



THE 9th ANNUAL WORLD CONGRESS OF ORTHOPAEDICS



Date

October 15-17, 2025



Venue

Nice, France

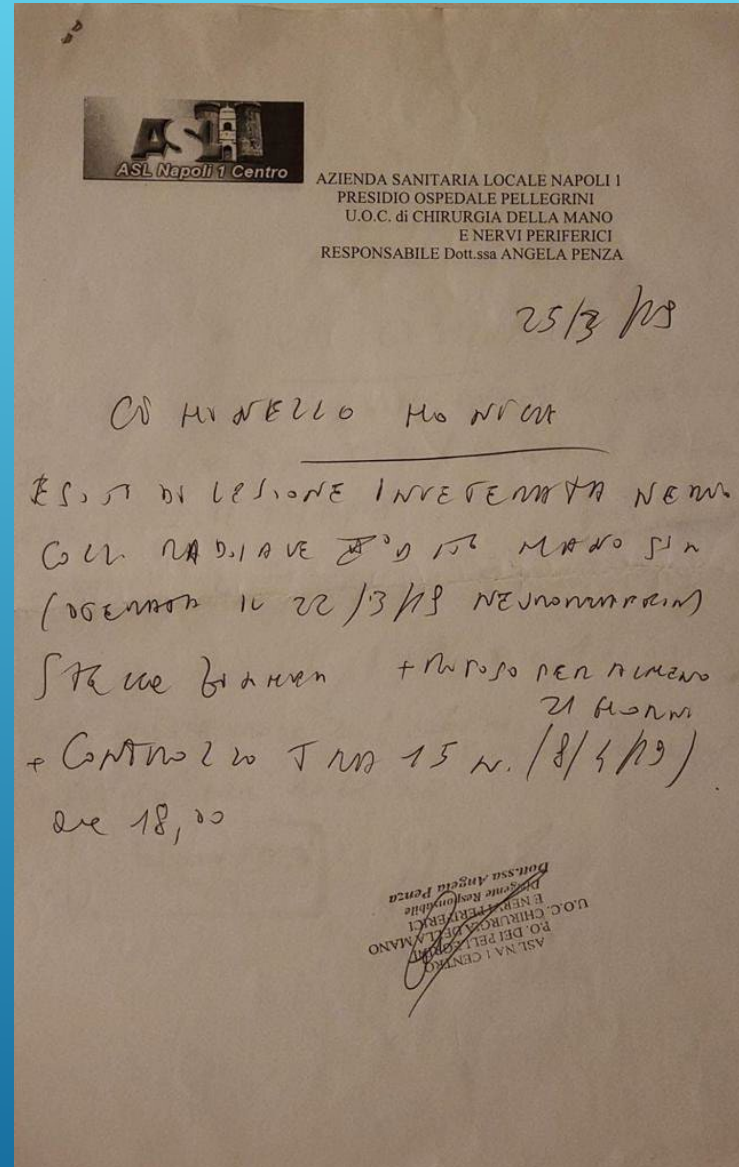


**THE CARUSO-CIMINELLO PROSTHESIS AS A SURGICAL
ALTERNATIVE FOR THUMB AMPUTATION: SIX-YEAR FOLLOW-UP,
AESTHETICS AND FUNCTIONAL IMPROVEMENTS**

Dott. Leopoldo Caruso



THE LUCKY MEETING WITH ENGINEER MONICA CIMINELLO





PROSTHESIS CHARACTERISTICS

**Concave and perforated base
To accommodate the metacarpal head and growth
factors**

Radial holes for tendon transposition

Microstructures surface to promote osseointegration.



PROTESI DI POLLICE ANCORATA AL METACARPO DA CARICO COMPRESSIVO ANGOLARE (PPP-CC)

THUMB PROSTHESIS USING A METACARPAL-ANCHORING WITH ANGULAR COMPRESSIVE LOAD (PPP-CC)

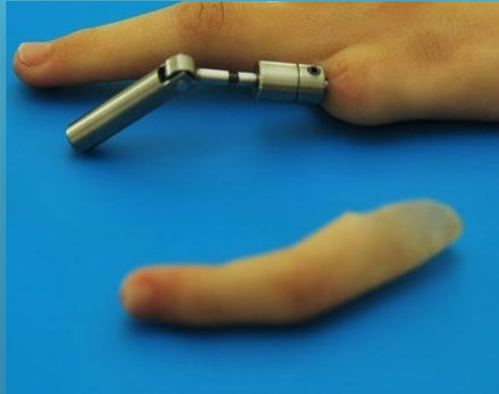
Autori: L.Caruso, M.Ciminello, S.Ameduri

Implatology techniques for orthopedic prosthesis

- Dental industry: Branemark technique (1969)
- Limited experience with osseointegration prosthesis in hand surgery



DIANCEHT
(Messico)



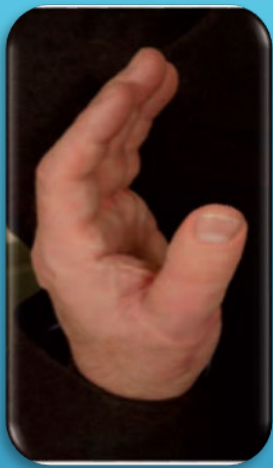
OPRA™
(Svezia)



ARMDYNAMICS
(California)



	DIANCEHT	OPRA™	ARMDYNAMICS
MINIMUM COST OF SILICONE PROSTHESIS	>700 \$	>500 £	-
MINIMUM COST OF TITANIUM IMPLANT	>2000\$	>>2000£	>>5000\$
MINIMUM DELIVERY TIMES	90 DAYS	90 DAYS	90 DAYS



