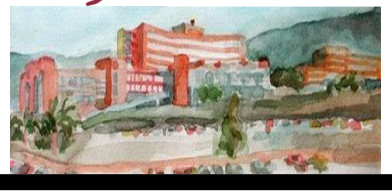
SESSIONE CONGIUNTA
ITALIA-SPAGNA

PSEUDOARTROSI INFETTE (NONUNIONI INFETTE) IN SPAGNA

Dott. César Salcedo Cánovas
MD PhD IP

Servicio Murciano de Salud

Arrixaca
Hospital Clínico Universitario
Virgen de la Arrixaca



GOBIERNO DE ESPAÑA
MINISTERIO DE SANIDAD

CSUR-UNIDAD DE REFERENCIA NACIONAL EN ORTOPEDIA INFANTIL

CSUR-UNIDAD DE REFERENCIA NACIONAL EN PATOLOGÍA SÉPTICA Y RECONSTRUCCIÓN DEL APARATO LOCOMOTOR

IMIB
Instituto Murciano de Investigación Biosanitaria Pascual Parrilla

Unión Europea

ERN BOND
EUROPEAN REFERENCE NETWORK ON RARE BONE DISEASES

UNIVERSIDAD DE MURCIA

REAL ACADEMIA DE MEDICINA DE MURCIA

GOBIERNO DE ESPAÑA

UNITÀ DI RIFERIMENTO NAZIONALE CSUR PATOLOGIA SETTICA DELL'APPARATO MUSCOLO-SCHELETRICO

MINISTERIO DE SANIDAD

SNS
Sistema Nacional de Salud

Unidad de Patología Séptica y Reconstructiva del Aparato Locomotor

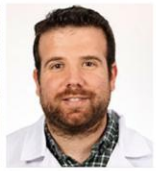
Murcia

Hospital Clínico Universitario Virgen de la Arrixaca

Trauma

Dr. C. Salcedo

Dr. J. Molina Ros



Dr. J Martínez

Medicina Infecciosas

Radiología

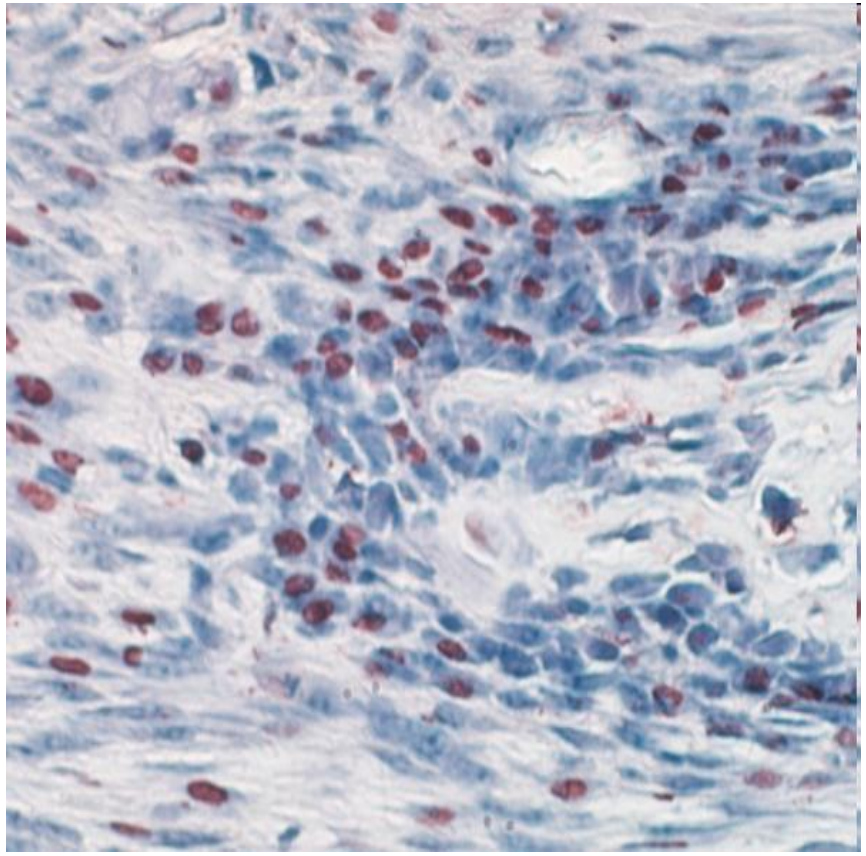
Microbiología

Cirugía Plástica

DIVENNE FAMOSO NELLA SUA TERRA... DURANTE IL TRATTAMENTO
UN ATLETA D'ÉLITE

V. BRUMEL

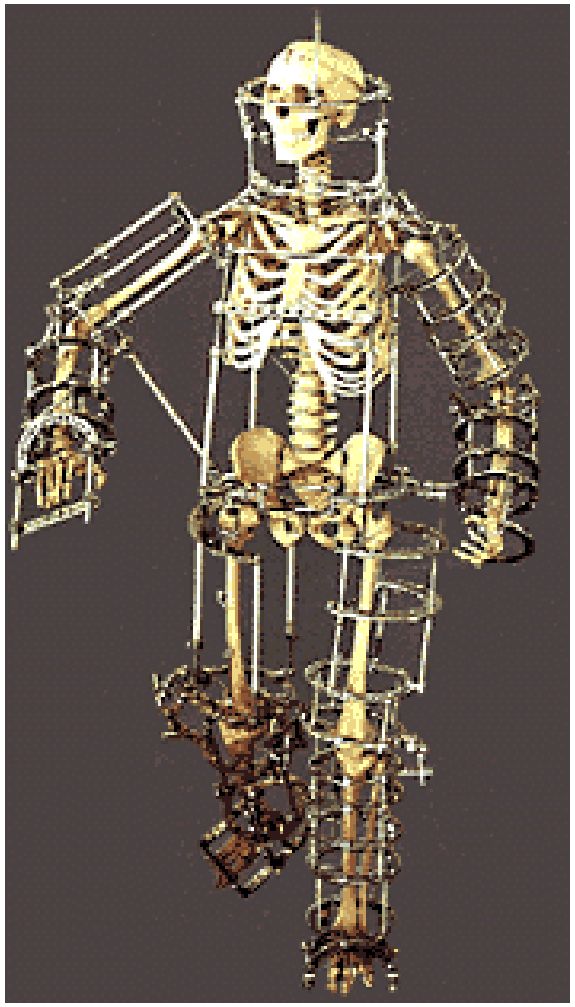
BIOLOGIA



CELLULE

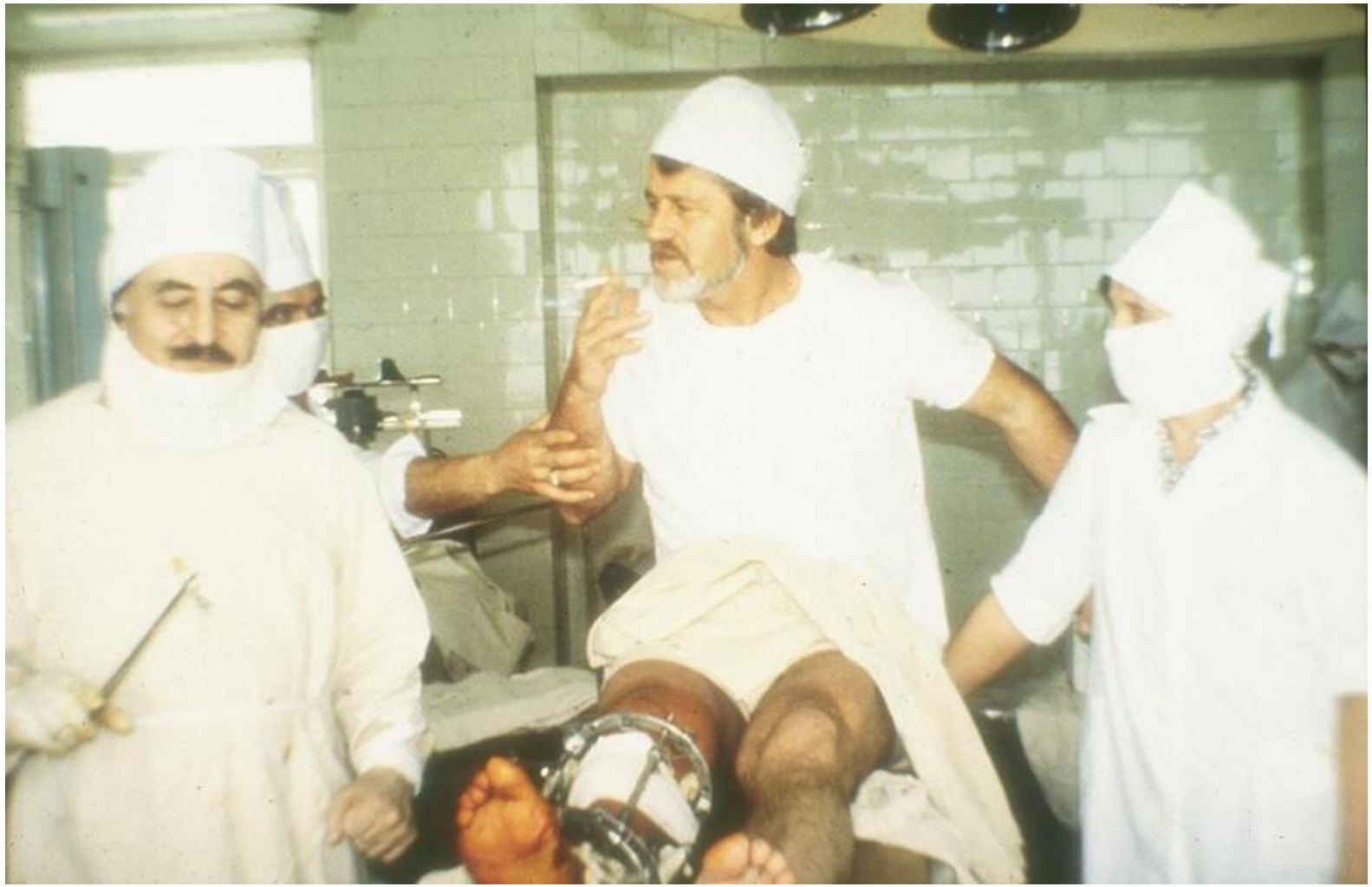
+

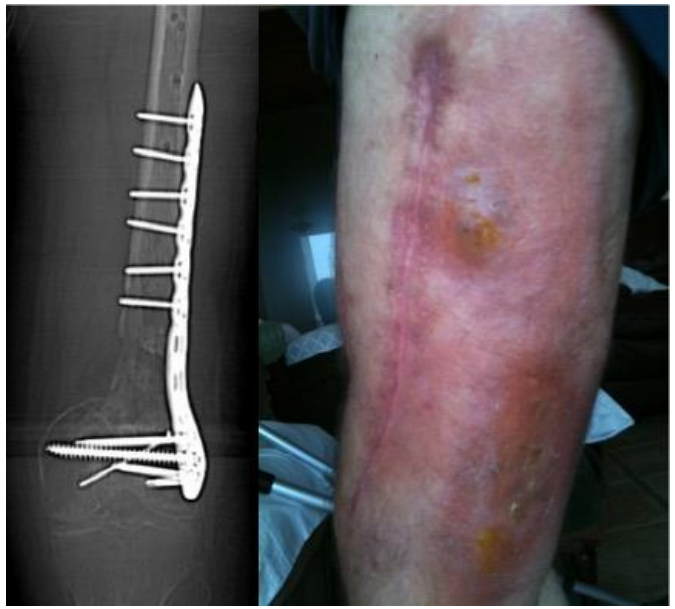
MECCANICA

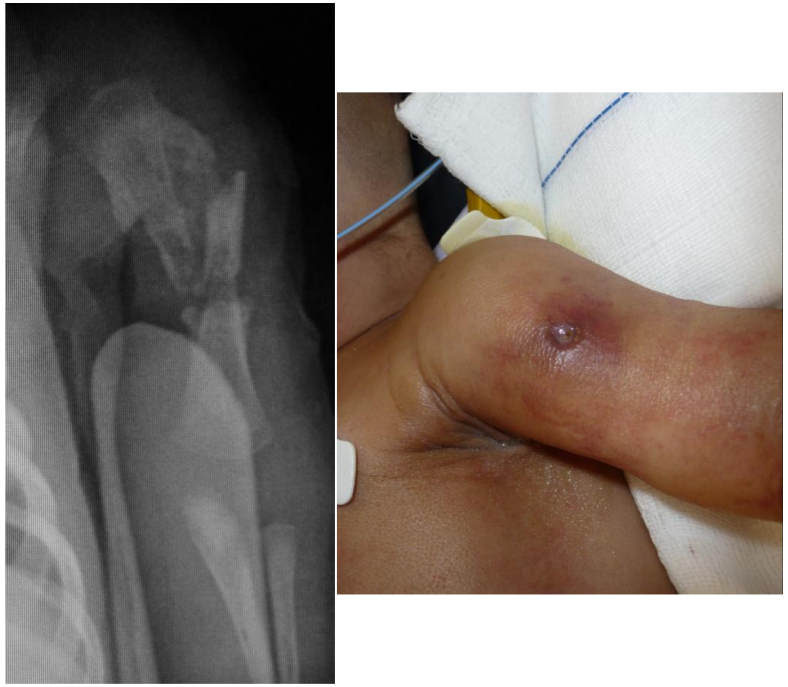


FISSAZIONE ESTERNA

UN SALTO NEL MONDO OCCIDENTALE...
QUANDO SI HA A CHE FARE CON IL GIORNALISTA E L'ALPINISTA CARLO MAURI (PRIMI ANNI '80)







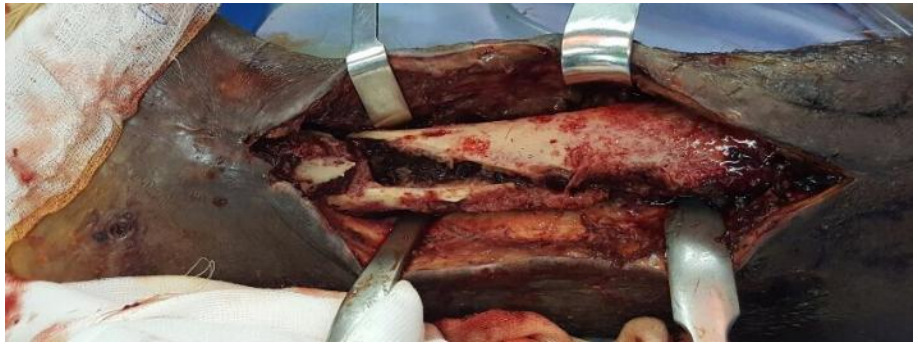
PATOLOGIA ALTAMENTE COMPLESSA

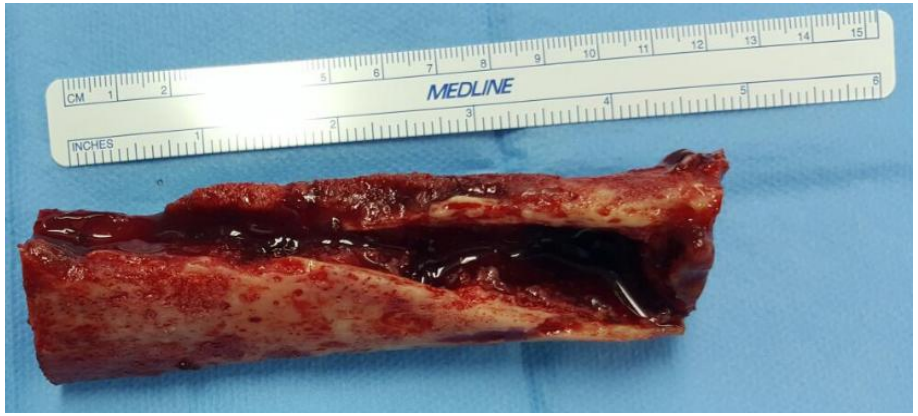
OTTIMIZZAZIONE CLINICA E PSICOLOGICA DEL PAZIENTE.

DX MICROBIOLOGICO CORRETTO E ATB TTO OTTIMALE.

