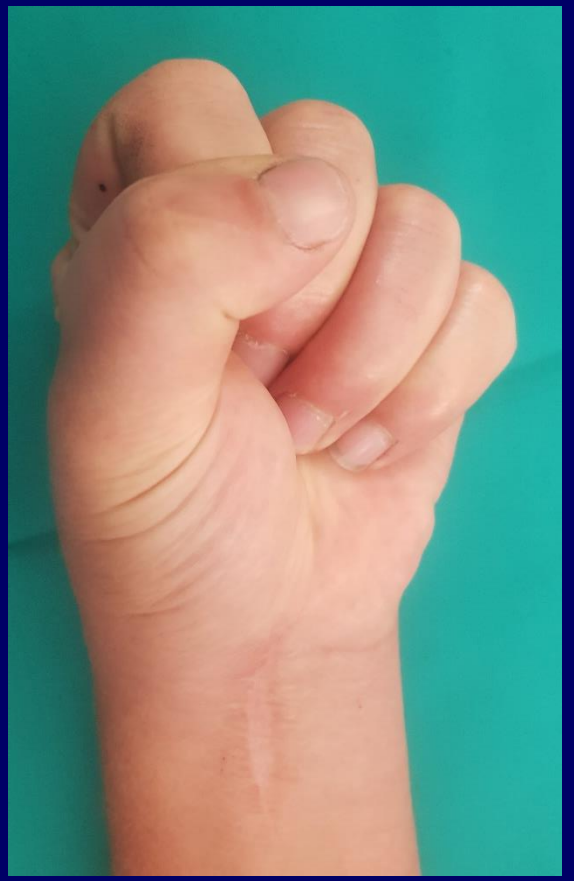
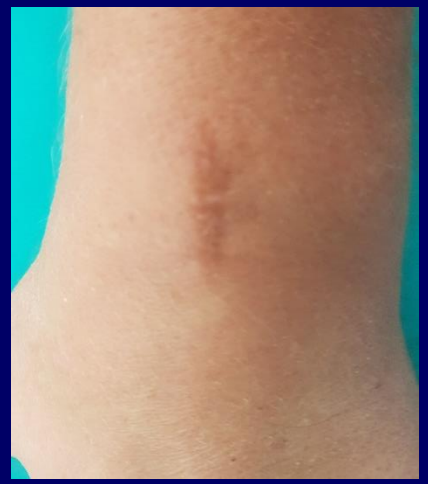


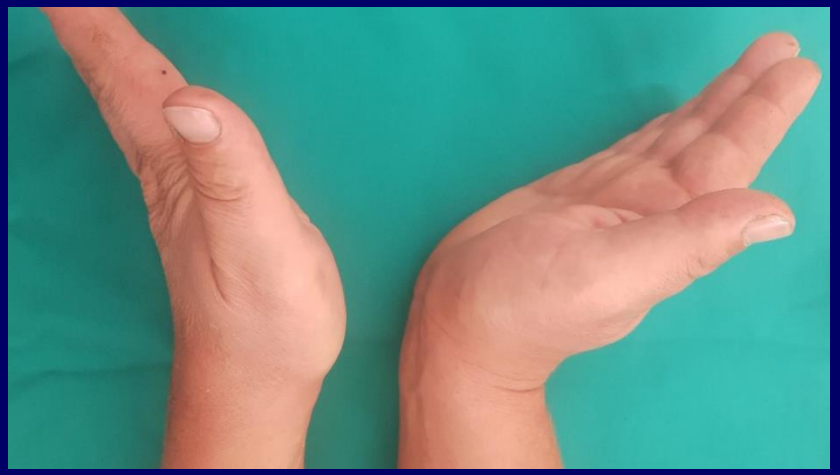
Polso	ADM	2,56	9,2	Polso - ADM	8			
B.Gomito	ADM	6,44	9,8	B.Gomito - Polso	21	3,88	54,2	
A.Gomito	ADM	8,50	8,8	A.Gomito - B.Gomito	10	2,06	48,5	
S Ulnar - ADM								
Polso	ADM	2,79	10,6	Polso - ADM	8			
B.Gomito	ADM	6,40	7,7	B.Gomito - Polso	19	3,60	52,7	
A.Gomito	ADM	8,42	9,5	A.Gomito - B.Gomito	10	2,02	49,5	