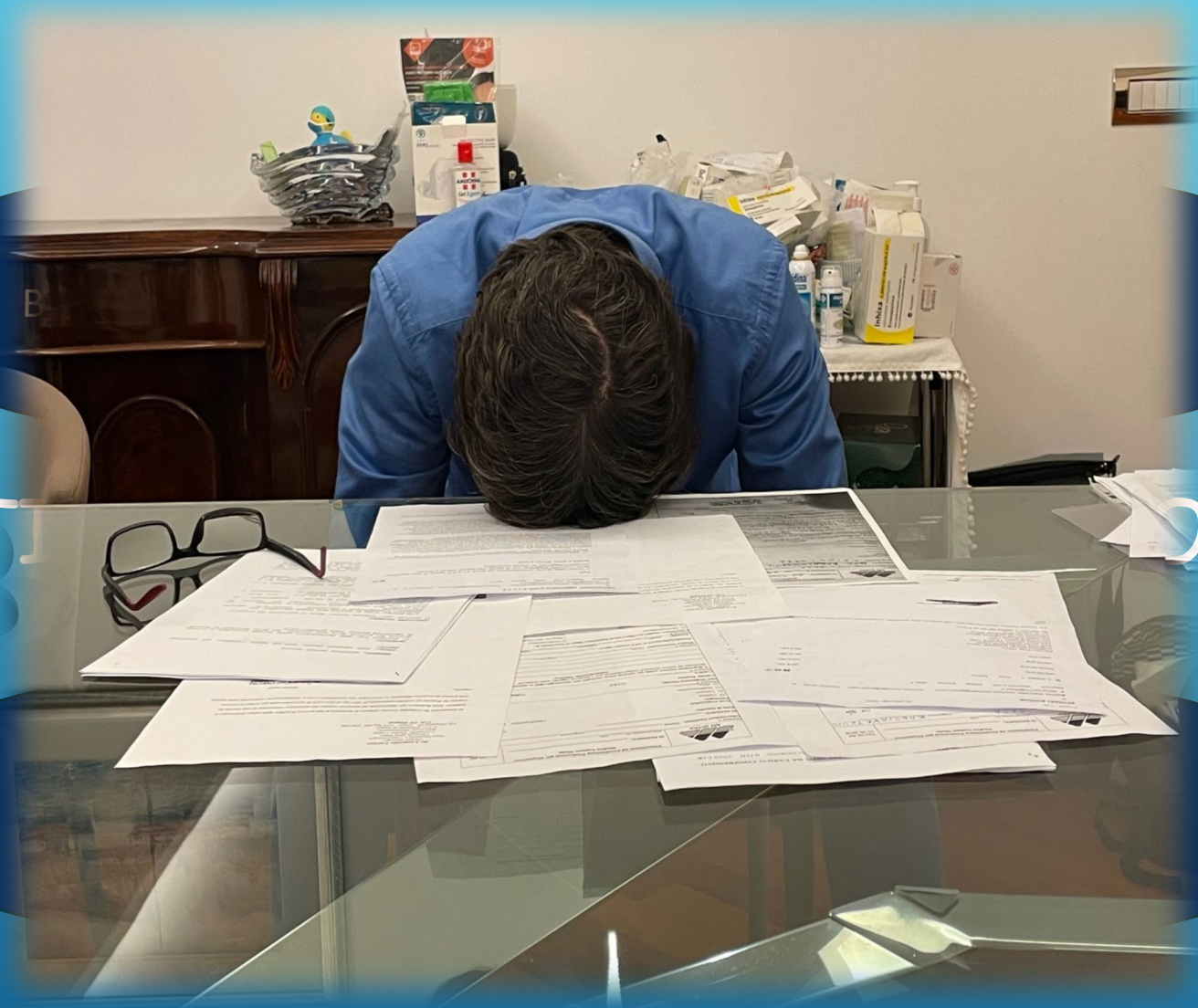
LIMITS

- ✓ MODULARITY OF THE PROSTHESIS
- ✓ PERCUTANEOUS SKIN IRRITATION AND SUPERFICIAL INFECTION
- ✓ PERIODIC MAINTENANCE
- ✓ LOSS OF THE PROSTHESIS
- ✓ SILICONE WEAR OVER TIME
- ✓ PROSTHETIC INSTABILITY DUE TO CONTINUOUS INSTALLATION AND UNINSTALLATION



THE T

PROCESS...



OUR SOLUTION (NOT INTENDED AS AN AESTHETIC PROSTHESIS)

LEOPOLDO CARUSO, MD
MONICA CIMINELLO, ENG



PATENT ON AUGUST
'22

CARUSO – CIMINELLO PROSTHESIS PROJECT

1. THREE ANCHOR PLATES AROUND THE METACARPAL.
2. ADDITIVE MANUFACTURING
3. FIXING SCREWS 2.0/2.3 MM.
4. RADIAL HOLES FOR TENDON TRANSPOSITION.
5. HOLES FOR GROWTH FACTORS
6. COMPRESSION SCREWS FOR SYMMETRICAL STABILIZATION



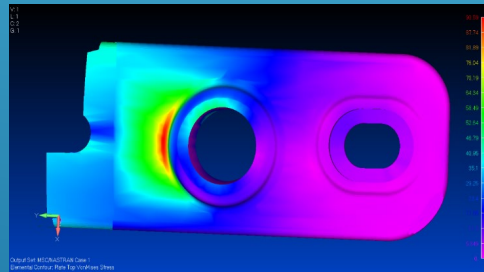
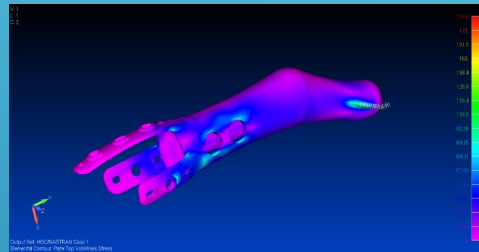
MATERIAL:

- ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS) F136-13 STANDARDS
- **TITANIUM ALLOY Ti-6Al-4V ELI GRADE 23**
- HIGH DEGREE OF BIOCOMPATIBILITY
- LIGHTWEIGHT
- CORROSION RESISTANT
- HIGHLY RESISTENT TO FRACTURES

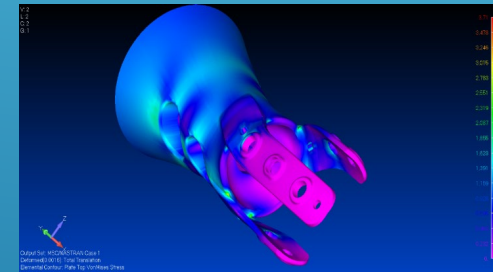
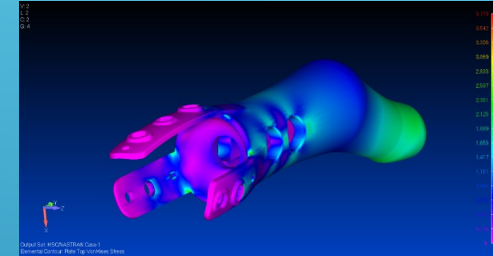


METODOLOGY

BENDING STRESS (100N)



TORSION STRESS (30NMM)



THE STATIC ANALYSIS (VON MISES STRESS) SHOWS THAT THE PLATES OF THE PROSTHESIS RESIST THE FLEXION-TORSIONAL STRESSES IMPOSED, WITH VALUES BELOW THE YIELD POINT OF THE MATERIAL.

TRAUMATIC LOSS OF THUMB

INDICATION FOR REPLANTATION:
THUMB AT ANY LEVEL AND FOR ANY
KIND OF LESION

HOW TO DEAL WITH SECONDARY THUMB
RECONSTRUCTION WHEN MICROSURGERY IS
CONTRINDICATED?



INDICATIONS

PROSTHESIS CARUSO-CIMINELLO

- BIOETHICS
- FORENSIC MEDICINE (INFORMED CONSENT)
- GAIT
- MANUAL WORKER
- PARTIAL THUMB AMPUTATION
- PSYCHOLOGICAL ACCEPTANCE
- REFUSAL OF OTHER MICROSURGICAL RECONSTRUCTION (MORRISON, SECOND TOE-TO-THUMB...)

...EXTENSION OF INDICATION

HALF I METACARPAL BONE



CASE N.1

R.S. 49 YO, NEW YEAR'S EVE 2020

FIREWORK WITH SEVERE BILATERAL HAND INJURY AFFECTING ALL THE FINGERS
PRECARIOUS SOCIAL AND FINANCIAL SITUATION (POOR LIVING CONDITION,
LARGE FAMILY, UNEMPLOYED)
SURGICAL MANAGEMENT DURING COVID PANDEMIC (MARCH '20)