SBRIGLIAMENTO RADICALE OSSEO-PB E SUA RICOSTRUZIONE

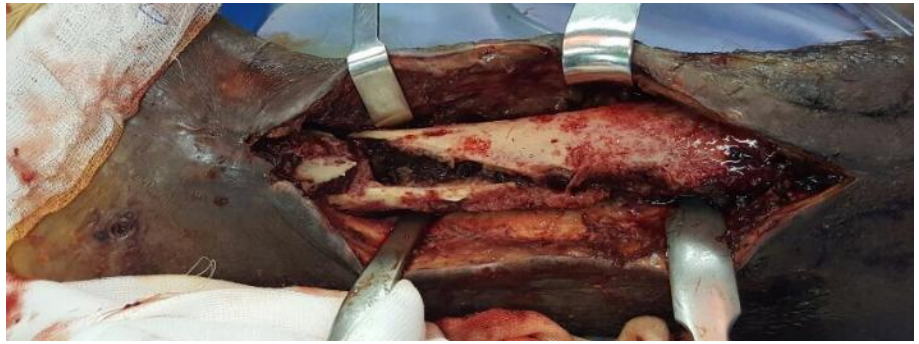
APPROCCIO MULTIDISCIPLINARE

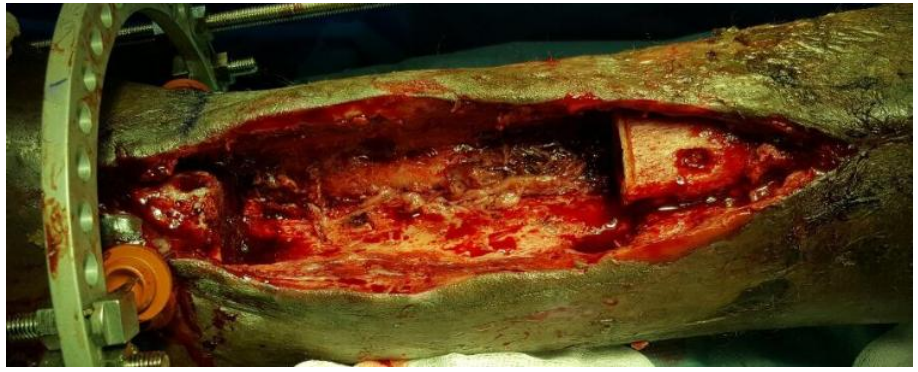


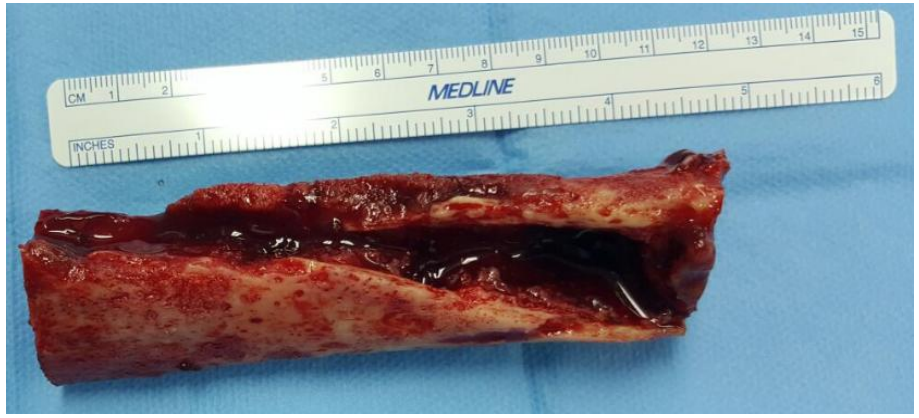


LO SBRIGLIAMENTO È LA PARTE FONDAMENTALE DEL NOSTRO TRATTAMENTO

- L'ATB NON AGISCE SUL BIOFILM MATURO.
- IL TESSUTO OSSEO NECROTICO NON SI RIGENERA.
- LA MAGGIOR PARTE DEGLI ERRORI SONO DOVUTI A ERRORI NELLO SBRIGLIAMENTO.







MA QUANTE OSSA DEVO SBRIGLIARE?

- NON PREVEDIBILE PRE-CHIRURGICAMENTE.

- DECISIONE INTRACHIRURGICA

"SEGNO DELLA PAPRIKA"

IMBARCO PSEUDO-ONCOLOGICO

RESEZIONE DI TUTTO IL TESSUTO INTERESSATO, CON MARGINE LIBERO > 5 mm

+

TRATTAMENTO LOCALE E SISTEMICO DELL'ATB

THE JOURNAL OF BONE & JOINT SURGERY (BJ)

Chronic osteomyelitis

THE EFFECT OF THE EXTENT OF SURGICAL RESECTION ON INFECTION-FREE SURVIVAL

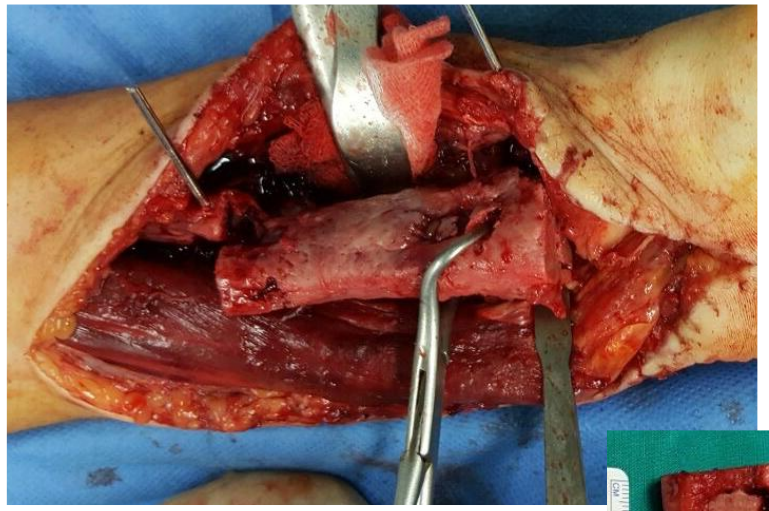
A. H. R. W. Simpson, M. Deakin, J. M. Latham

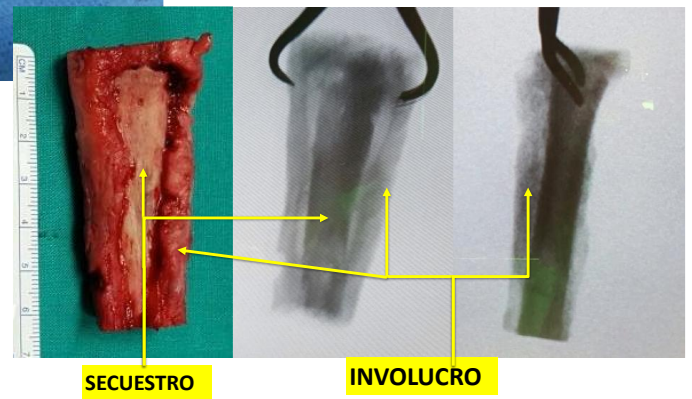
From the Nuffield Department of Orthopaedic Surgery, Oxford, England

Gruppo 1. R. radicale – bordi liberi – 0% di recidiva

Gruppo 2. R. marginale – 28% di recidiva

Gruppo 3. R. incompleto - 100% di recidiva

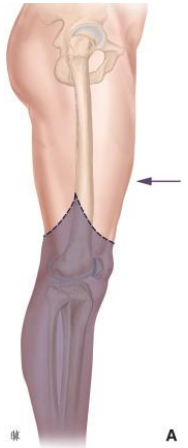




OPZIONI RICOSTRUTTIVE PER DIFETTI OSSEI

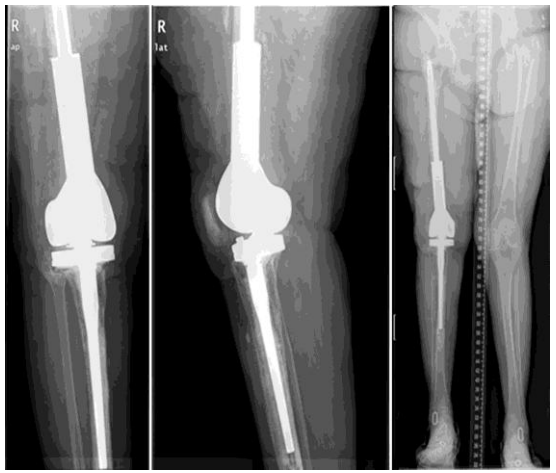
AMPUTAZIONE

- STATO VASCOLARE
- PB
- STATO NV
- FUNZIONE FINALE

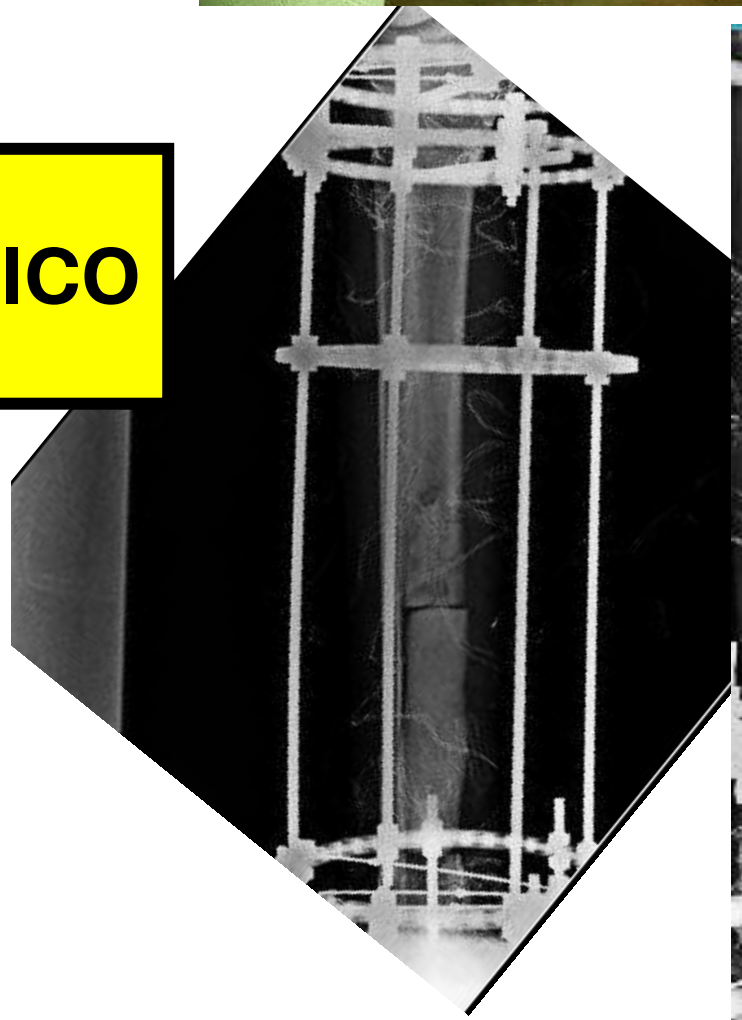


NON BIOLOGICO

- MEGAPRÓTRESIS
- MODELLI 3D.



BIOLOGICO



SALVATAGGIO DEGLI ARTI

"INDIVIDUALIZZARE I CASI"

PREFERIBILE SE:

PRESTAZIONE FINALE PRESUMIBILMENTE SODDISFACENTE.

+

BASSO RISCHIO DI RECIDIVA.

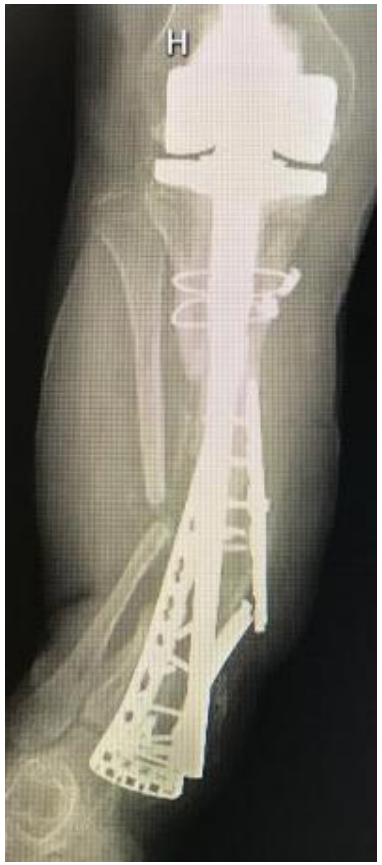
+

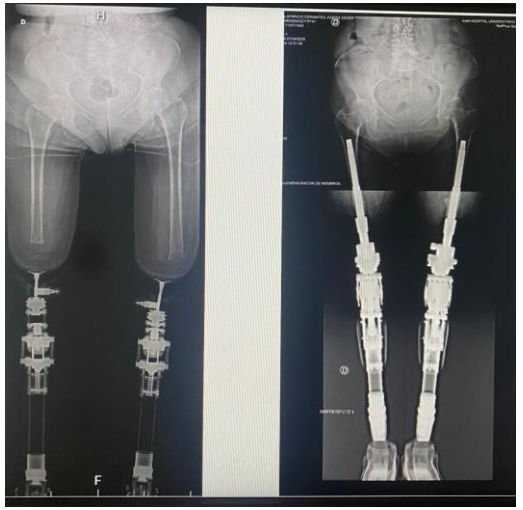
IL TEMPO E LE COMPLICAZIONI PER RAGGIUNGERLO SONO RAGIONEVOLI. .

VS

AMPUTAZIONE

NON È UN FALLIMENTO



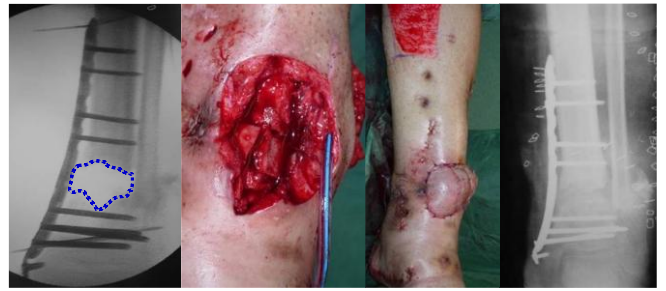


BIOLOGICO OPZIONI RICOSTRUTTIVE

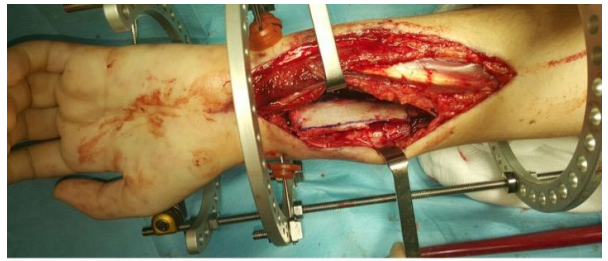
TECNICHE RICOSTRUTTIVE DIFETTI SEGMENTALI

SOSTITUIRE L'OSSO

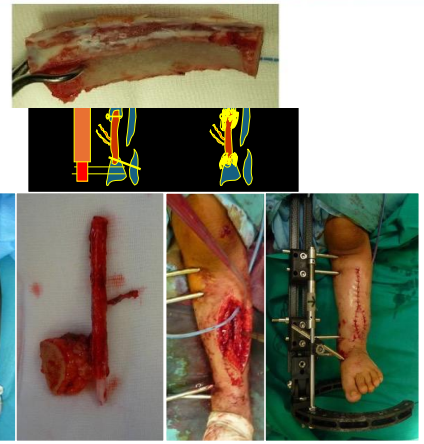
- AUTOTRAPIANTO OSSEO



- TECNICA DE MASQUELET



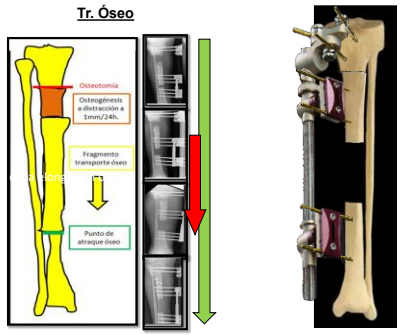
- LEMBO OSSEO VASCOLARIZZATO



RIGENERARE L'OSSO

- OSTEOGESI DA DISTRAZIONE

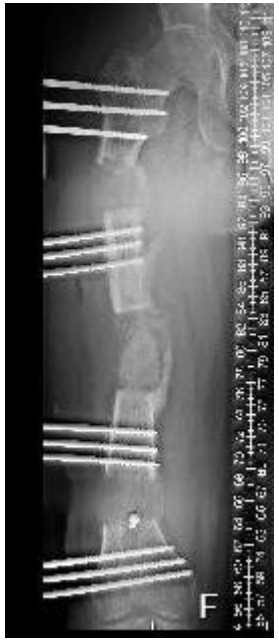
OSTEOGÉNESIS A DISTRACCIÓN: TRANSPORTE ÓSEO