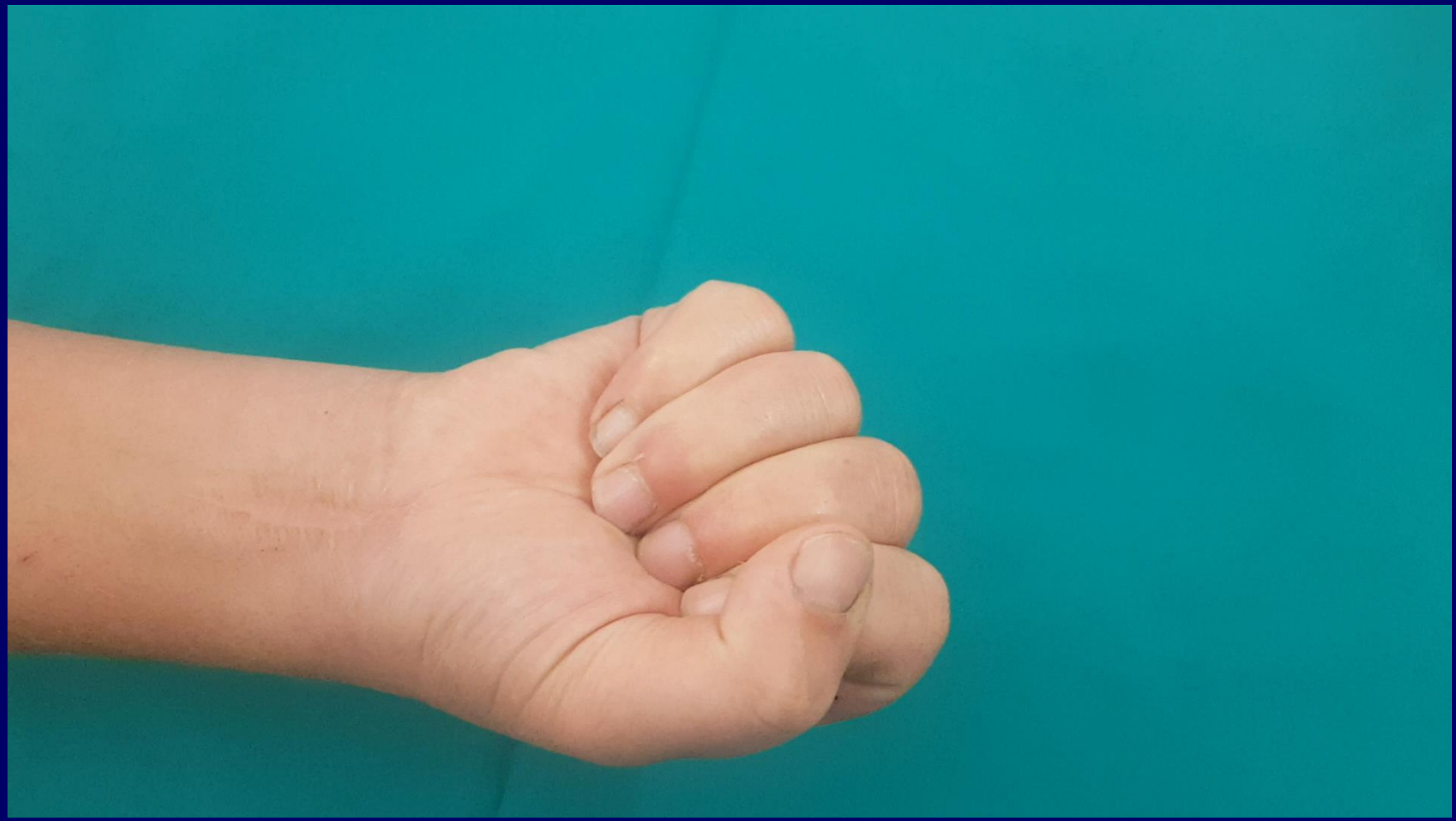


Descrizione:
Esaminate le VDC dei Nervi Mediano e Ulnare bilateralmente.
Nella norma le VCM e l'ampiezza dei PEM del Nervo Mediano bilateralmente; ridotta la VCS e il PES dello stesso nervo a destra, nella norma a sinistra.
Nella norma le VCM, le VCS e l'ampiezza dei potenziali del Nervo Ulnare bilateralmente.
Conclusioni:
VDC del Nervo Mediano alterate a destra compatibili con Sindrome del Tunnel Carpale di grado lieve.
Si consiglia visita fisiatrica ed esame di controllo tra 6 mesi.