SURGICAL PROCEDURE: MARCH, 10th 2020
COVID 19 LOCKDOWN IN ITALY



Ospedale dei Pellegrini, Napoli, Italy

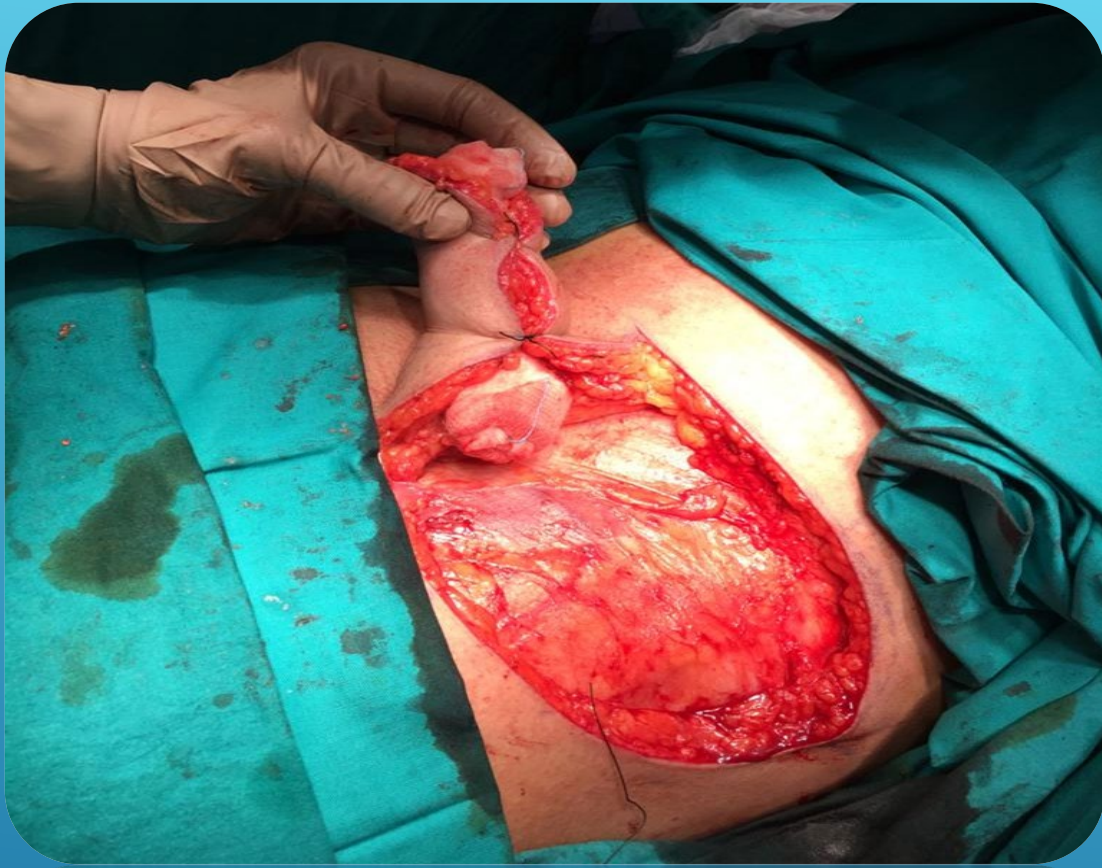


**PREPARATION FOR THE PROSTHESIS IMPLANT
DETACHMENT AND REATTACHMENT OF THE RESIDUAL TENDONS**



STABILIZATION OF THE PROSTHESIS WITH 2 MM COMPRESSION SCREWS

FLUOROSCOPY



Flap dissection
The flap is fixed to the affected area with the implanted prosthesis

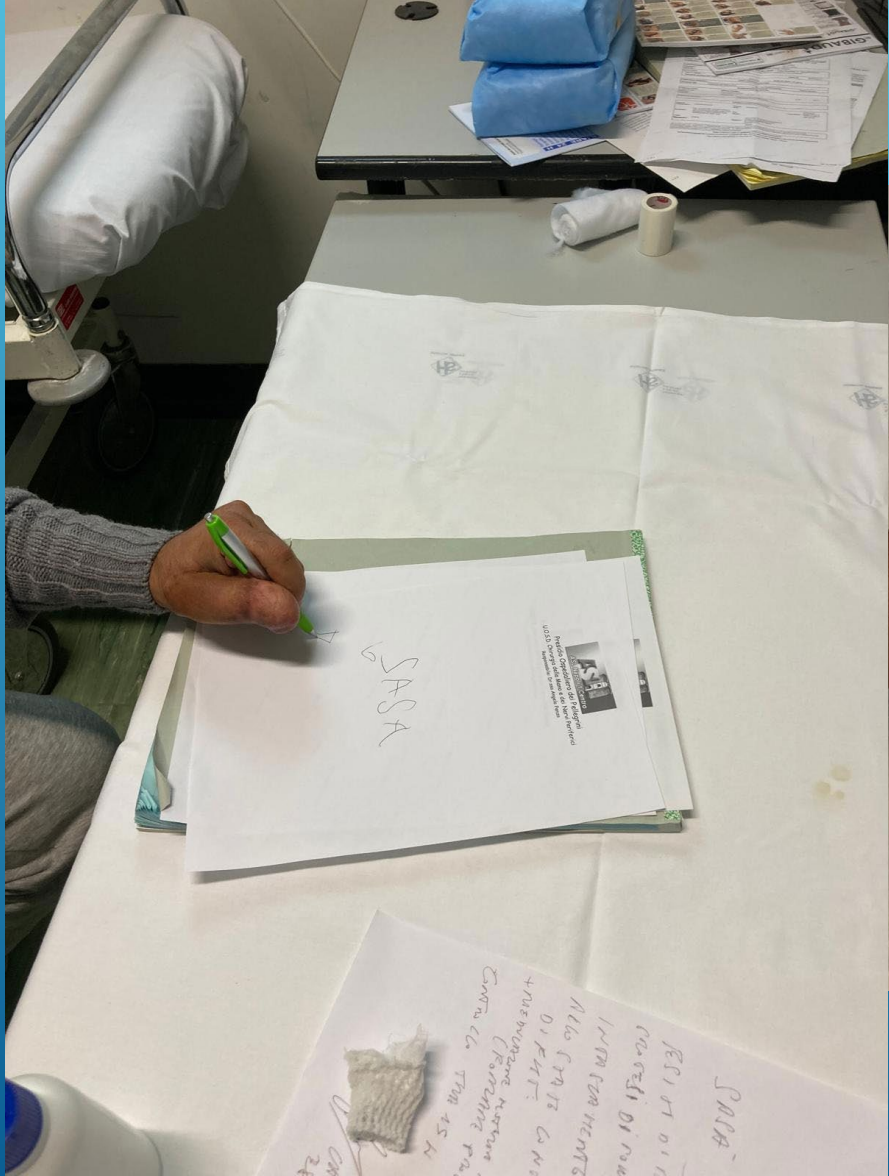


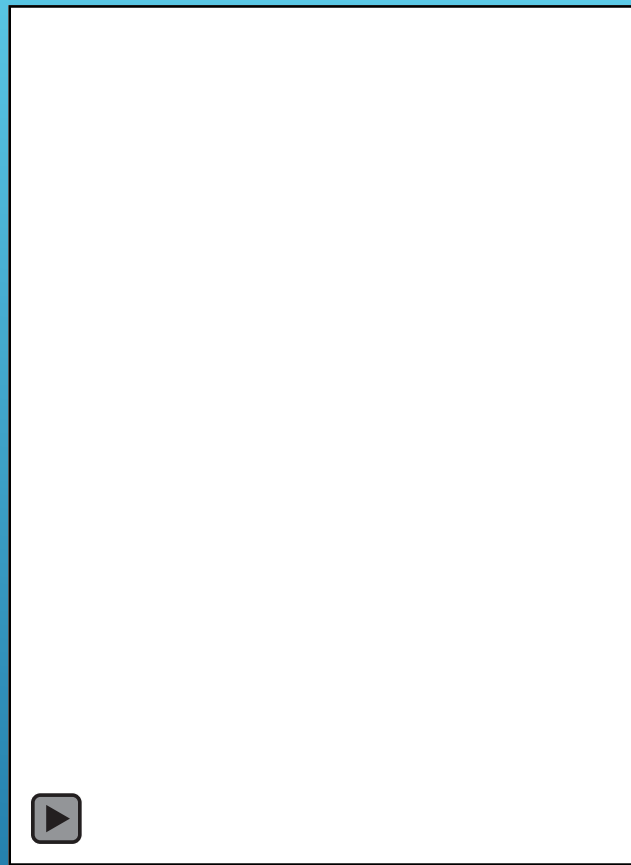
7 days check:
the flap is vascularized, clean,
soft, well-adapted