Tipo di FE

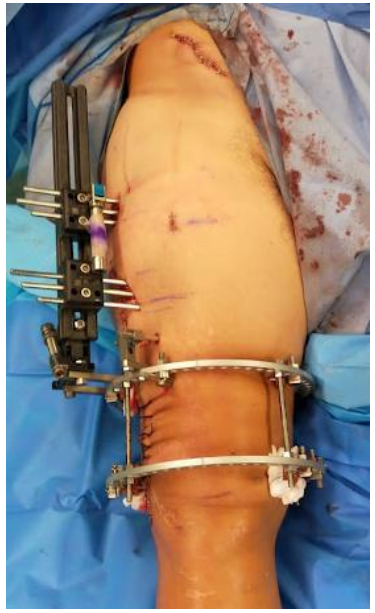
MONOLATERALE

FEMORE
DIAFISARIO



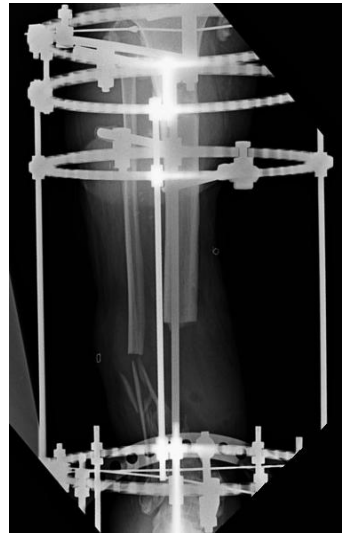
IBRIDO

FEMORE
MET- DIAF

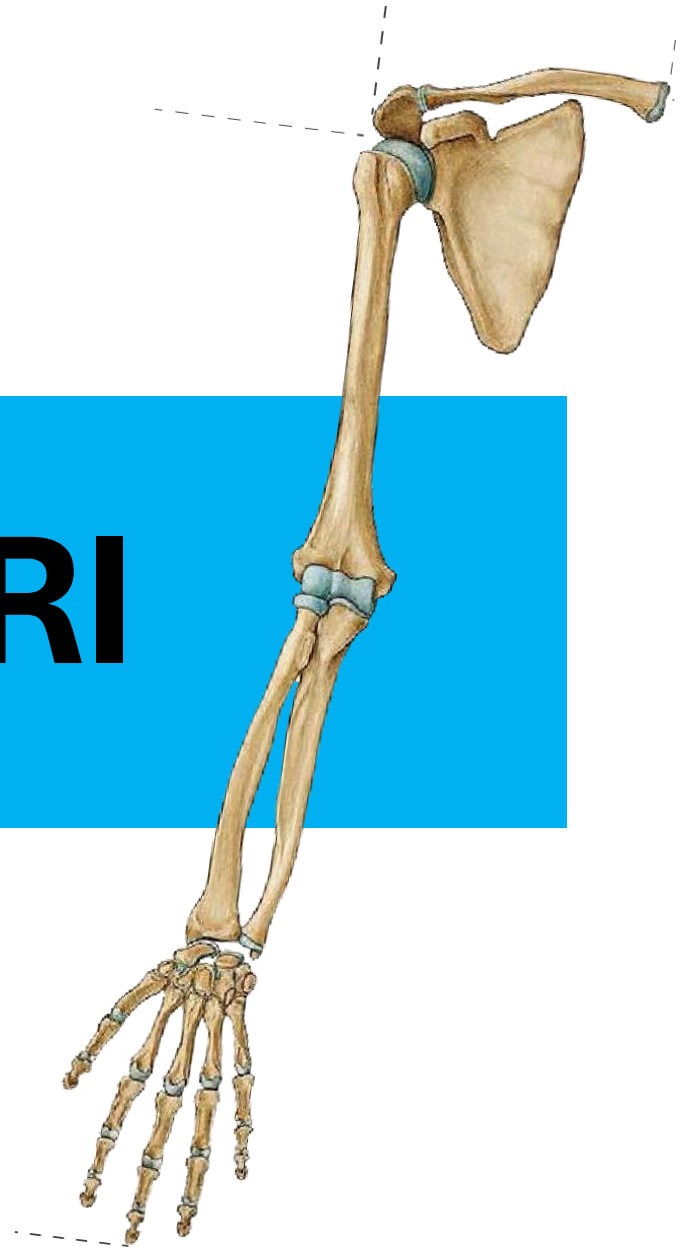


CIRCOLARE

TIBIA

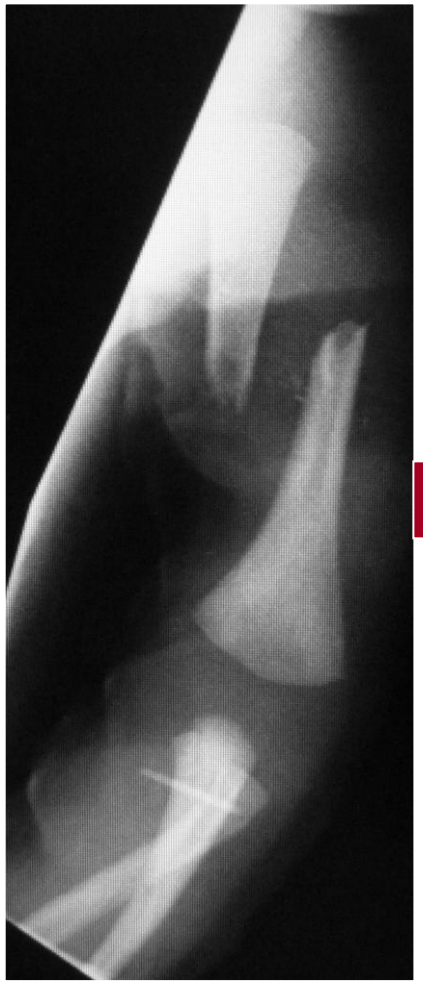


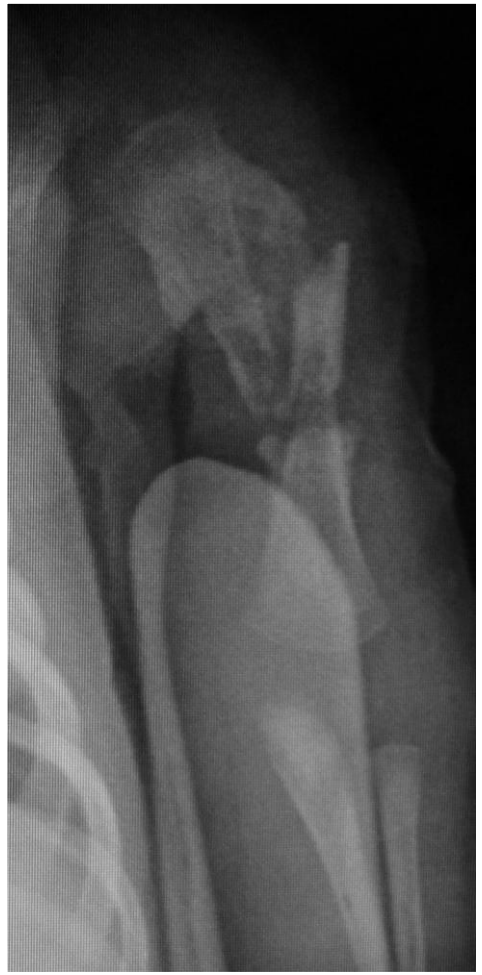
ARTI SUPERIORI

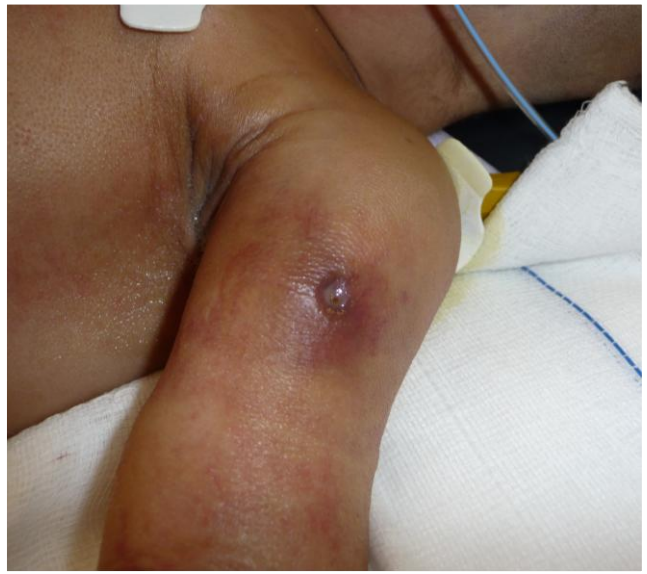


FRATTURA OSTETRICA DELL'OMERO

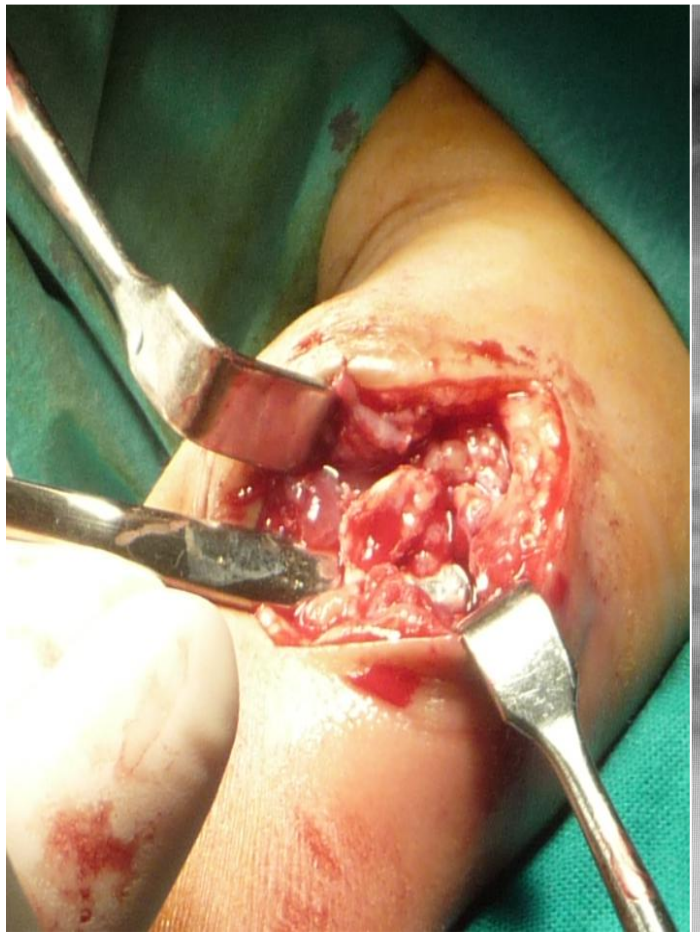
EVOLUZIONE DI 1 MESE TRA LA FRATTURA INIZIALE E LA FRATTURA PSEUDOSETTICA (KLEBSIELA PNEUMONIAE)