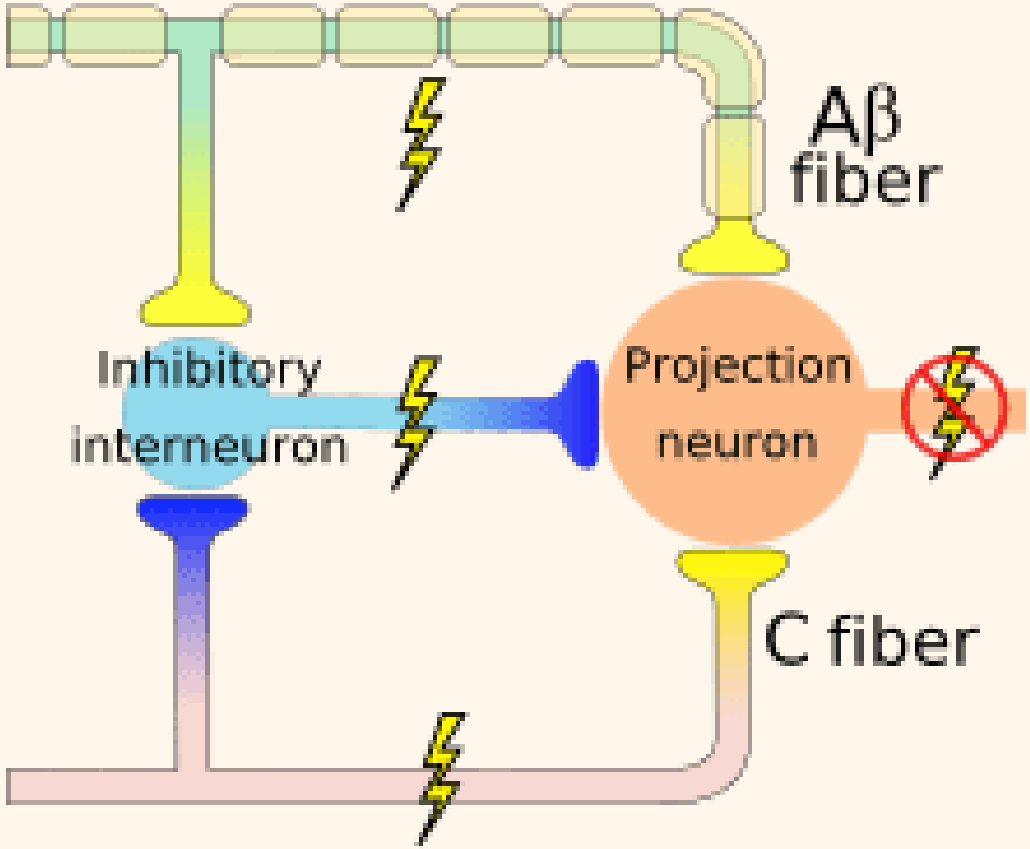




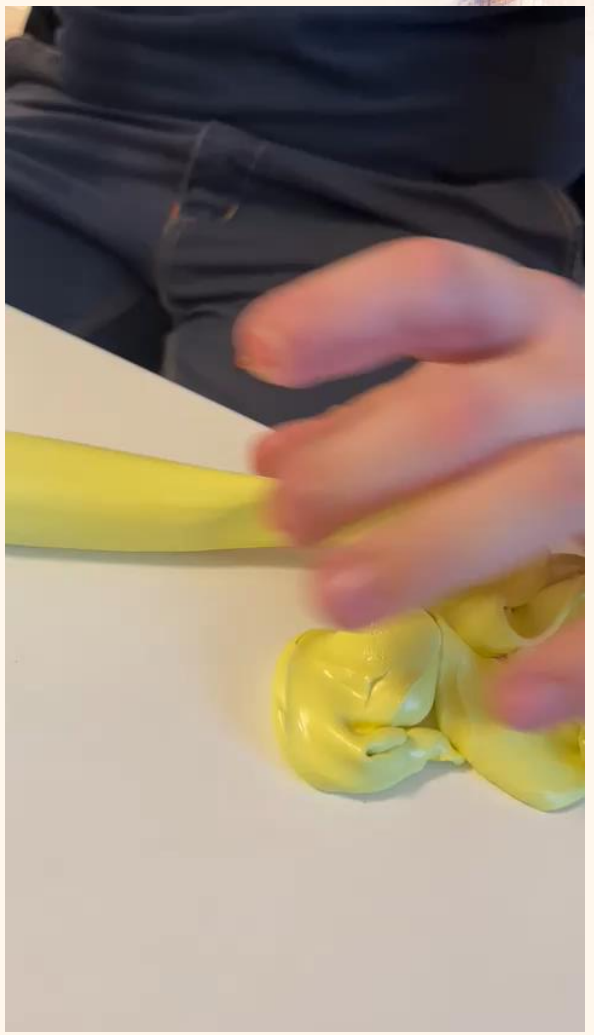


Why hand therapy ?