CT SCAN SHOWS EARLY OSTEOINTEGRATION OF THE IMPLANT AND CORRECT POSITION OF THE SCREWS





CASE N.2

MALE, 49 Y.O., ARTISAN

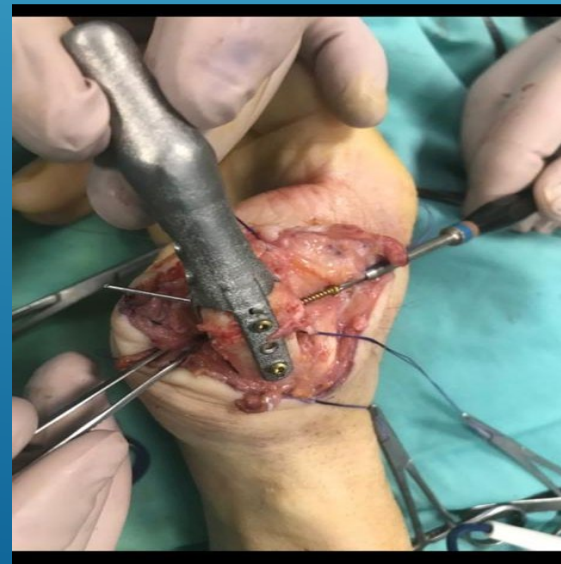
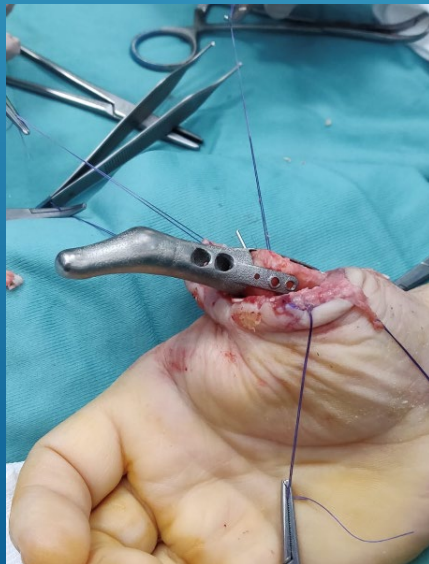
CAR ACCIDENT, JUNE 2021

POLYTRAUMA

RIGHT SHOULDER DISLOCATION AND THUMB AMPUTATION

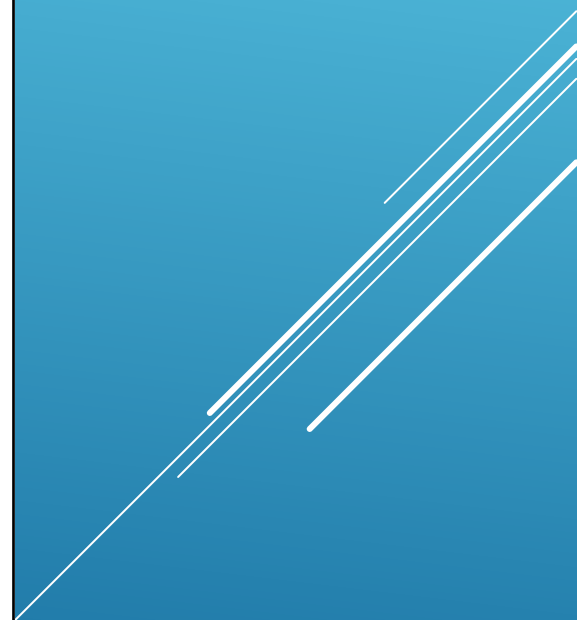
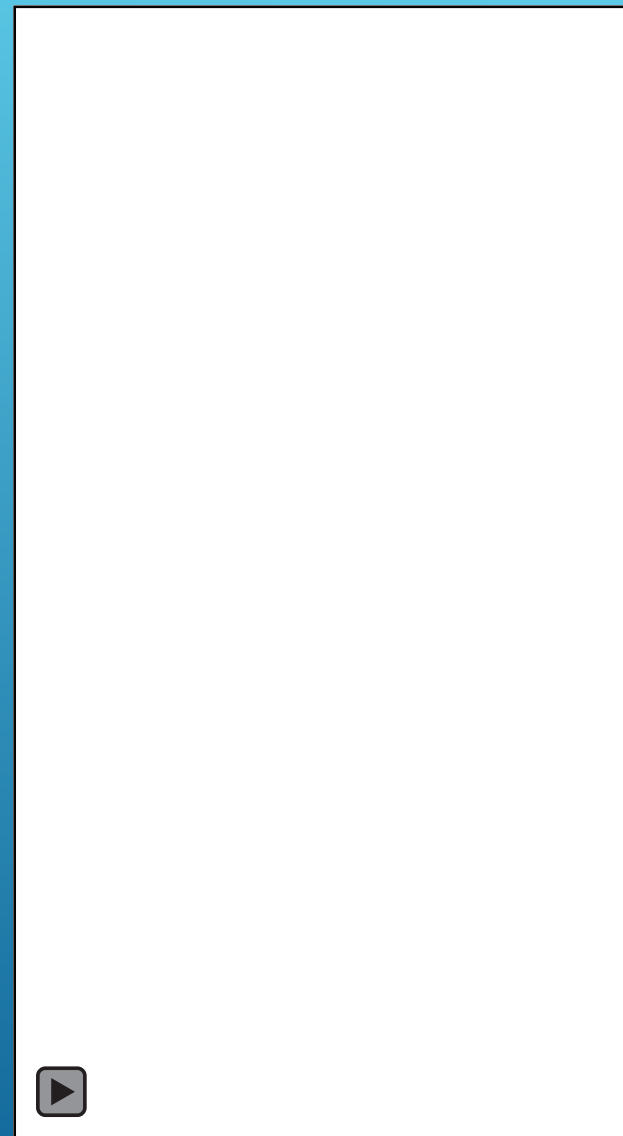
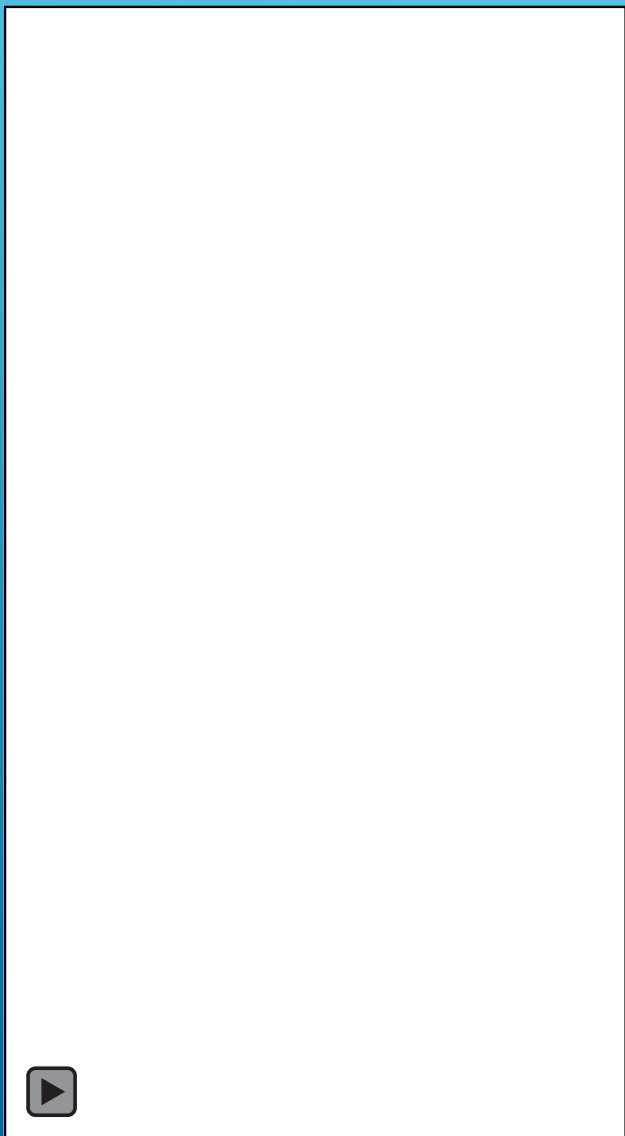
JULY, 2021: DEBRIDEMENT AND SYNTHETIC SKIN REPLACEMENT.