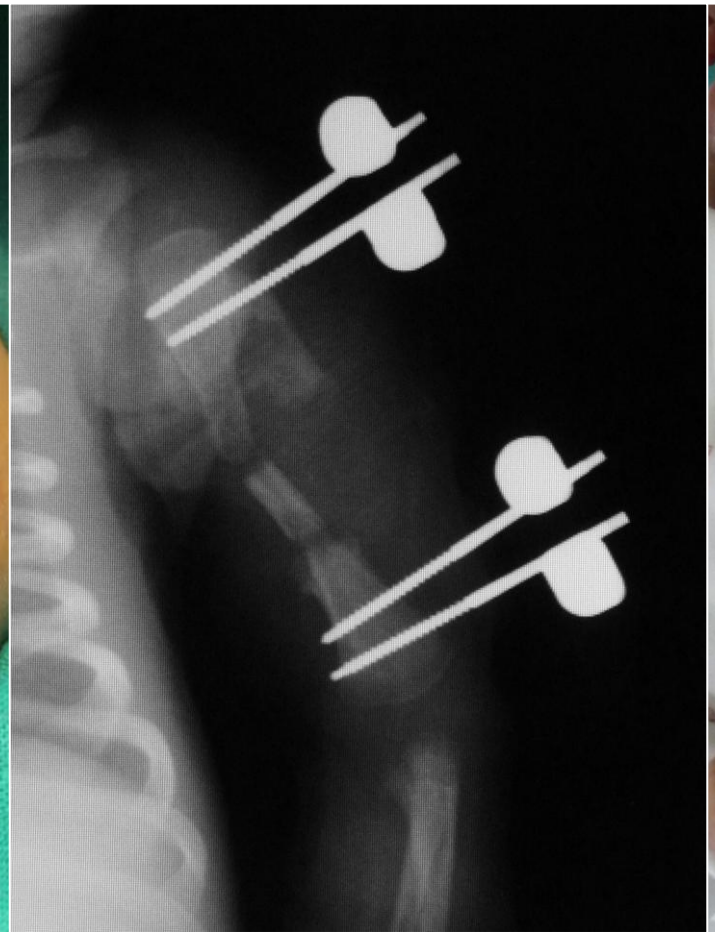




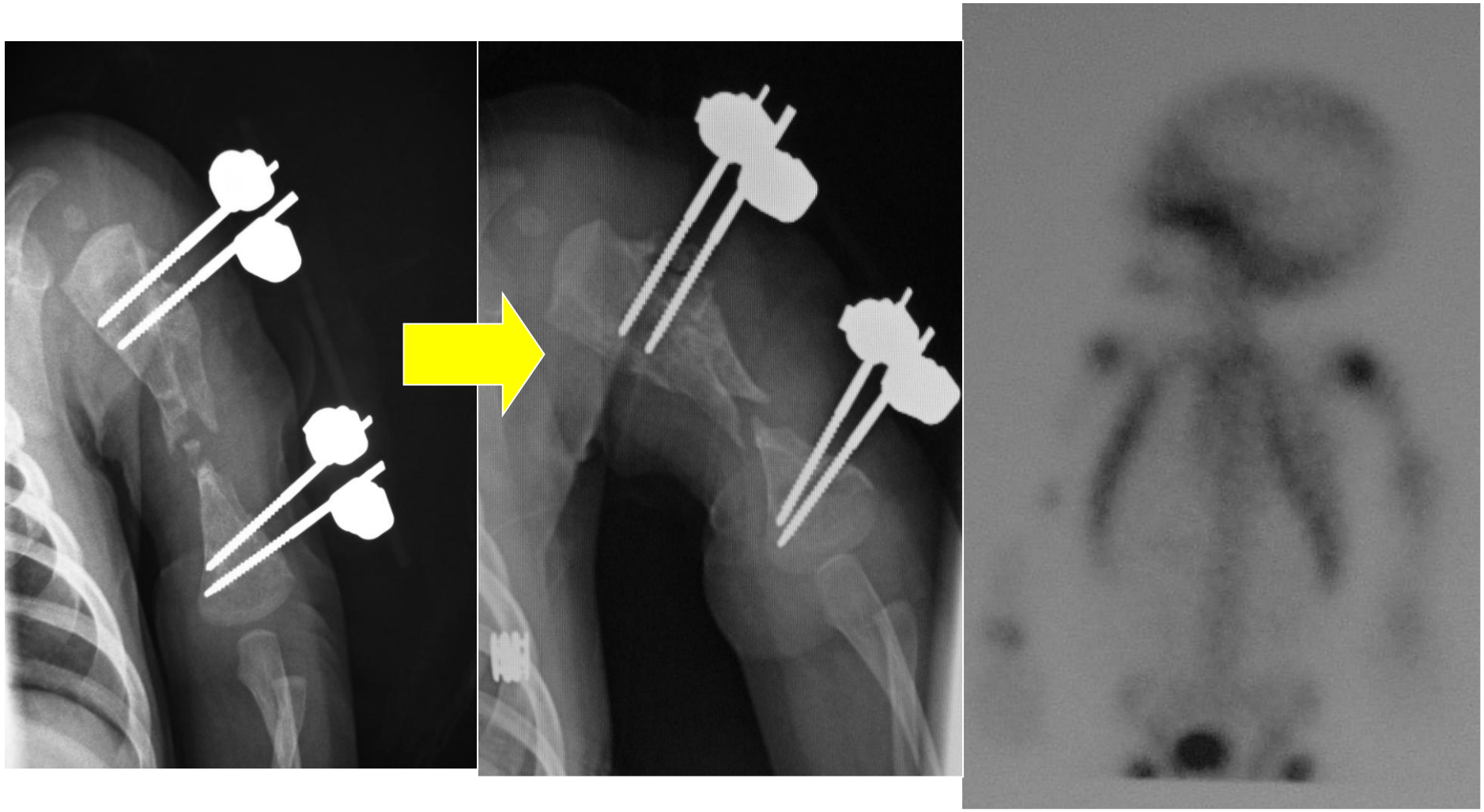


SBRIGLIAMENTO CHIRURGICO
E STABILIZZAZIONE CON MICRO-FISSATORE ESTERNO

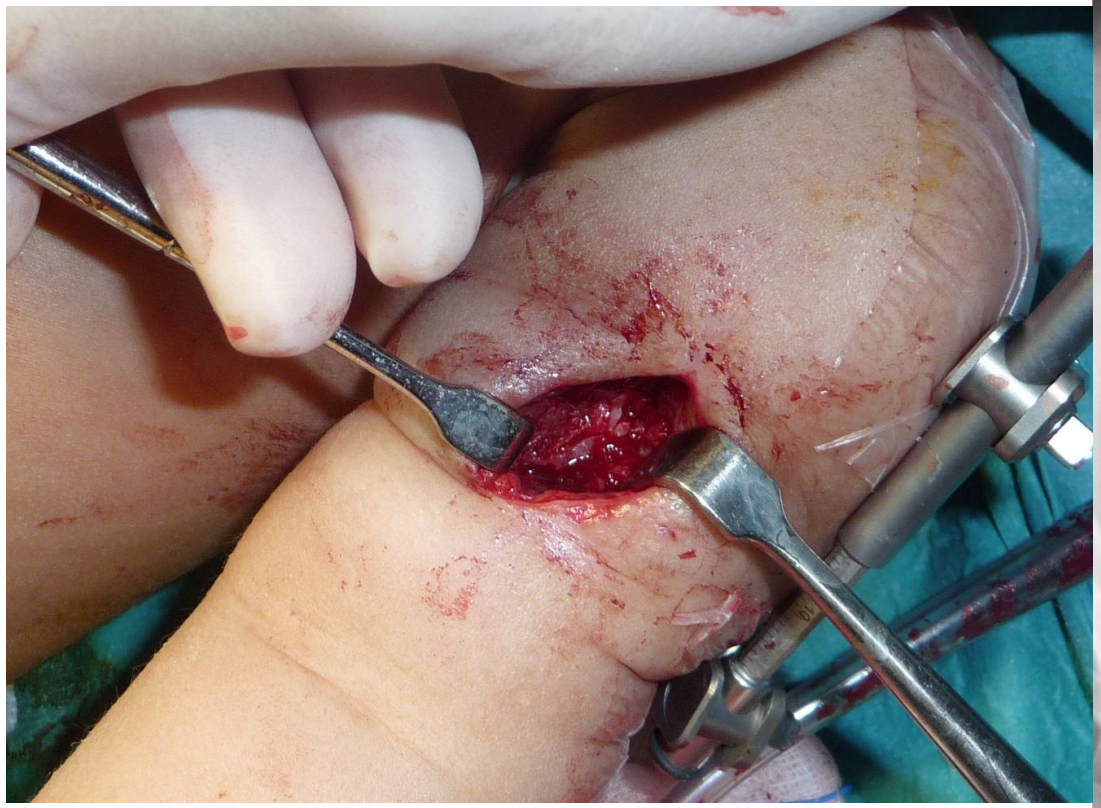


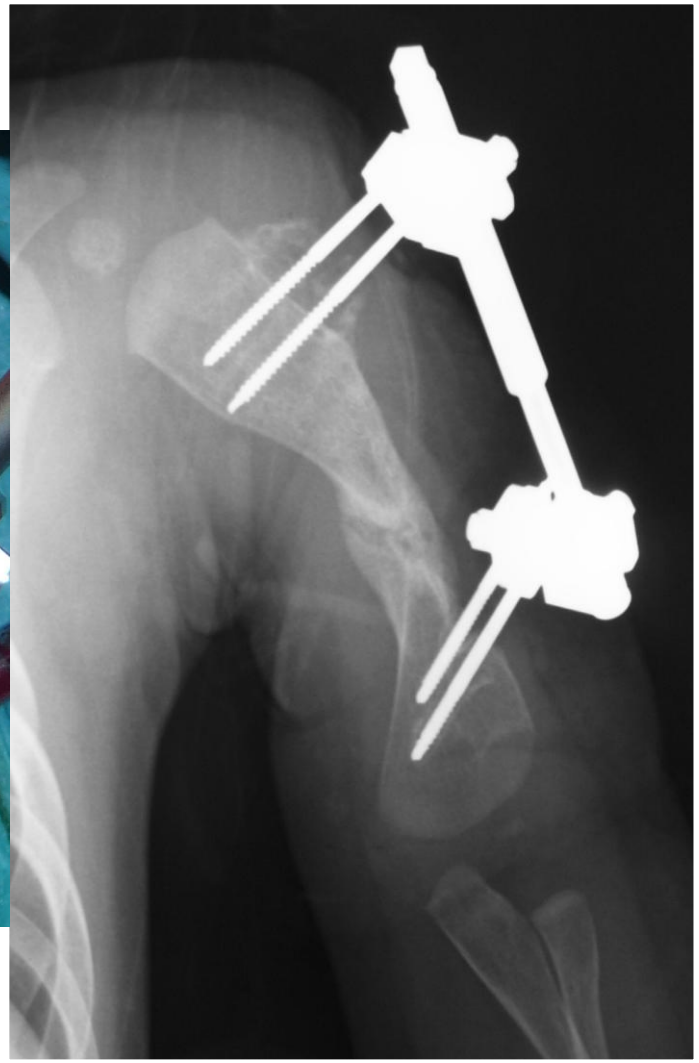


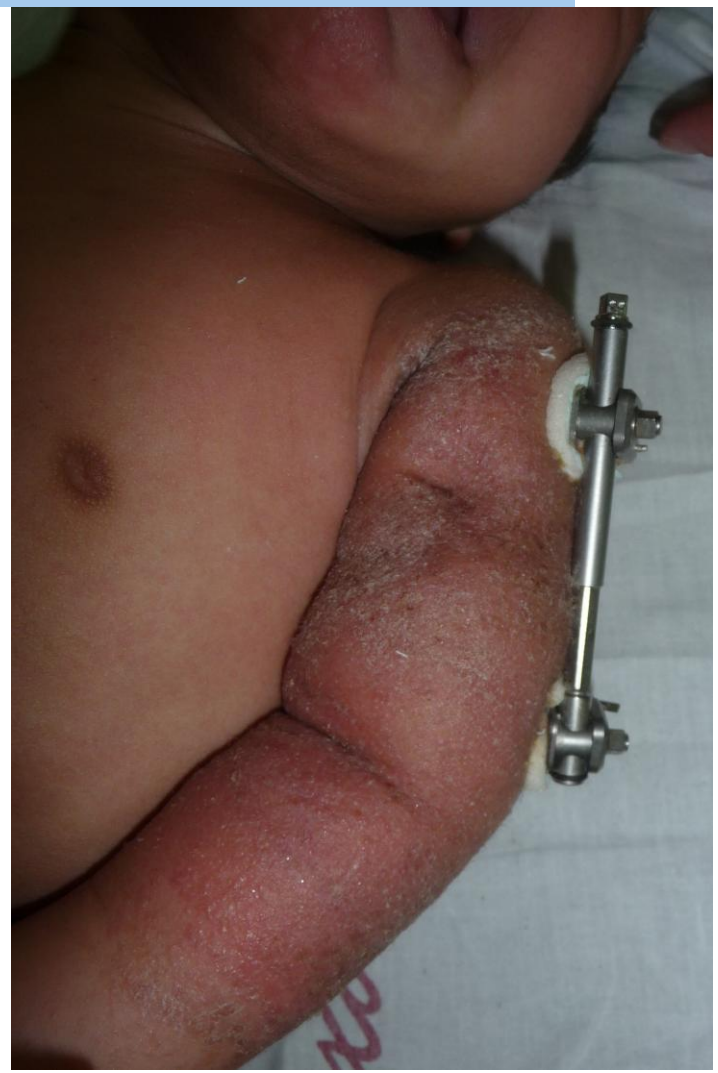
EVOLUZIONE IN 4 MESI A PSEUDO ATROFICO; GIÀ ASETTICO, NELLA SCINTIGRAFIA.



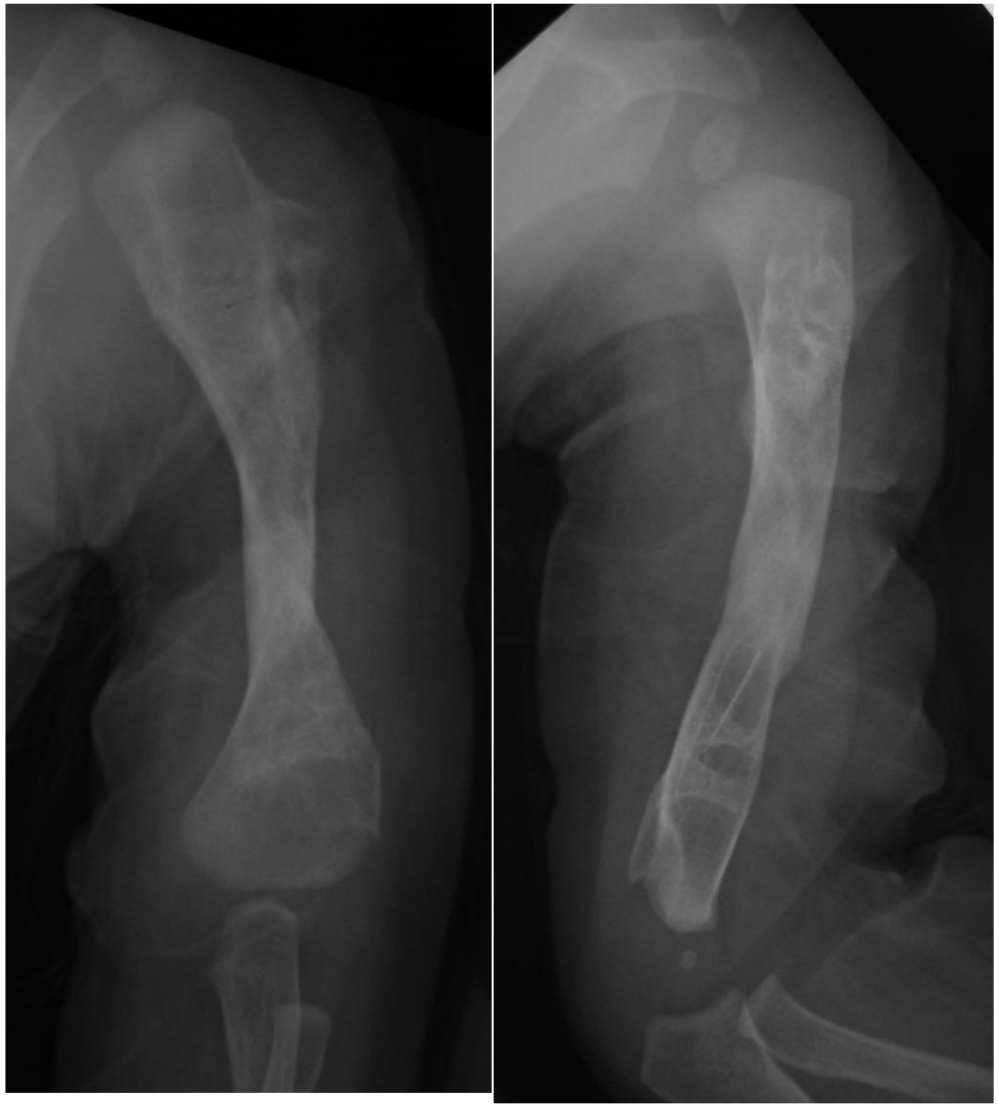
CHIRURGIA CON INNESTO AUTOLOGO DI CRESTA OMOLATERALE.
STABILIZZAZIONE CON CAMBIO SPINOTTO PROSSIMALE E MICROELONGATOR-COMPRESSORE.
EVOLUZIONE VERSO IL CONSOLIDAMENTO IN 2 MESI.

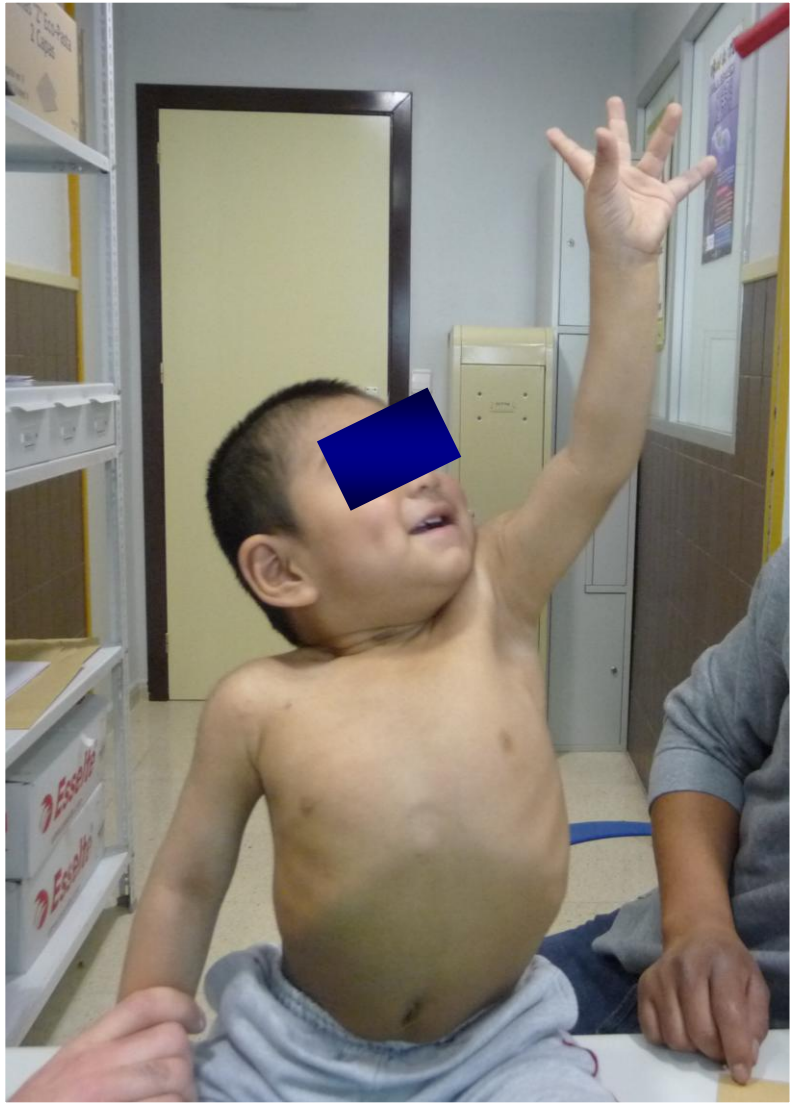


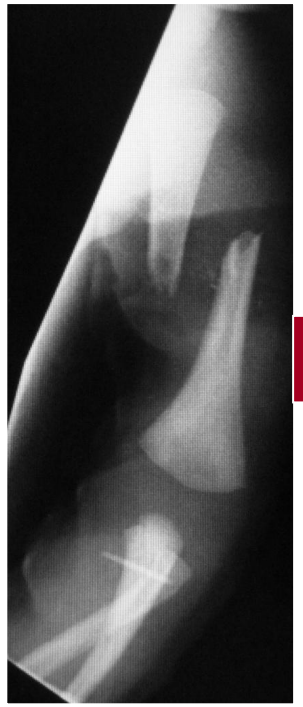


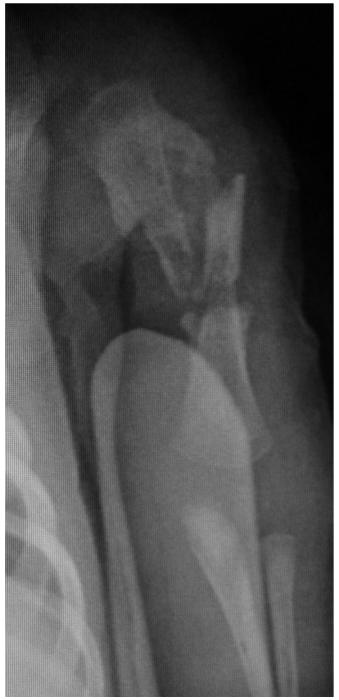


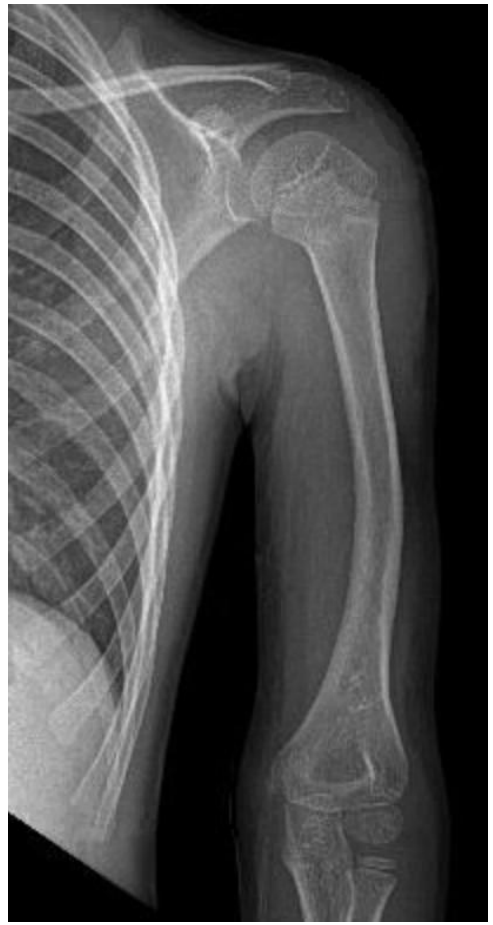
CURA RADIOGRAFICA E CLINICA COMPLETA.



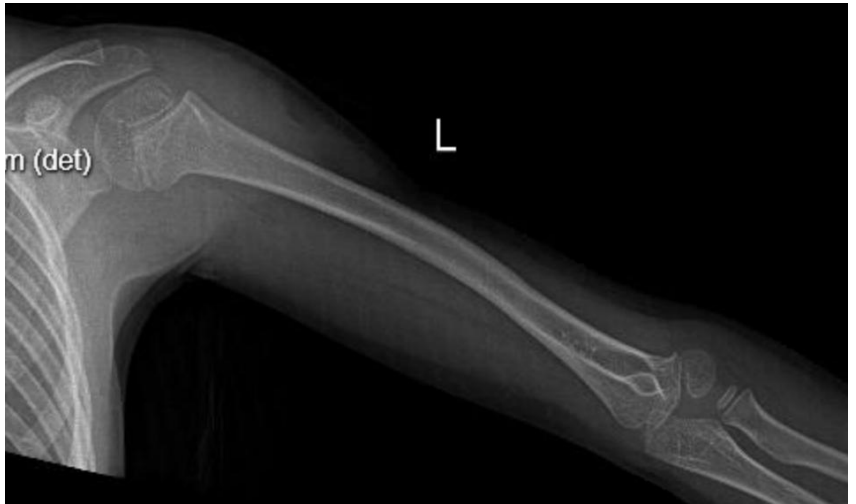








RADIOGRAFIA ATTUALE



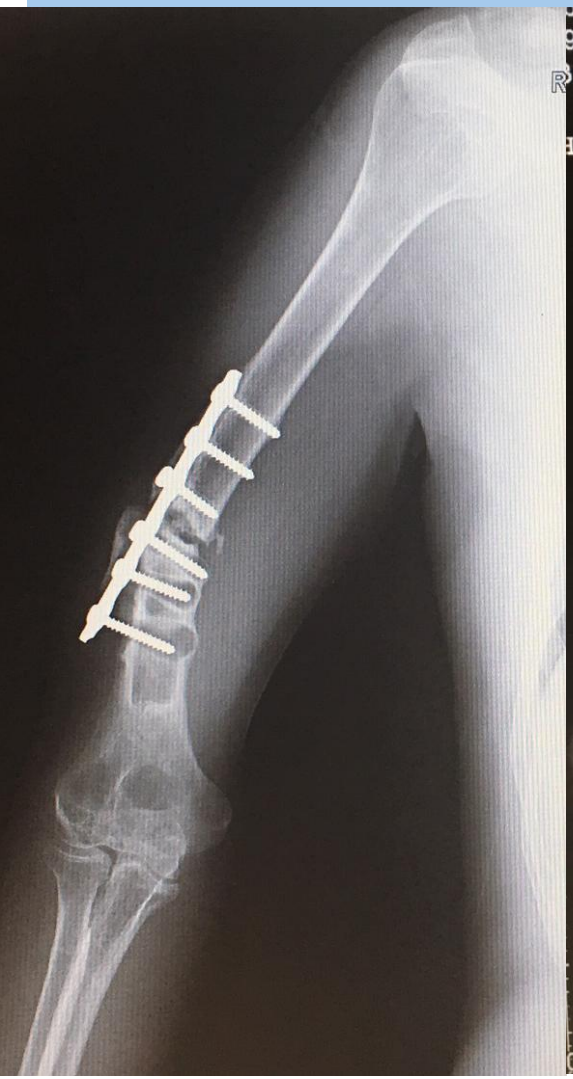
ATTRONICO MOBILE/ OLIGOTROFICO

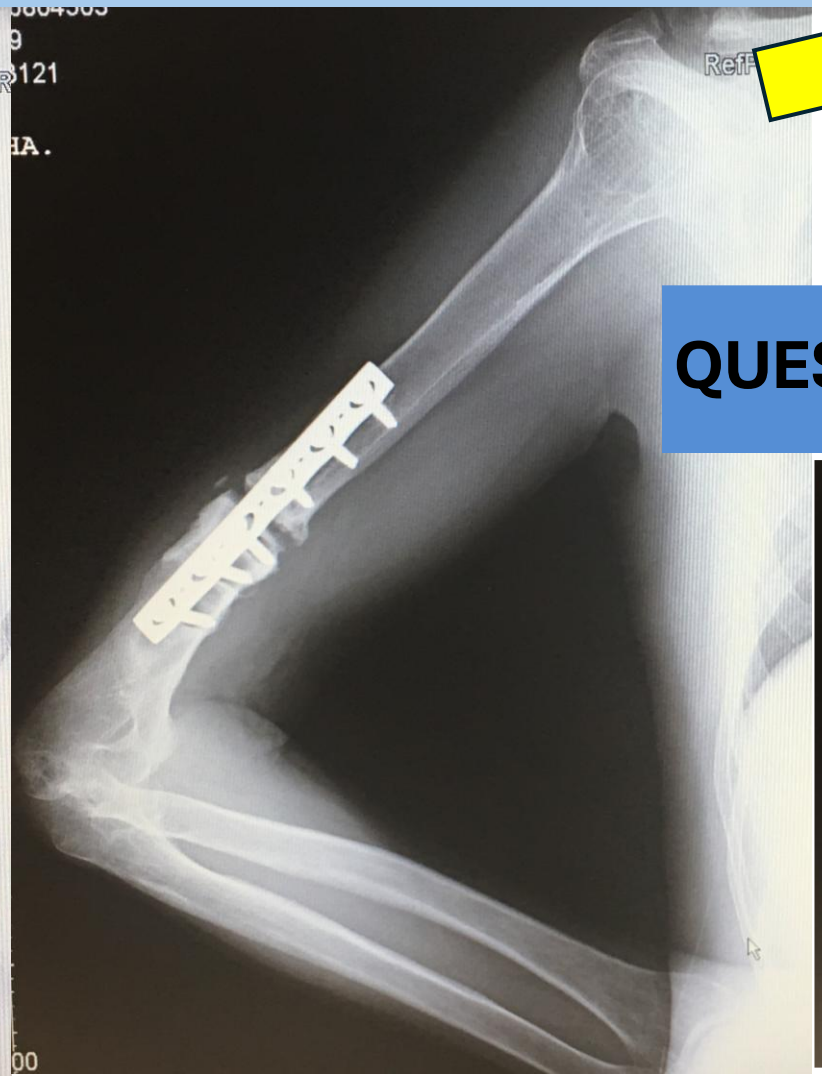
CORREZIONE MECCANICA, STABILIZZAZION
E CON EF
TOLOGO