SOCIETÀ ITALIANA
G.U.I.D.A.
PER LA GESTIONE UNIFICATA E INTERDISCIPLINARE DEL DOLORE MUSCOLO-SCHELETRICO E DELL'ALGODISTROFIA

hand therapy



Conclusion

- only nerindronatenate were found to give uniformly positive effects, statistically significantly better than placebo
- Improvement has been reported with topical DMSO, systemic steroids, spinal cord stimulation and graded motor imagery/mirror therapy programmes.
- Several treatments with no evidence are used in clinical practice
- Diagnostic and therapeuthic problem

Contrary to dominant thinking

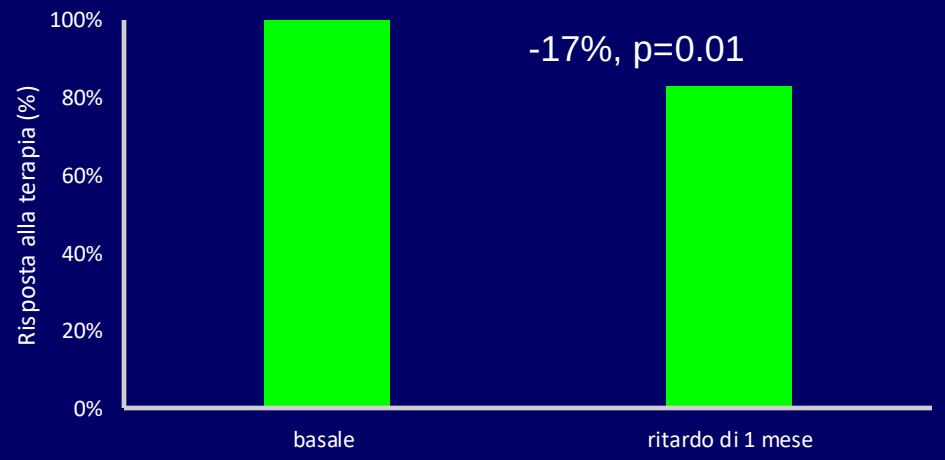
- Paco Piñal (2013)
- I have a dream … reflex sympathetic dystrophy (RSD or Complex Regional Pain Syndrome - CRPS I) does not exist (JHS Eur Vol)
- “mysterious painful process”
- We should look for real causes
  - CRPS after cast immobilization → Unstable fractures
  - Subclinical nerve entrapment (typical and atypical)
  - Disvascular states (Cold-Tobacco-Crush)
  - Psychiatric (e.g. conversion disorders)

My conclusion

- Diagnosis and therapy unclear
- Lack of evidence (especially and specifically for hand diseases)
- Nerinronate and physiotherapy +++
- Organic causes should be ruled out

PRECOCITÀ DELLA TERAPIA

- A un mese di ritardo nella somministrazione della terapia corrisponde una riduzione della responsività del paziente del 17%



Varenna M et al. Pain Medicine 2017;18: 1131–1138

necessità di anticipare la diagnosi

- Una diagnosi ritardata sembra agire come un fattore prognostico negativo, così come un ritardo del trattamento e una maggiore durata del dolore

- Nella gestione di algodistrofia **più breve è la durata della malattia, migliore è l'esito del trattamento**

Varenna M et al. Pain Medicine 2017;18: 1131–1138
Varenna M et al. J Clin Rheumatol. 2021;27(8):e491-e495

5 sagge proposte di management

- - quando possibile intervenire sulla causa
- Utilizzo dei farmaci deve essere corrispondente alla patologia sia di base che sull'algodistrofia
- Non fossilizzarsi sulla propria disciplina
- Lavorare sempre in sintonia con il paziente
- ?????? **– Necessità di anticipare diagnosi e terapia**

- **PREVENZIONE**

GRAZIE