AUGUST, 2021: CARUSO-CIMINELLO PROSTHESIS IMPLANTATION AND MC GREGOR FLAP DRESSING. (DESAULT SHOULDER DRESSING)









CASE N.3

M.M. 55 YO, 1° FEMALE PATIENT
CAR ACCIDENT
TEACHER





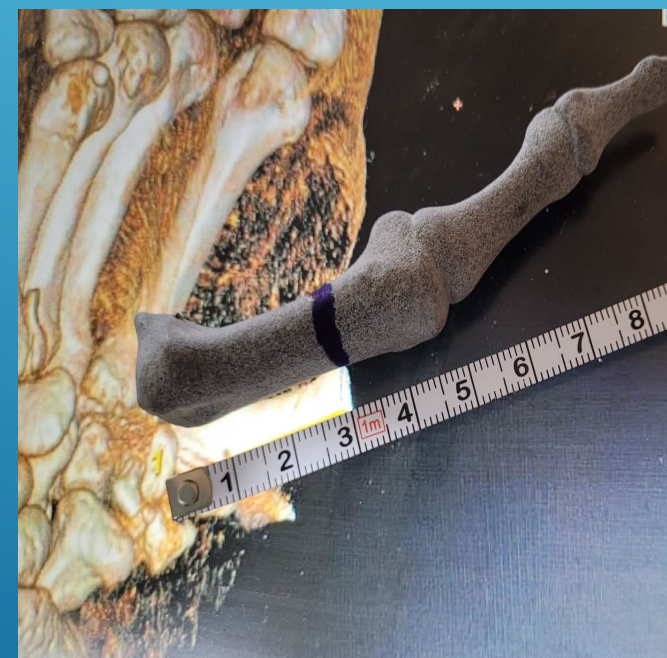


CASE N.4

G.A., 29 Y.O.

FIREWORK EXPLOSION ON 28 OF AUGUST '22

WORKER





GRAZIUSO ANTONIO
ID: 0000139074
Birthdate: 1992.09.30, Sex: M
Img #: 1/1

Gemini SRL
Acc. #: 0000125852
Modality: DX
2023.09.11 (acq)
09:33:50 (acq)

St: RX MANO DESTRA
Se: [#1] T070a Mano dv
W: 34704, L: 39504

SIZES ARE AT DETECTOR - APPROX.
SUBSAMPLED



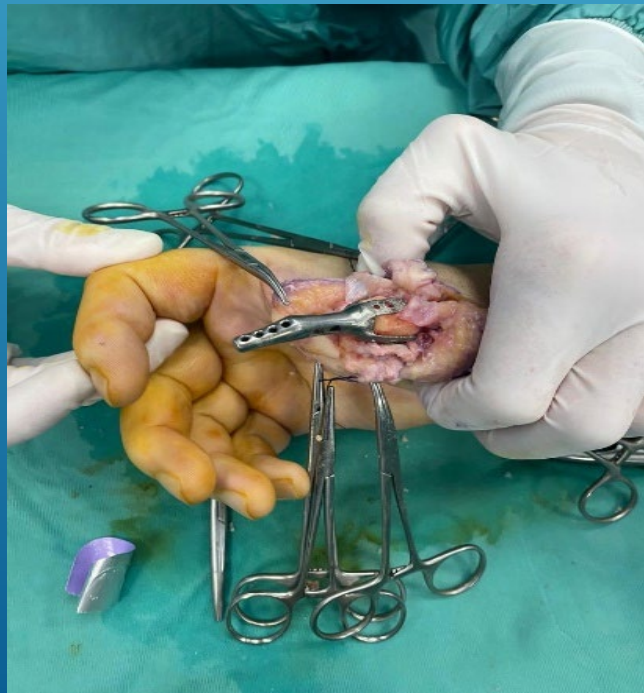
FOV 30.6 cm
ONE+/SS30 No Image Filter



CASE N.5

MALE, 45 Y.O., WORKER

ACCIDENT AT WORK WITH MACHINE (OCTOBER 2022)

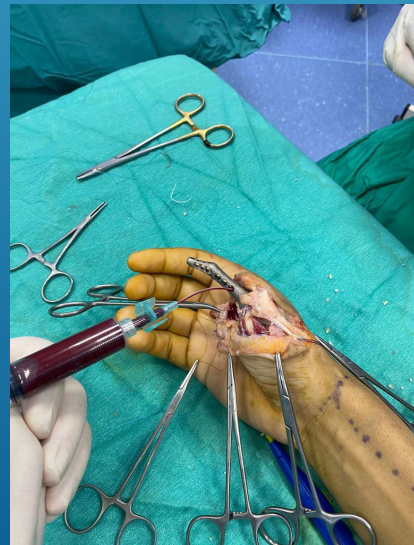
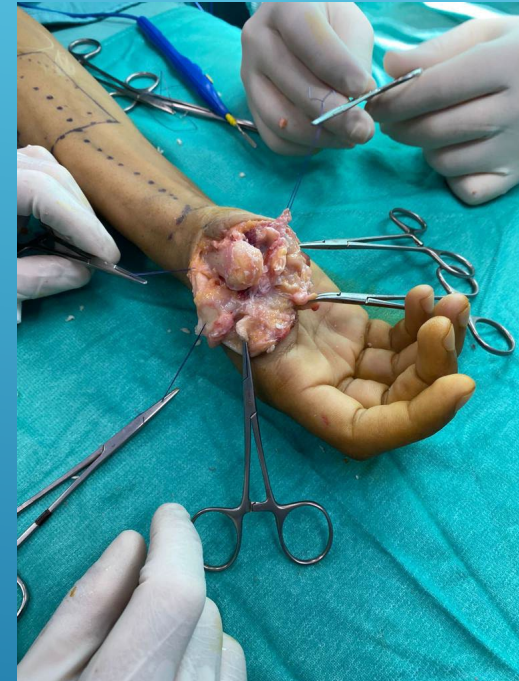
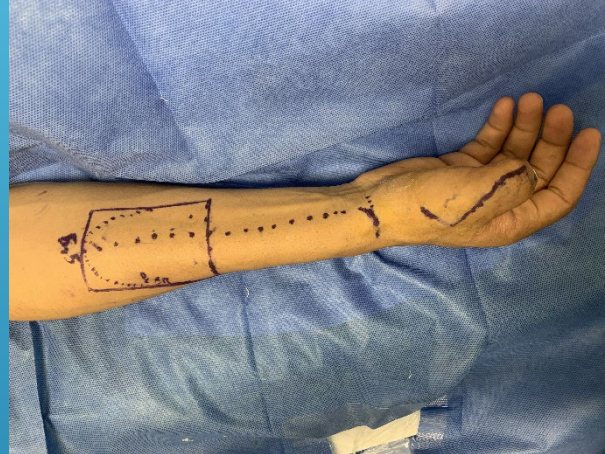