PSEUDOA SI ATROFICA
DIAFI DELL'OMERO DOPO
HIA, RAFE CON PLACCA...
(10 A DI EVOLUZIONE)
MASCHIO 37 A

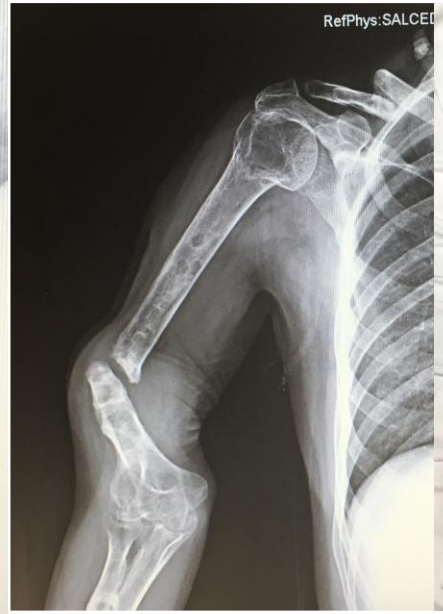
L'ACCORCIAMENTO NON È COSÌ IMPORTANTE NEGLI MMSS

DOPO QX CON UNGHIA: EMO DA PSEUDO E INTOLLERANZA ALLA PLACCA

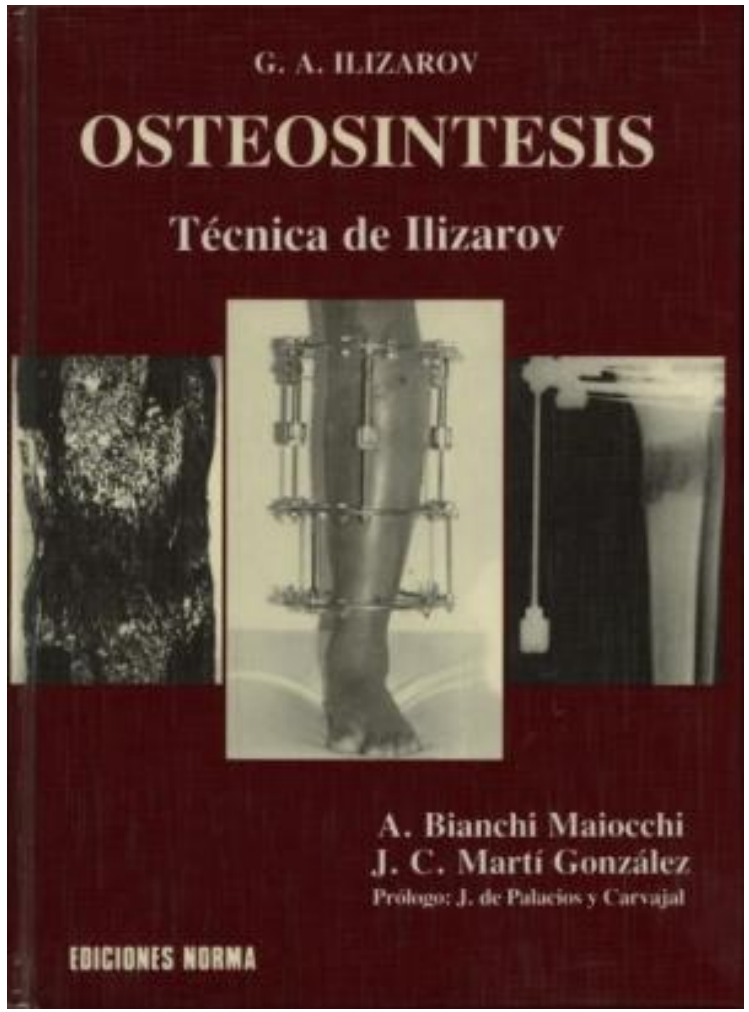


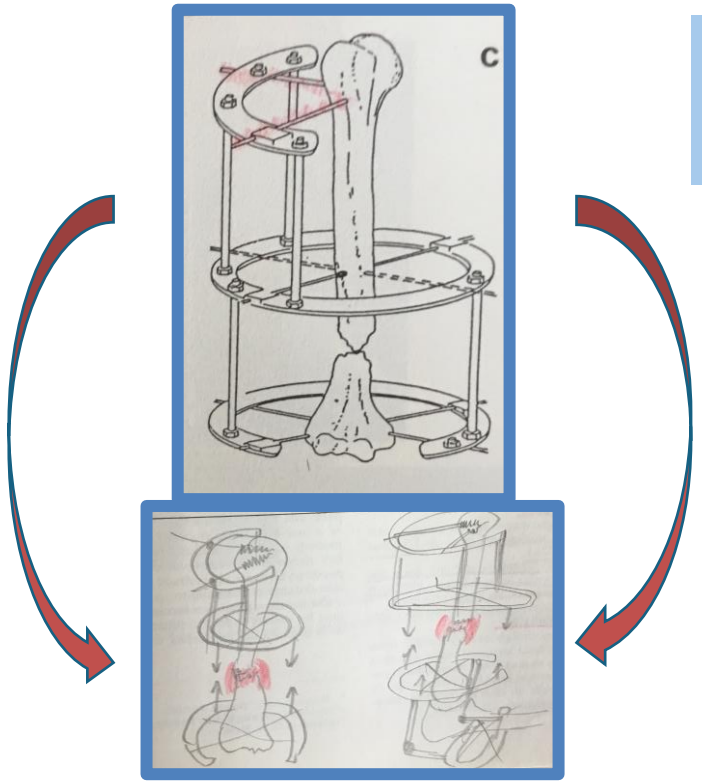


QUESTA ERA LA SITUAZIONE...

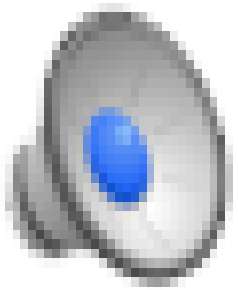


COSA FARE?

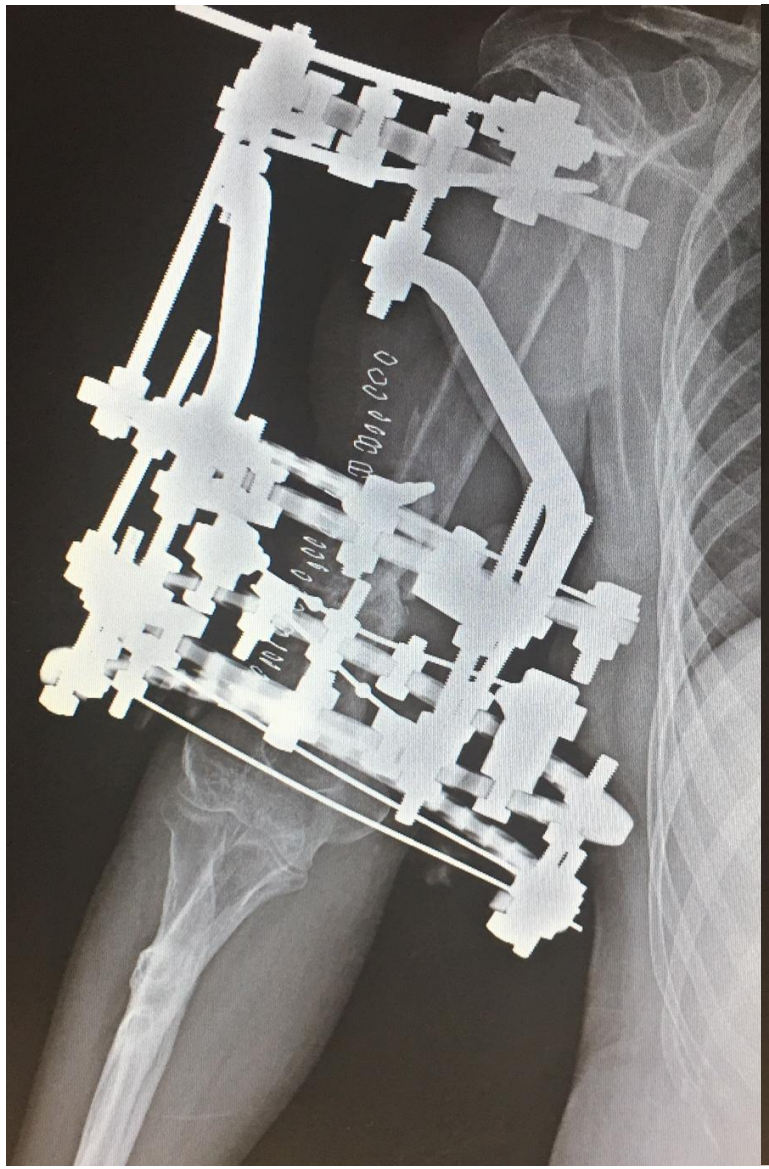


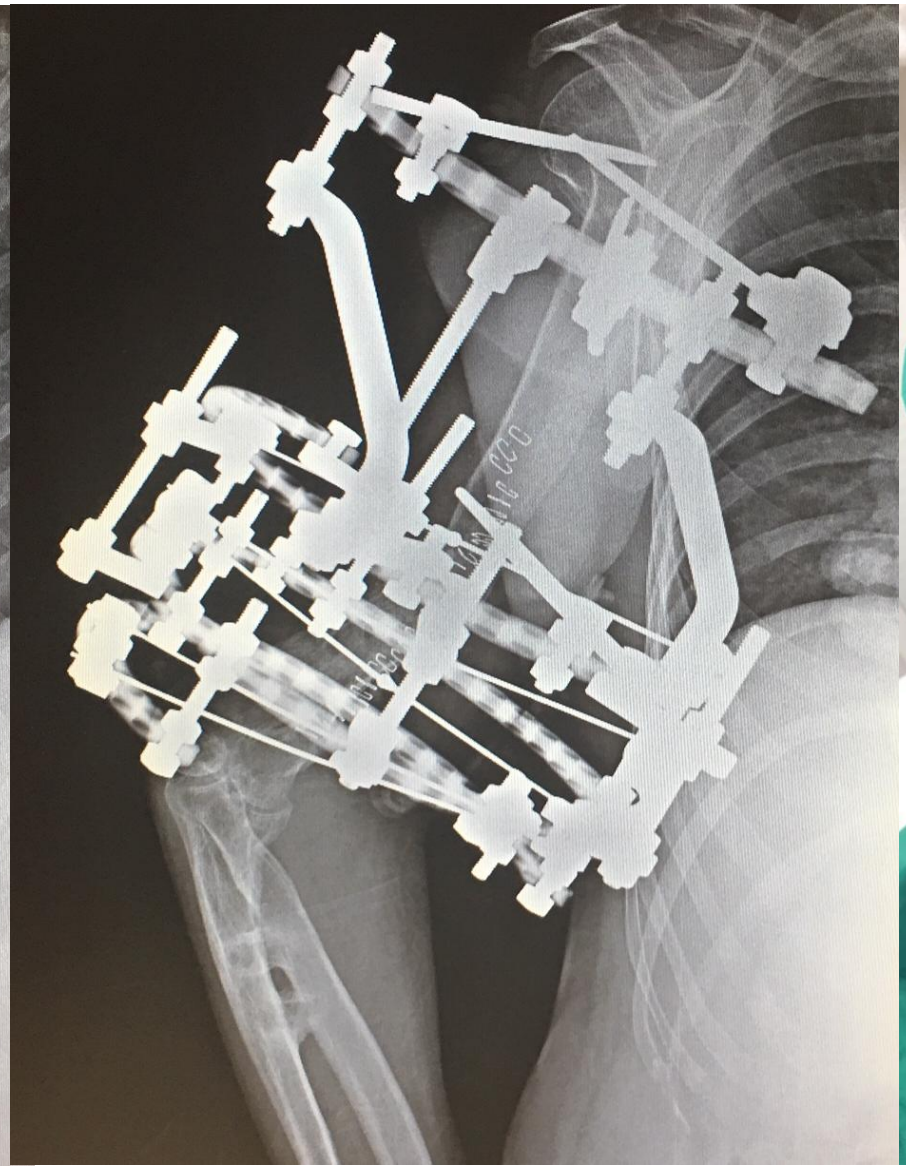


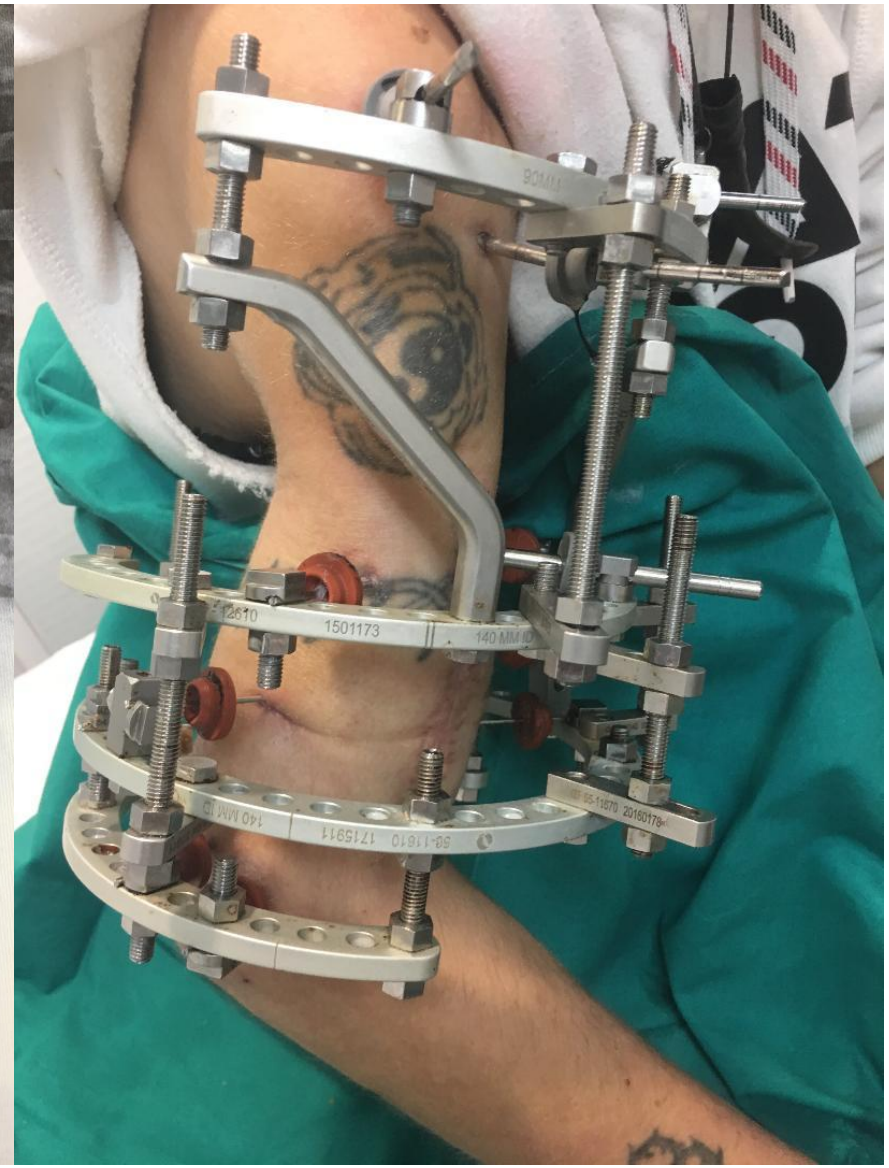
TECNICA DI INNESTO INCORPORATO CHUTRO-PHEMISTER