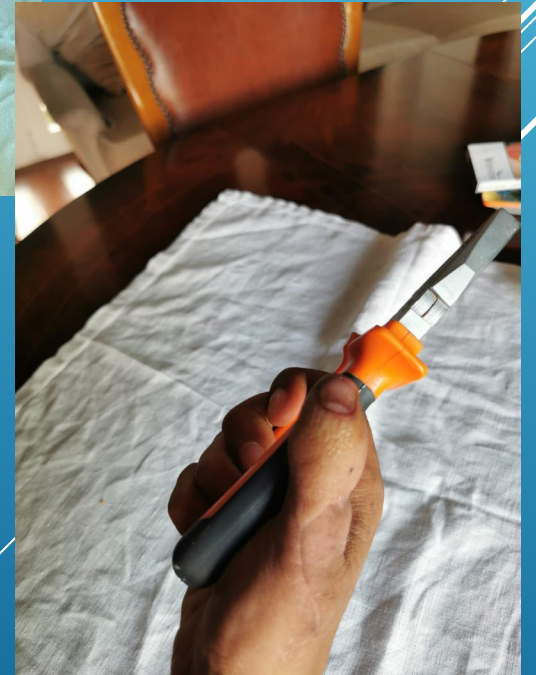
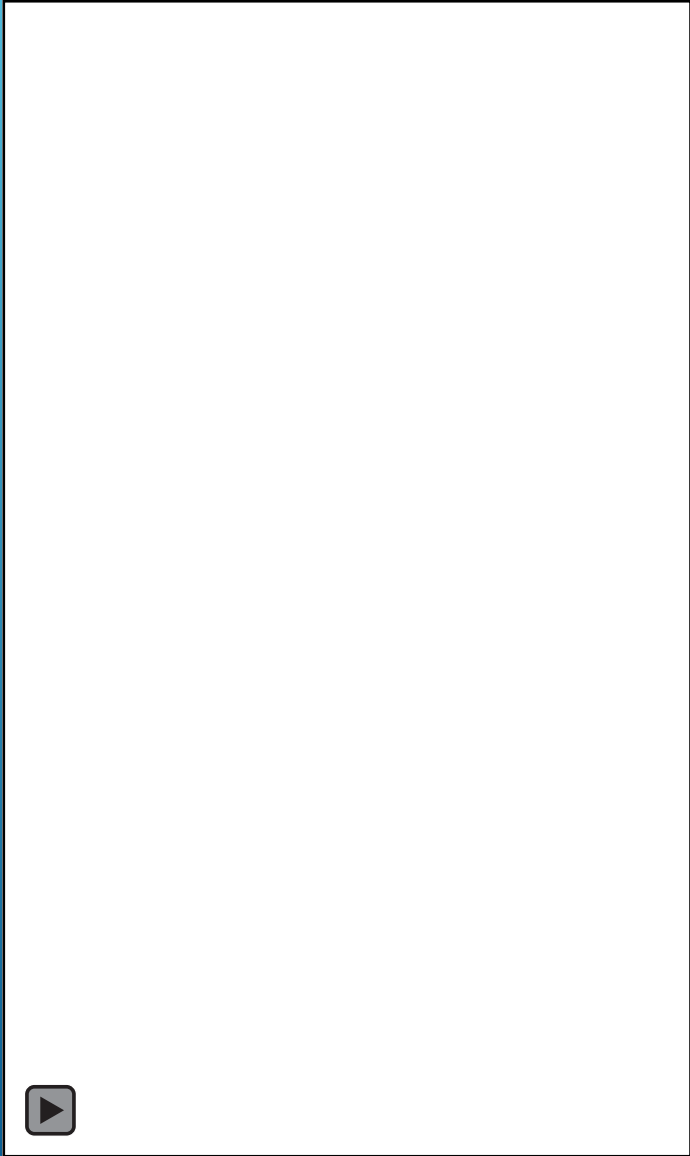
CASE N.6

MALE, 35 Y.O., WORKER

ACCIDENT AT WORK WITH MACHINE (2023)





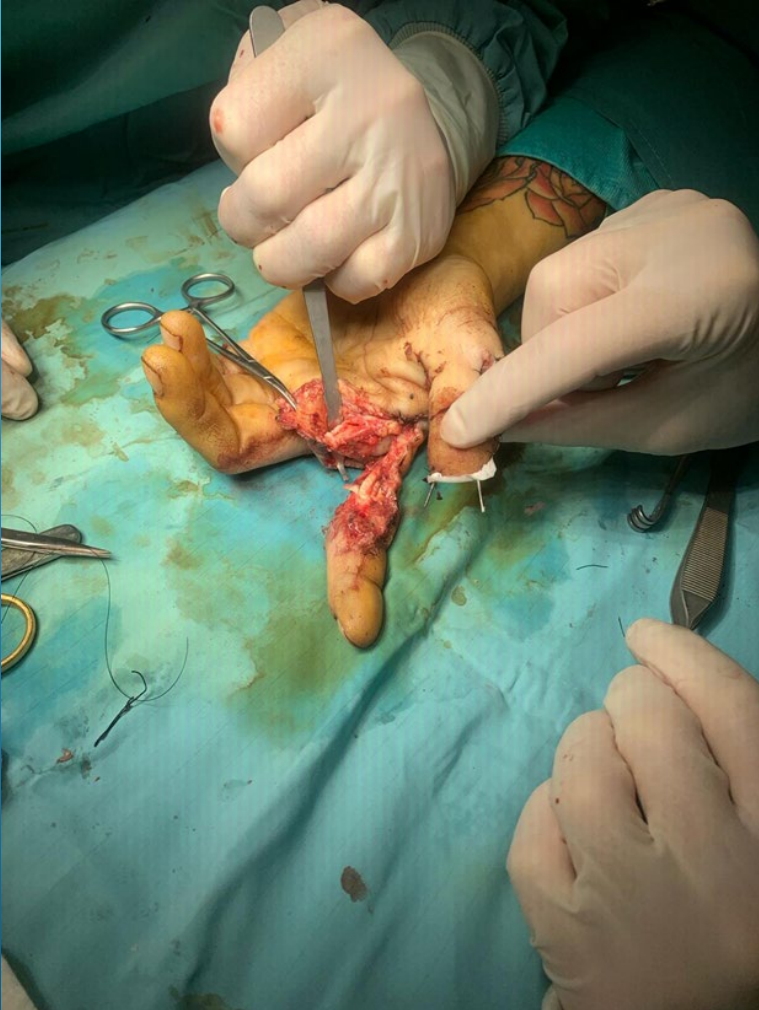




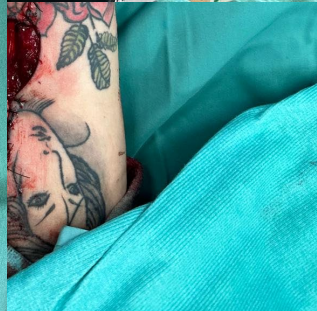
CASE N. 8

MALE, 31 Y.O.