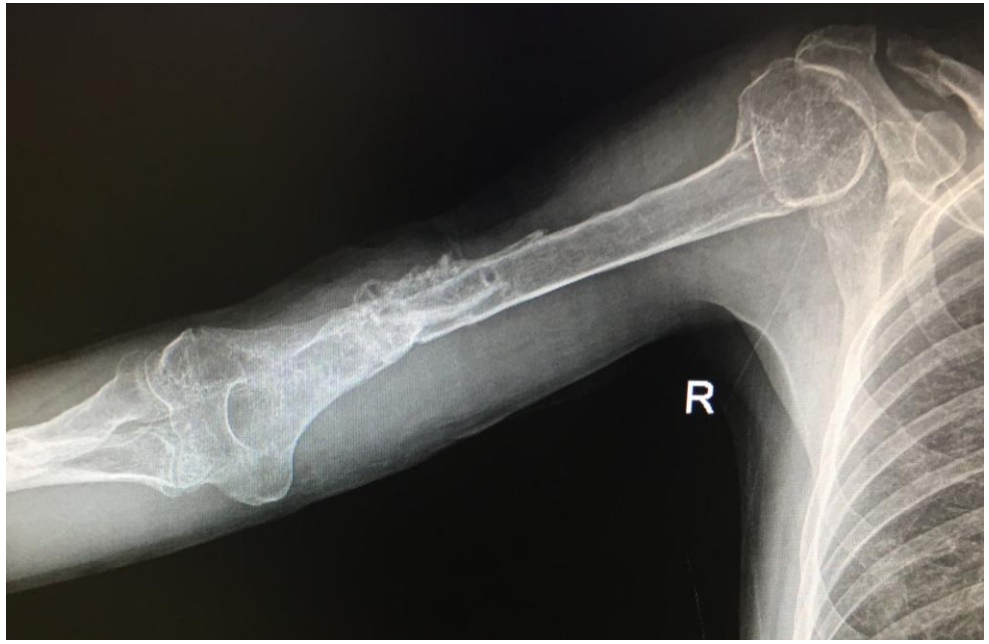
COMPRESSIONE CIRCOLARE FEXT RICOSTRUZIONE

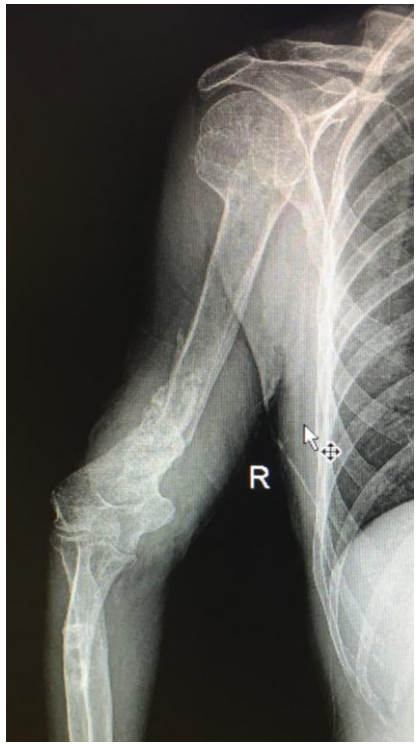




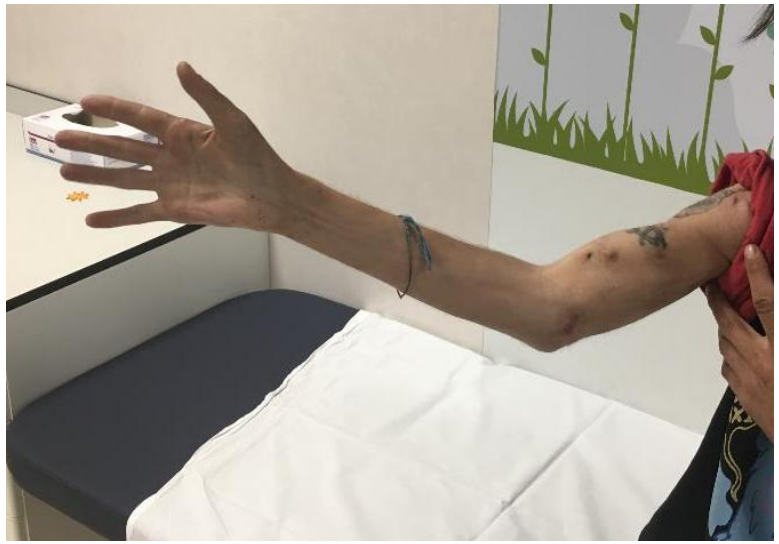


NON HA SMESSO DI LAVORARE...

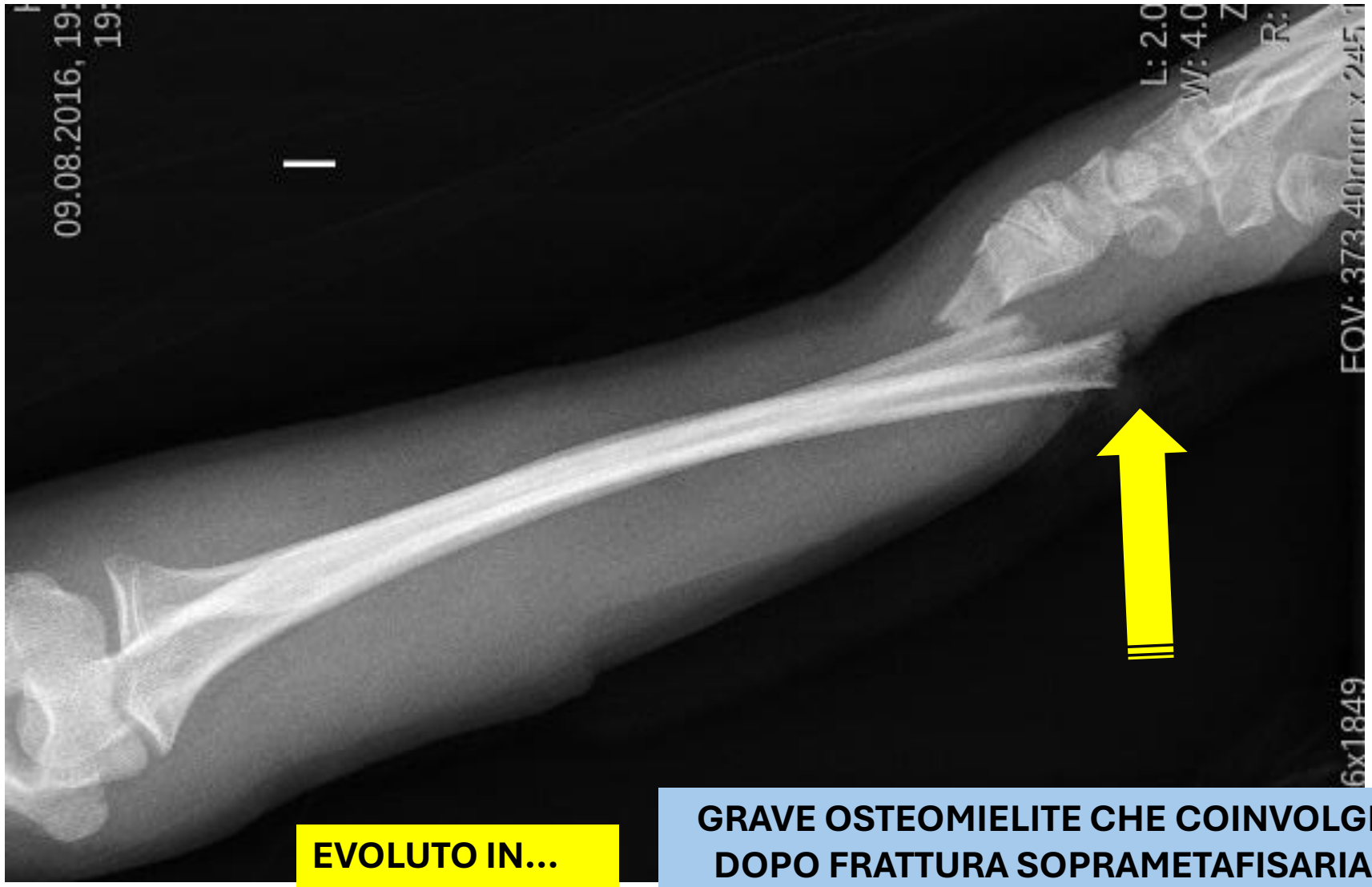




GUARIGIONE COMPLETA A 6 MESI

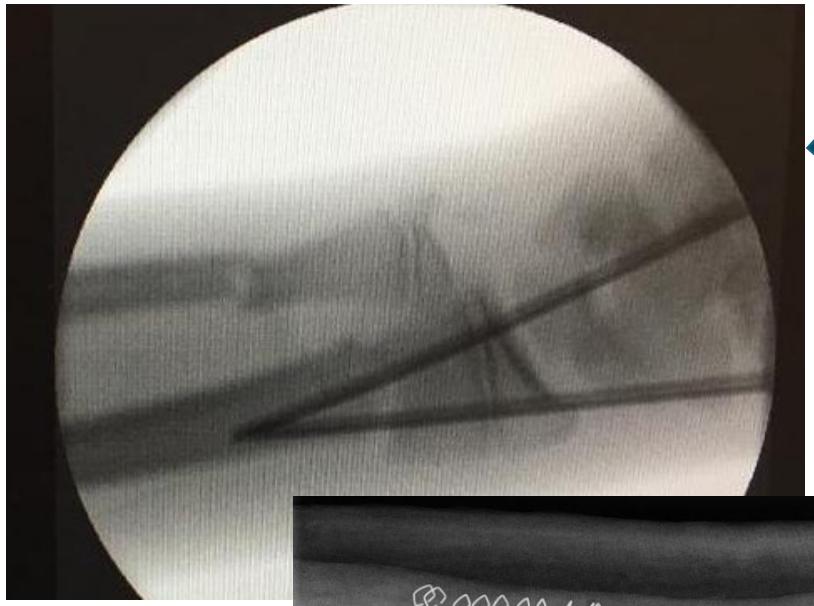


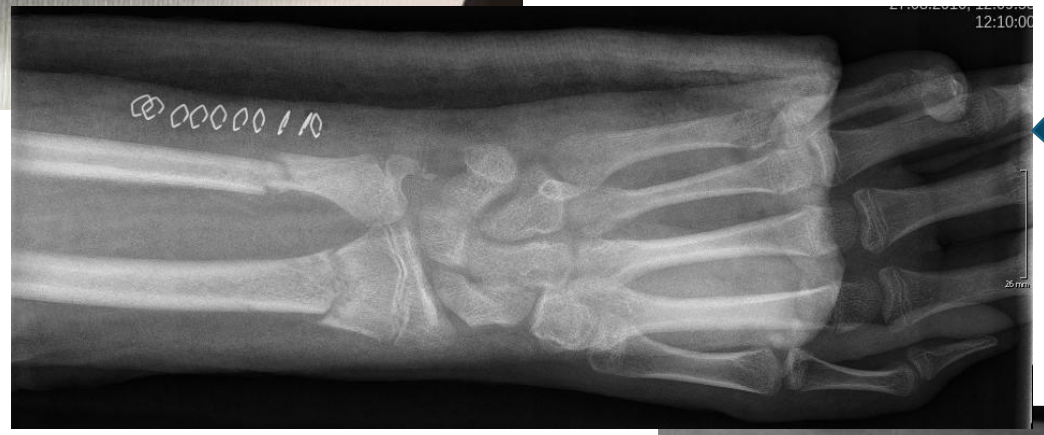
RAGAZZO DI 14 ANNI.
FX ABIERTA G I DE EDR-C IZDA

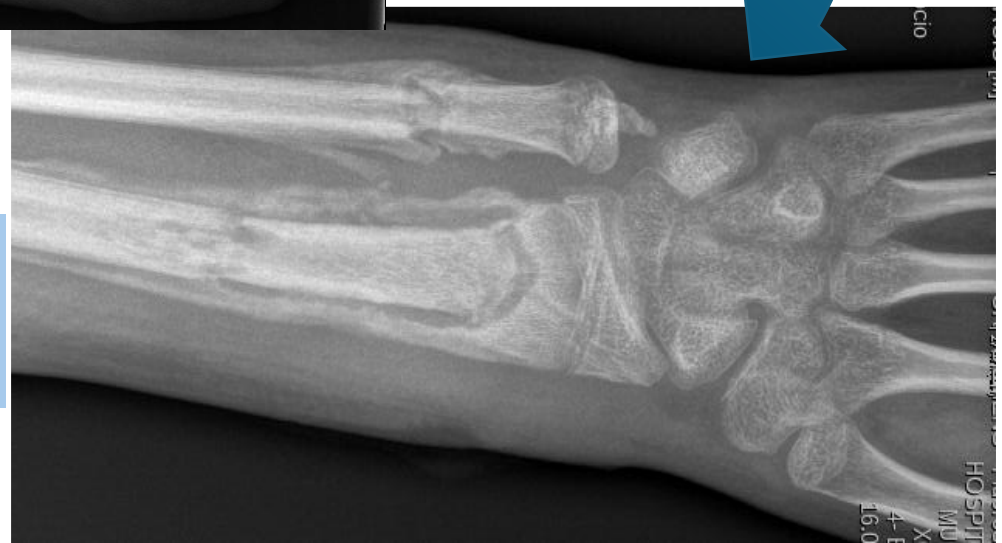


EVOLUTO IN...

GRAVE OSTEOMIELITE CHE COINVOLGE DOPO FRATTURA SOPRAMETAFISARIA APERTA DEL RADIO.



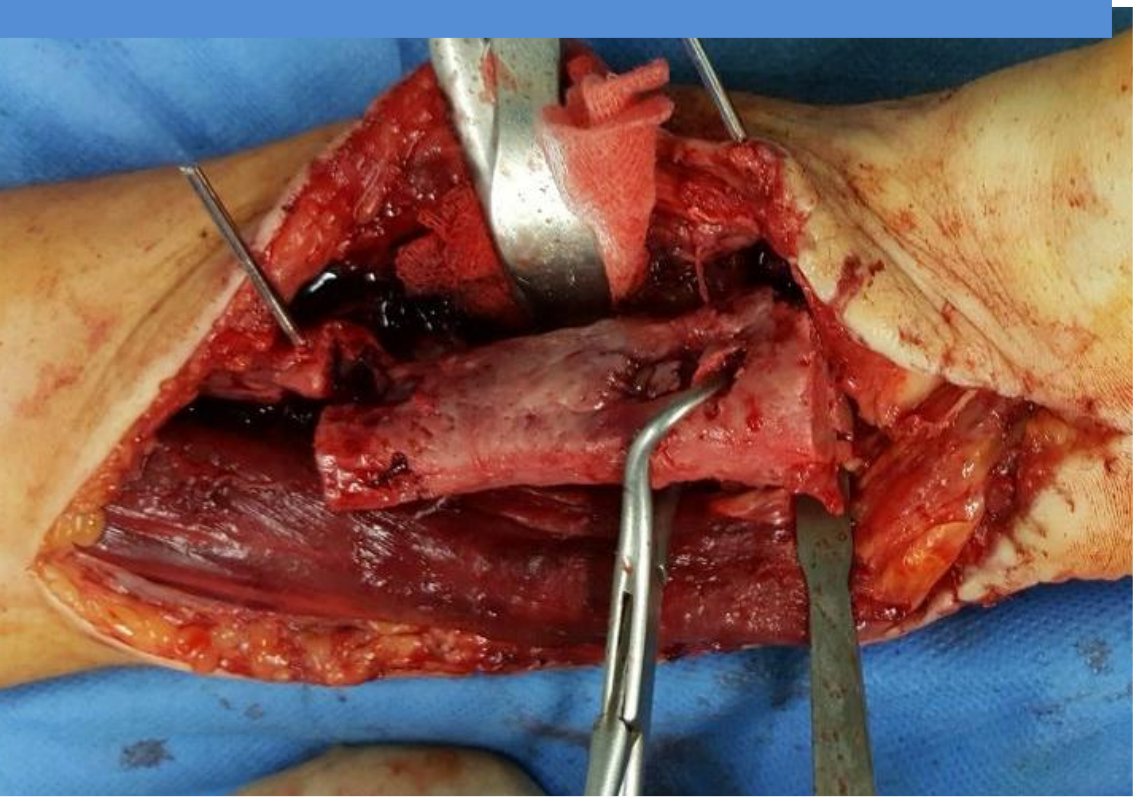


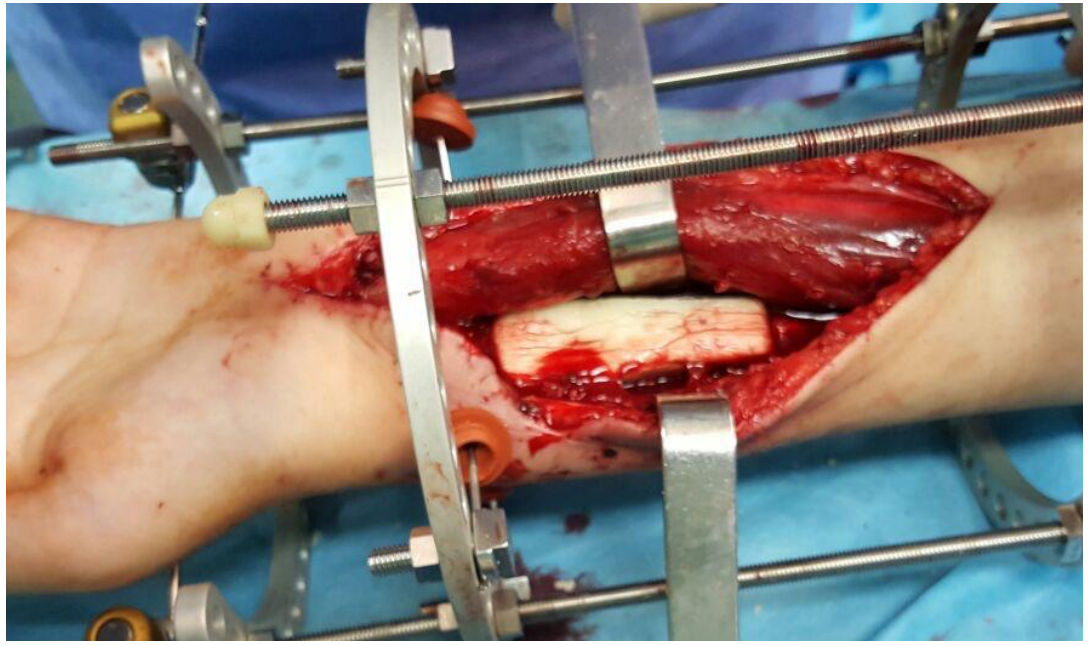


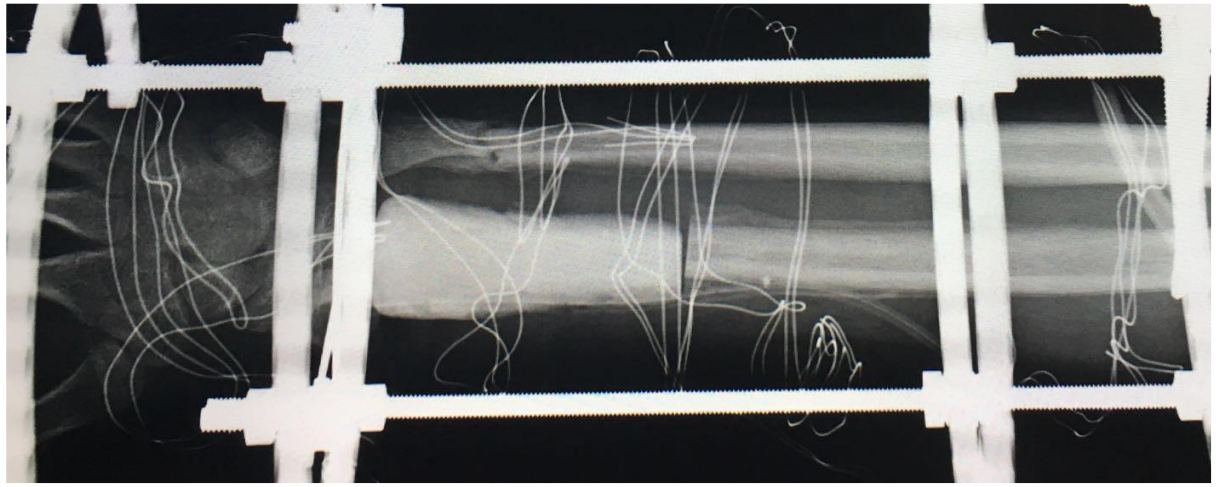
TTO CON LAVAGGIO E RIDUZIONE AK
INFEZIONE A 2 SETTIMANE. EMO
ESORDIO DI OM GRAVE CON COINVOLGIMENTO

AL PRONTO SOCCORSO È STATO
TRATTATO IN MODO "RADICALE"

1° TEMPO RICOSTRUTTIVO



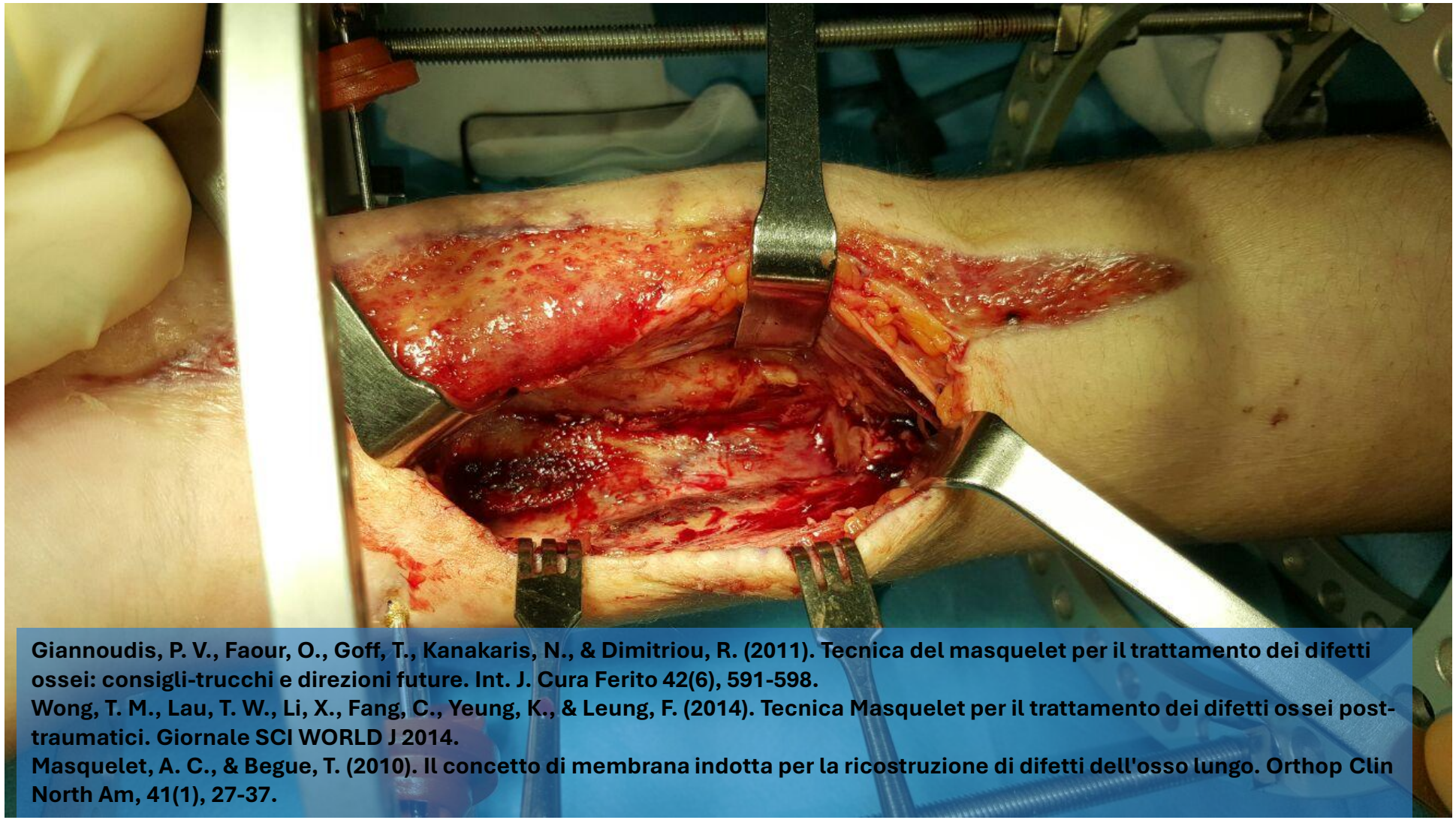




CEMENTO CIRCOLARE + DISTANZIATORE
ATB AD AMPIO SPETTRO

CHIRURGIA PROGRAMMATA… MA CON LO STESSO FISSATORE ESTERNO IN POSIZIONE SERVIZI DI EMERGENZA

2° TEMPO RICOSTRUTTIVO



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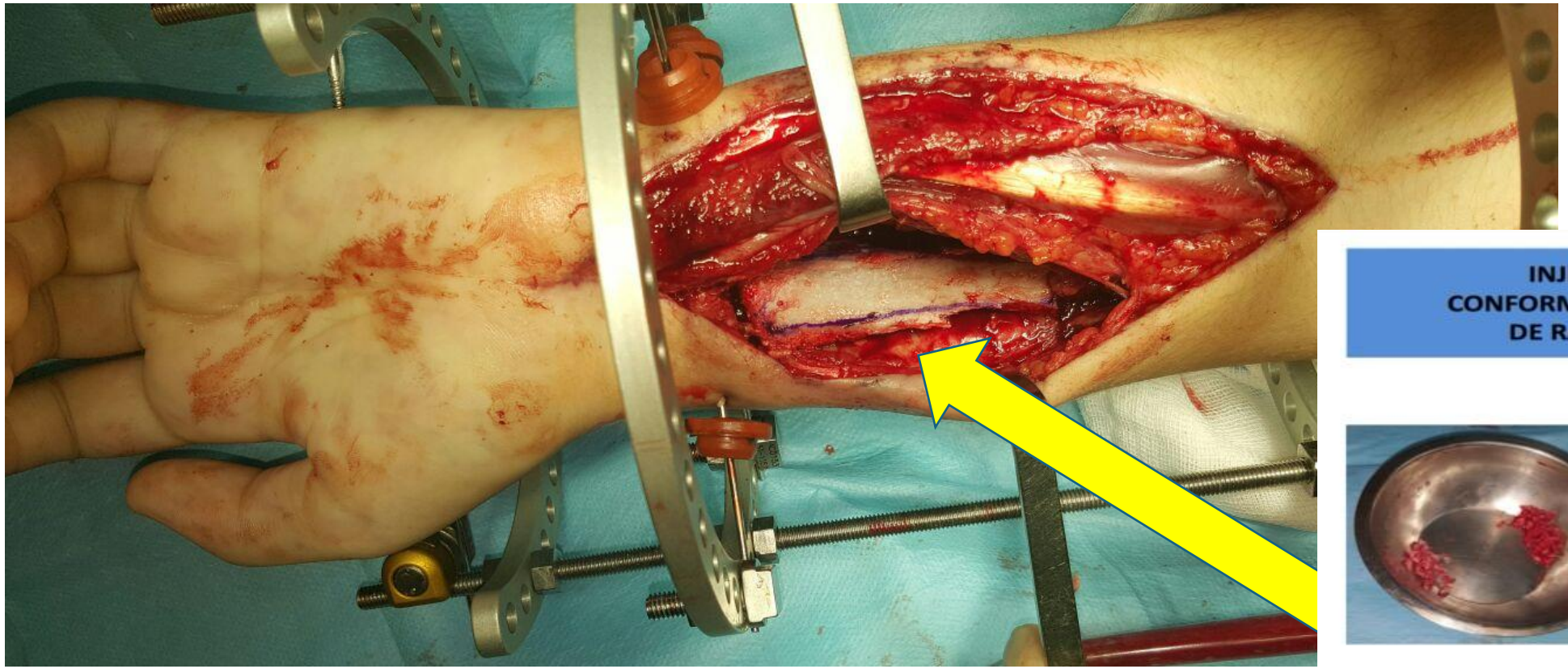
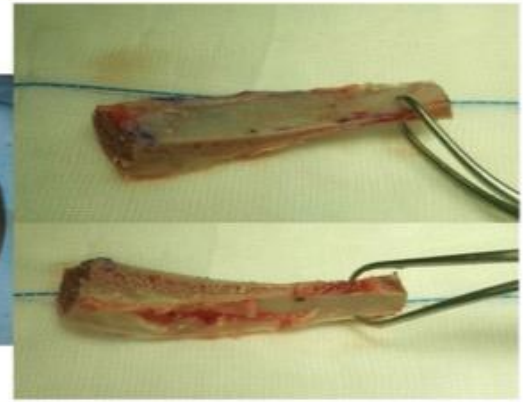
Wong, T. M., Lau, T. W., Li, X., Fang, C., Yeung, K., & Leung, F. (2014). Tecnica Masquelet per il trattamento dei difetti ossei post-traumatici. Giornale SCI WORLD J 2014.

Masquelet, A. C., & Begue, T. (2010). Il concetto di membrana indotta per la ricostruzione di difetti dell'osso lungo. Orthop Clin North Am, 41(1), 27-37.

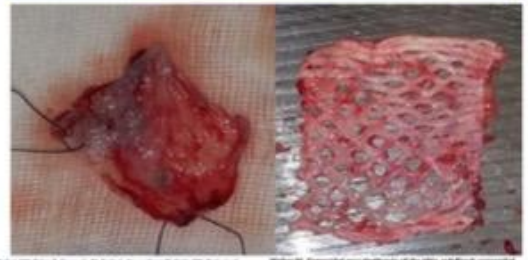
INNESTO DI CRESTA DI FORMA AUTOLOGA



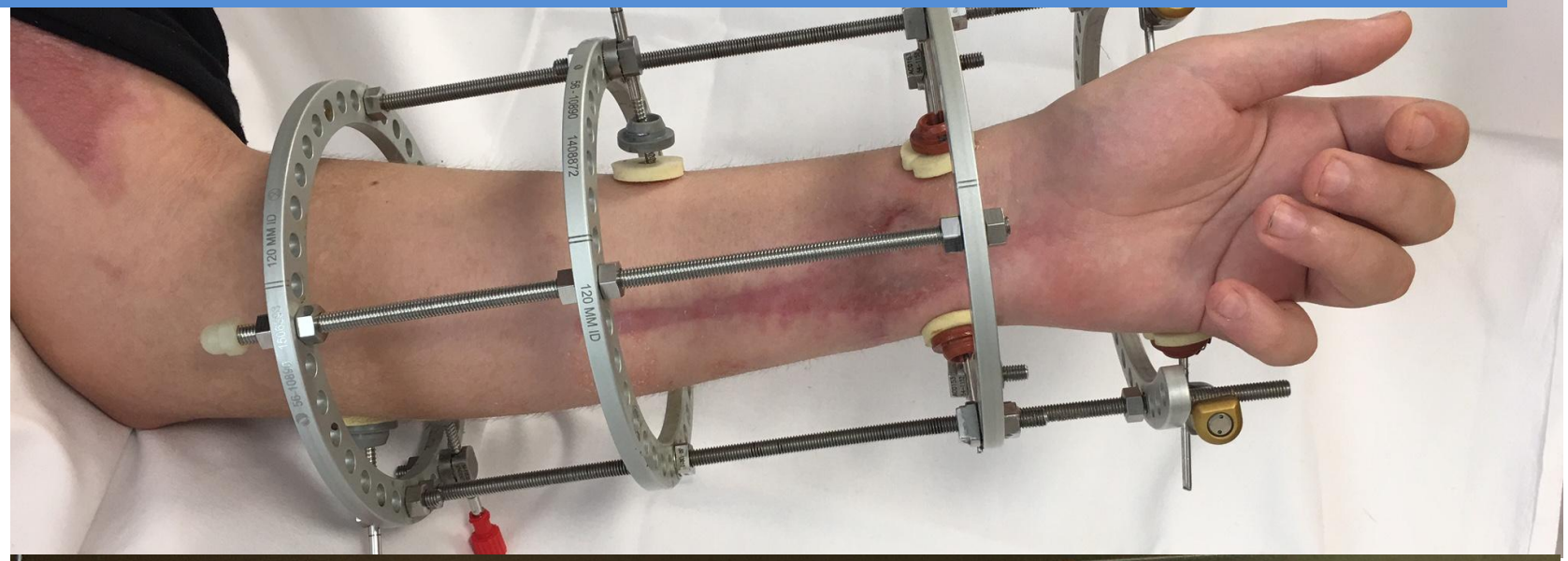
INJERTO DE CRESTA ILÍACA:
CONFORMACIÓN DE ZONA ANATÓMICA
DE RADIO DISTAL Y PROXIMAL