ACCIDENT AT WORK WITH
MACHINE



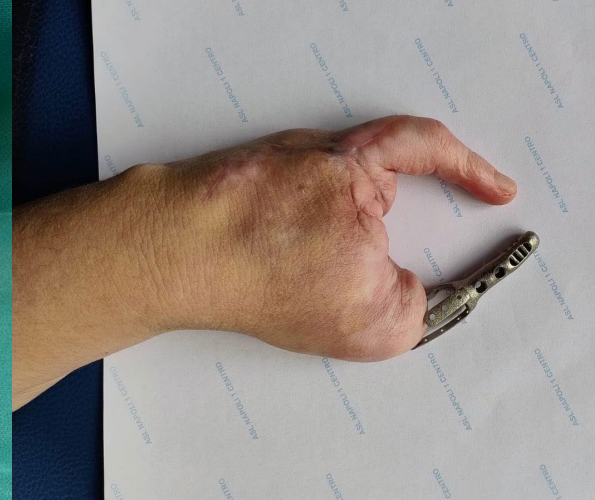




CASE N.10

FEMALE; 52 Y.O.

ROAD ACCIDENT IN EGIPT (BOTH HANDS CRUSHED BY
THE OVERTURNED BUS)







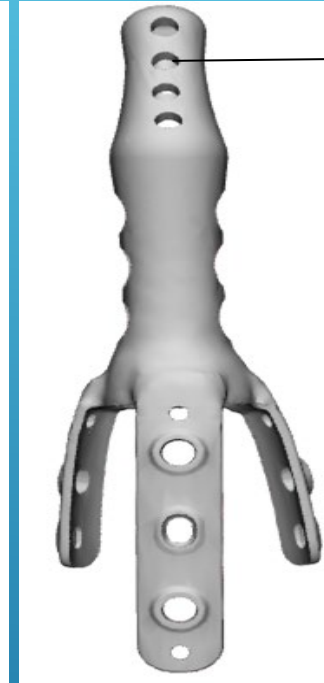
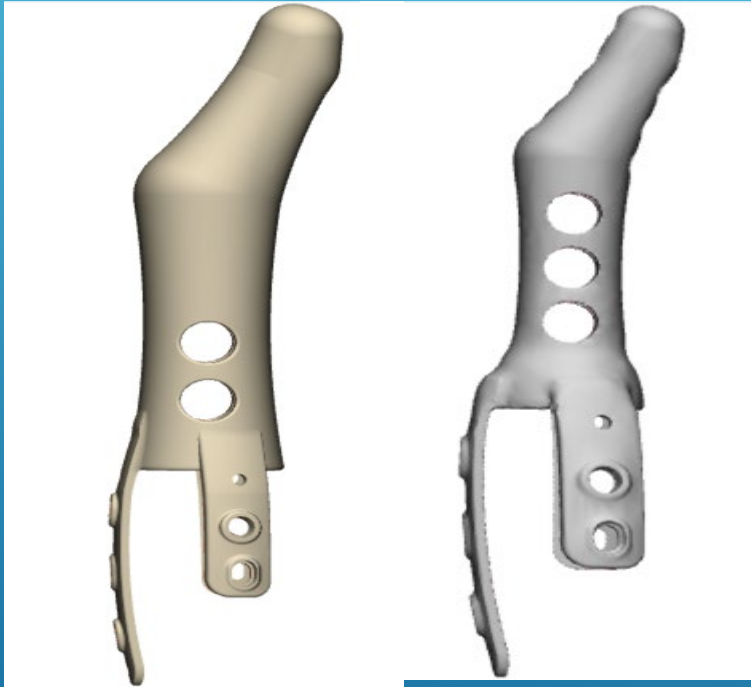


Esame: 09/09/2025
COSPIDE GIOVANNA
RX ESTREMITA SUPER Nascita: 12/07/11
Fisica

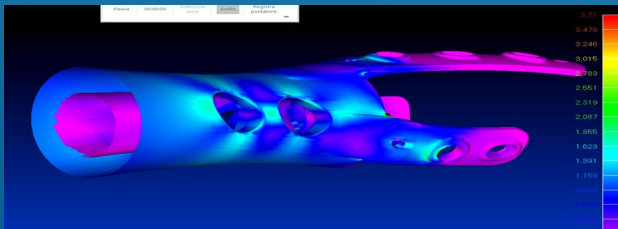
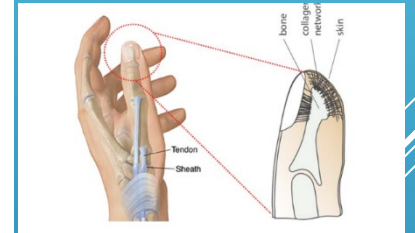




CONCLUSION –prosthesis evolution



Holes for Flap stabilization and friction reduction of the apical flap



CONCLUSION – Technical Evolution

- THE SCREWS NUMBER AND DIRECTION OPTIMIZATION IS PROVIDED.

overcharged

optimised



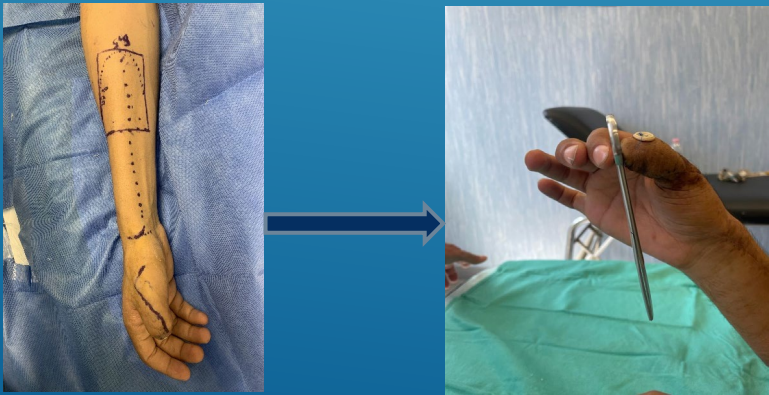
Bending load for right thumb



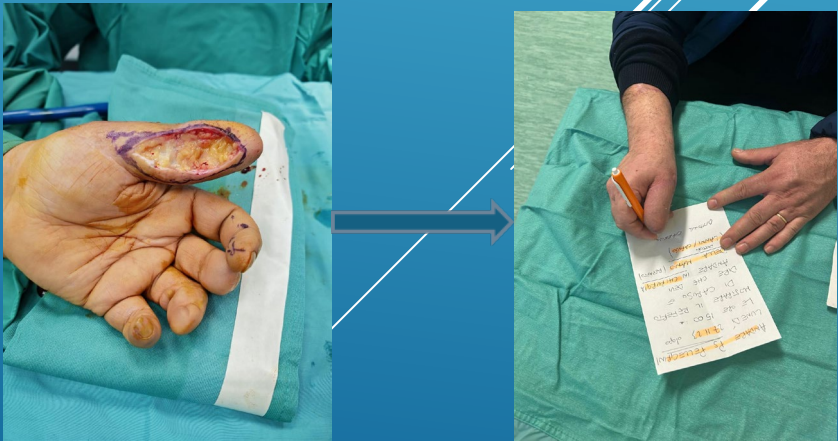
- EXTENSION OF INDICATIONS

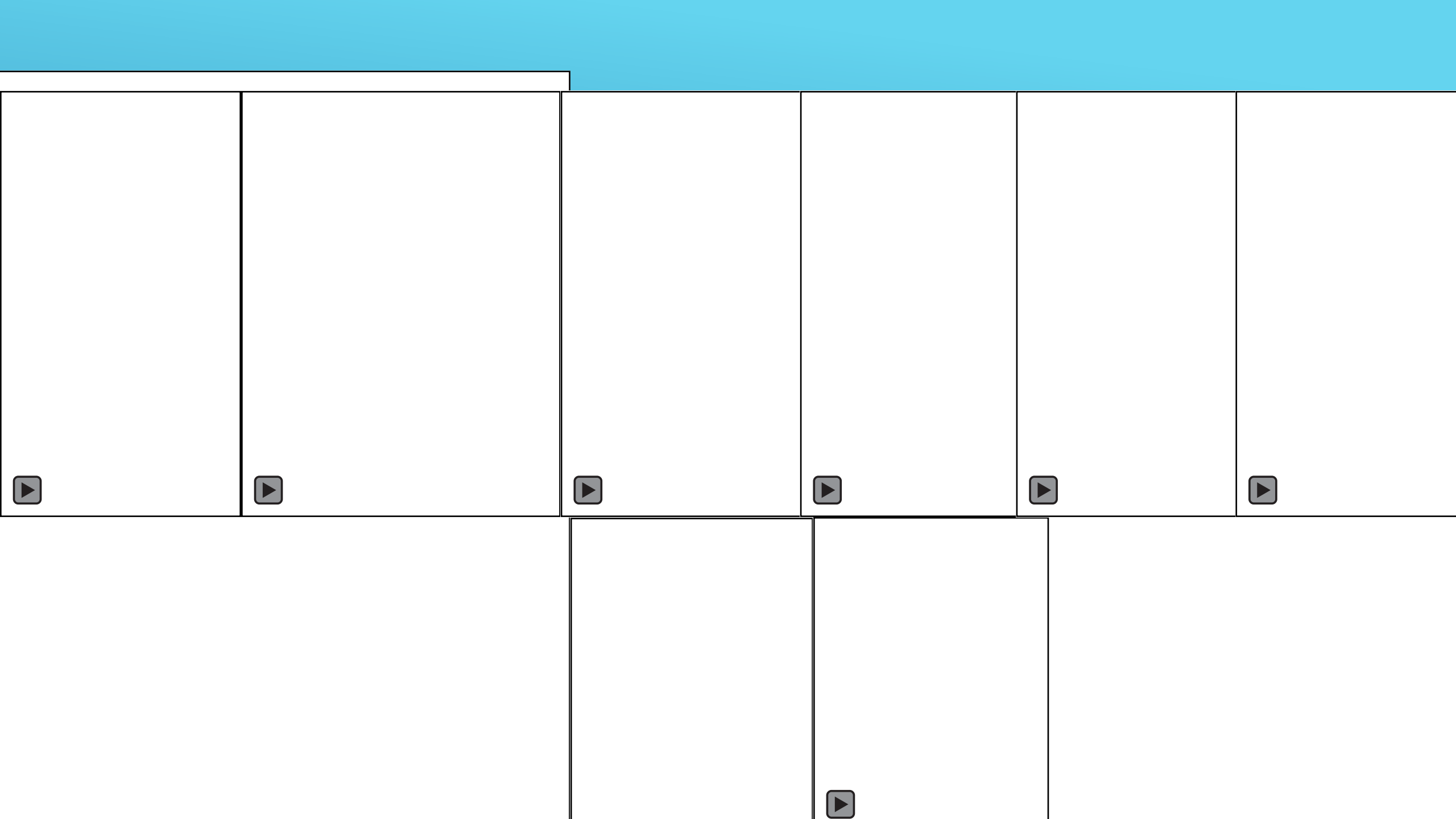


- MODIFIED RADIAL FOREARM FLAP



- DEGREASING



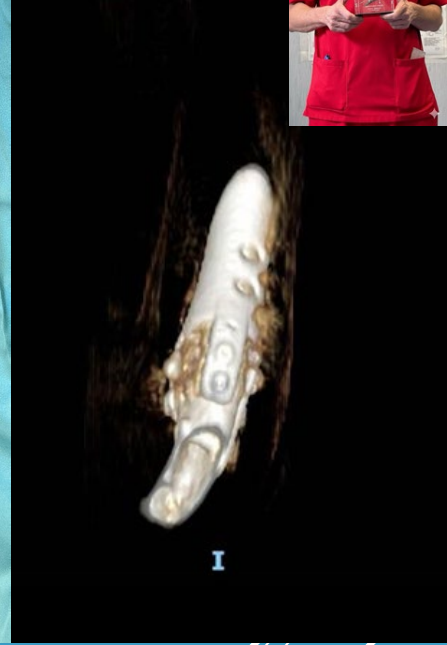


OPEN QUESTIONS:

LONGER FOLLOW UP

AESTHETIC APPEARANCE

SKIN SENSITIVITY



HAND PROSTHESIS SURGERY CLINIC



*Nasce il primo
Ambulatorio di
questo genere in
una realtà già da
anni punto di
riferimento per la
Chirurgia della
Mano.*

*Mission condivisa
è portare le
innovazioni
cliniche e
tecniche, a costi
sostenibili, a
favore delle
persone.*

Lo staff

**Responsabile Medico: Dr.
Leopoldo Caruso**

**Coordinatrice Infermieristica:
Antonietta Visone**

Infermiera: Venere De Blasio



REGIONE CAMPANIA
ASL NAPOLI 1 CENTRO



**L'Ambulatorio
Protesi e Esoprotesi
Funzionali Della
Mano**

*Presidio Ospedaliero dei Pellegrini
U.O.C Chirurgia della Mano e dei nervi Periferici
Responsabile: Dr.ssa Angela Penza
Coord. Infermieristico: Dott.ssa Antonietta Visone*



Protesi pollice Caruso-Ciminello

Come nasce l'idea?

Questo ambulatorio nasce come risorsa necessaria sul territorio, in un quadro epidemiologico in cui le mani rimangono l'organo del corpo umano statisticamente più coinvolto dagli eventi traumatici in ambito lavorativo e domestico, con una frequenza doppia rispetto alle altre parti dell'arto superiore.

A chi è rivolto?

Possono rivolgersi al nostro Ambulatorio tutte quelle persone che hanno subito sfaceli e traumi complessi della mano esitati in amputazioni del pollice o di altre dita.



I nostri obiettivi

Permettere a chi ha subito traumi complessi della mano la ripresa delle attività della vita quotidiana a costi sostenibili.



Le attività:

La prima visita effettuata dal Medico responsabile dell'Ambulatorio permetterà di analizzare e studiare la possibilità di un eventuale impianto di protesi in titanio per le amputazioni di pollice o di esoprotesi il cui funzionamento è basato su movimenti residui dell'arto superiore.

Come prenotare la prima visita:

Impegnativa Regionale cod. **897.00.017 cod. quesito diagnostico v52/v529 (collocazione e sistemazione protesi)**, presso qualsiasi CUP o Farmacia abilitata o in alternativa inviare l'impegnativa tramite mail al seguente indirizzo:

ambprotesi@aslnapoli1centro.it

Come prenotare le visite successive:

Le prenotazioni successive alla prima verranno prenotate direttamente in ambulatorio

Orari:

Ambulatorio mensile (Mercoledì)
dalle 15:00 alle 18:00

Contatti:

Telefono: 081-2543336

Email: ambprotesi@aslnapoli1centro.it





Thanks!