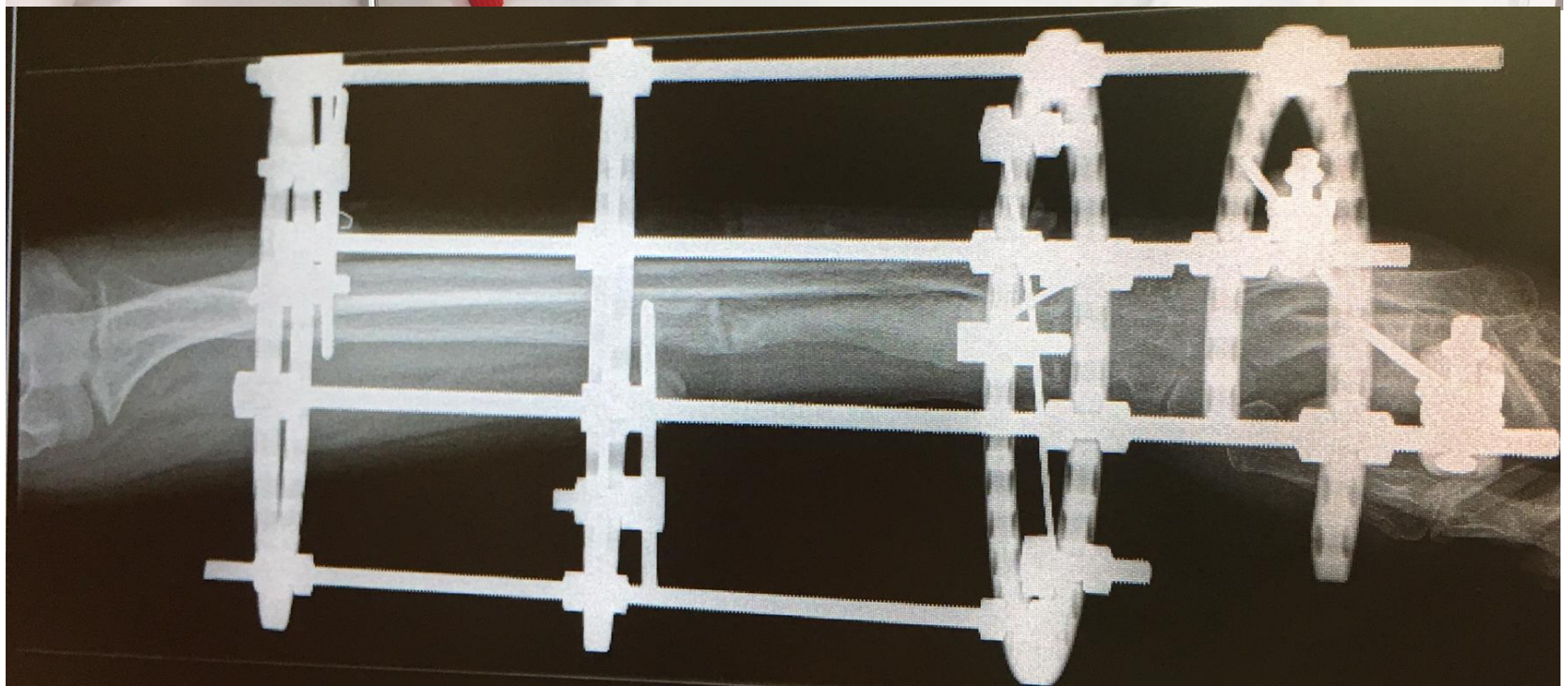


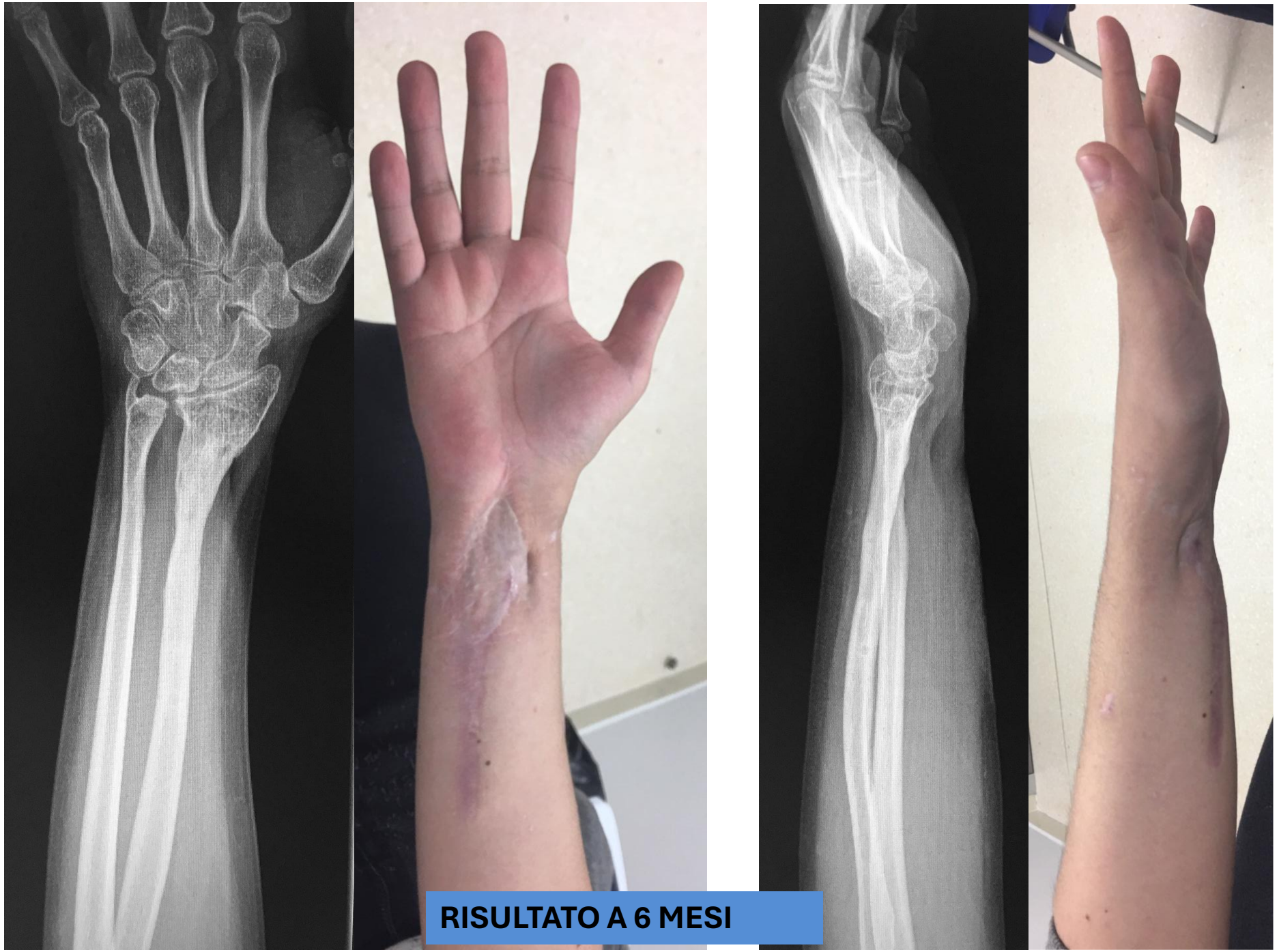
INJERTO DE PERIOSTIO MALLADO
DE LA TABLA INTERNA ILÍACA



BUONA EVOLUZIONE CLINICA E RADIOGRAFIA

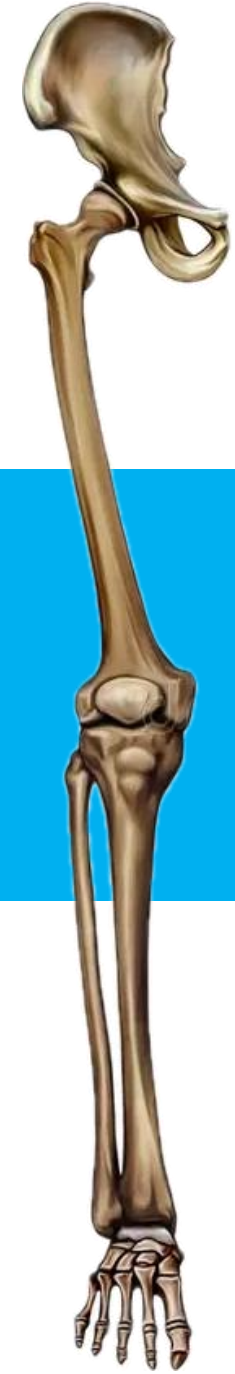






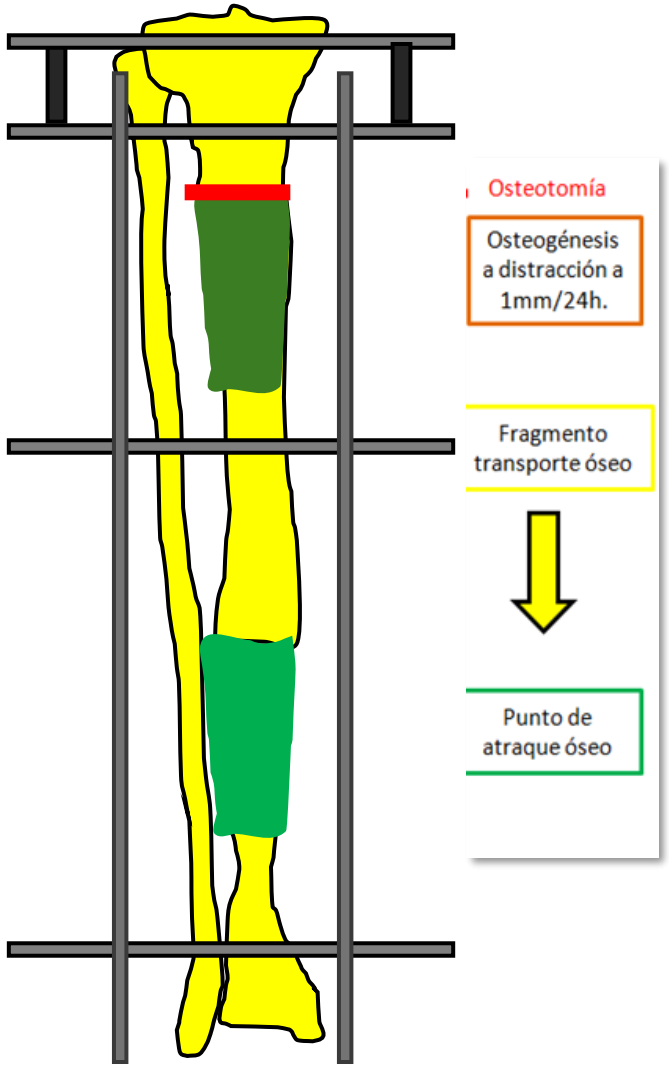
RISULTATO A 6 MESI

ARTI INFERIORI



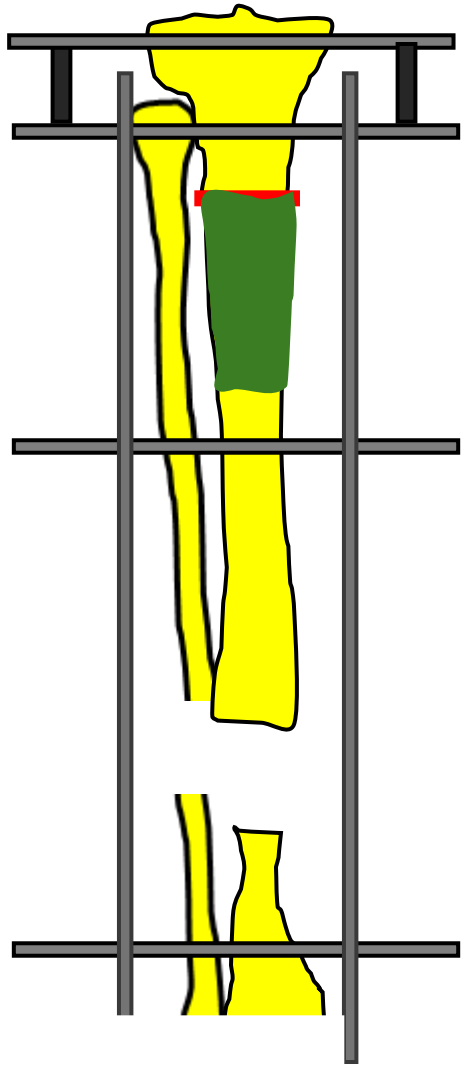
Trasporto osseo

ELIMINIAMO IL DIFETTO OSSEO MEDIANTE LA TRASLAZIONE DI UN SEGMENTO OSTEOTOMIZZATO.



Accorciamento-allungamento

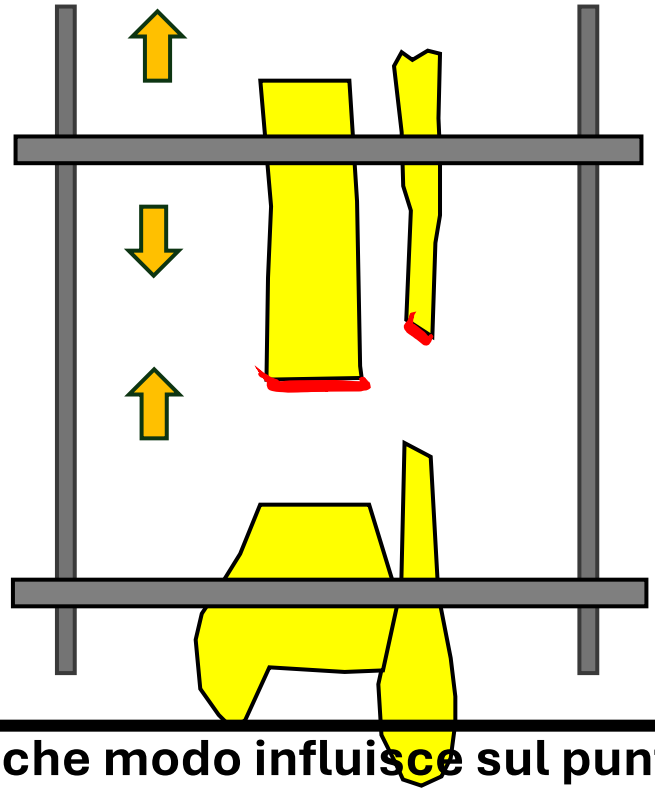
ELIMINIAMO IL DIFETTO ACCORCIANDO I SEGMENTI E POI ALLUNGANDOLI.



ACCORCIAMENTO -ALLUNGAMENTO

INDICAZIONE

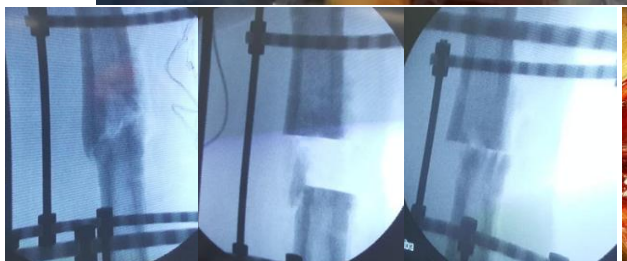
Difetti < 3-5 cm
Nessuna integrità del perone

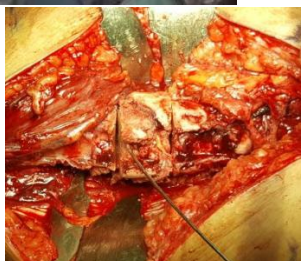


In che modo influisce sul punto di attracco?

"Evitiamo" un Punto di Attracco

LIMITAZIONE:
P. Coinvolgimento molle e arterovenoso.





RESEARCH ARTICLE

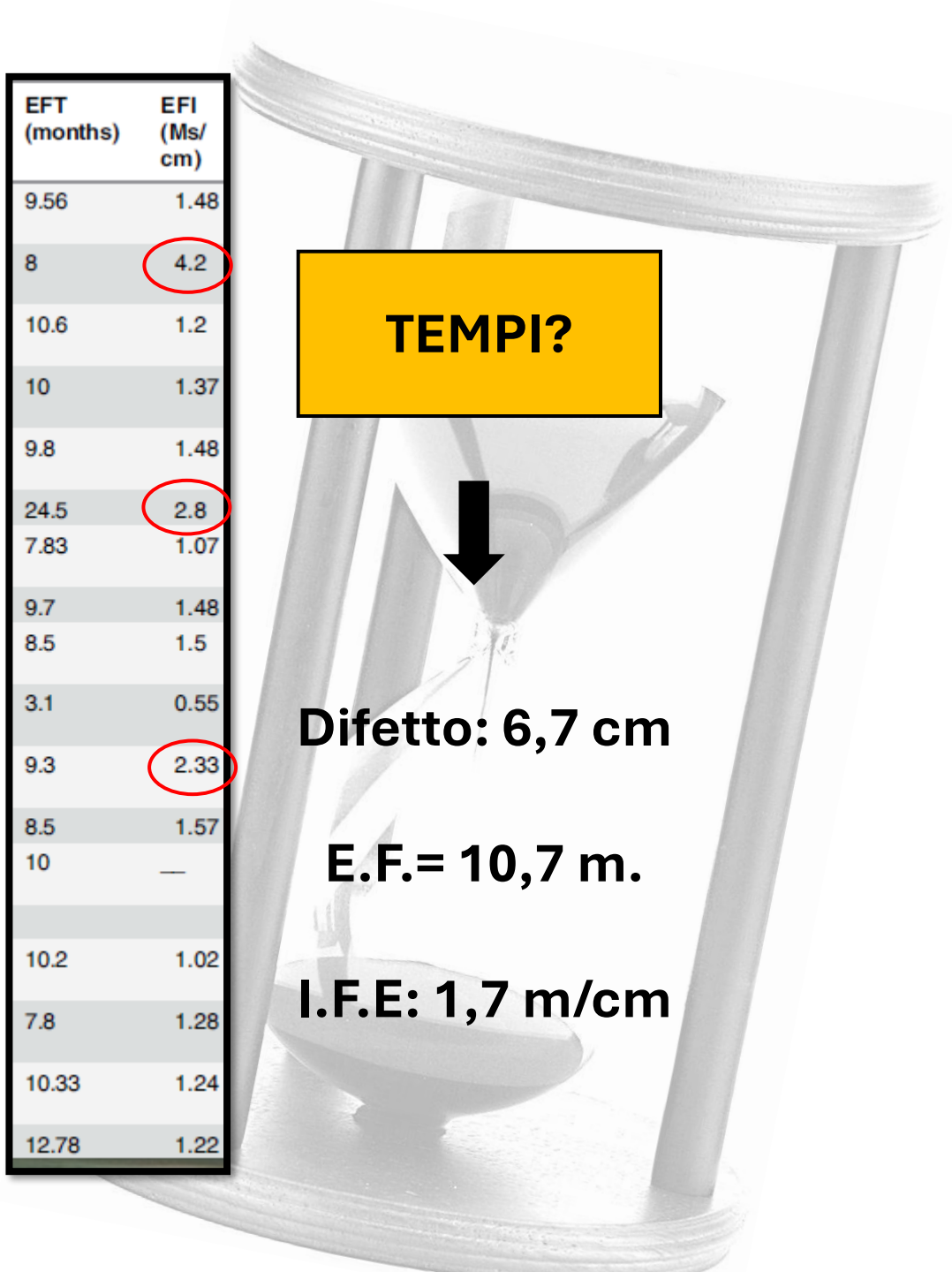
A Systematic Review and Meta-Analysis of Ilizarov Methods in the Treatment of Infected Nonunion of Tibia and Femur

Peng Yin[1,2☯], Qiunan Ji[3☯], Tongtong Li[1,2☯], Jiantao Li[1], Zhirui Li[1], Jianheng Liu[1], Guoqi Wang[1], Song Wang[1,2], Lihai Zhang[1]*, Zhi Mao[1]*, Peifu Tang[1]*

infected femur nonunion. The patients had an average of 3.64 previous surgical procedures before receiving the treatment of Ilizarov method[1,7,8,10,12–15,17–21,23,24,27,29–31]; the mean previous surgical procedures was 3.84 in patients with infected tibia nonunion and 3.81 in patients with infected femur nonunion. The mean bone defects was 6.70 cm in the patients [1,7,8,10–15,17–25,27–31], and 6.54 cm in patients with infected tibia nonunion and 8.05 cm in patients with infected femur nonunion. The mean length of follow-up was 39.79 months in the patients[1,7,8,10–14,17–24,26–31], and 32.49 months in patients with infected tibia non-

The average of bone union rate was 97.26% in all included studies, and 97.50% in the studies of infected tibia nonunion and 97.59% in the studies of infected femur nonunion. The mean complications of every patient were 1.36 in all patients, and 1.23 in patients with infected tibia nonunion and 2.24 in patients with infected femur nonunion. The mean external fixation time was 10.69 months in the patients[1,7,8,10–14,17–28,30,31], and 9.41 months in patients with infected tibia nonunion and 18.26 months in patients with infected femur nonunion. The mean external fixation index was 1.70 months/cm in the patients[1,7,8,10,13,14,17–24,26–28,31], and 1.64 months/cm in patients with infected tibia nonunion and 2.19 months/cm in patients with infected femur nonunion. Further details were listed in Table 2.

EFT (months)	EFI (Ms/cm)
9.56	1.48
8	4.2
10.6	1.2
10	1.37
9.8	1.48
24.5	2.8
7.83	1.07
9.7	1.48
8.5	1.5
3.1	0.55
9.3	2.33
8.5	1.57
10	—
10.2	1.02
7.8	1.28
10.33	1.24
12.78	1.22



TEMPI?

Difetto: 6,7 cm

E.F.= 10,7 m.

I.F.E: 1,7 m/cm

European Journal of Orthopaedic Surgery & Traumatology
https://doi.org/10.1007/s00590-020-02862-5

ORIGINAL ARTICLE

Infected bone defects in the lower limb. Management by means of a two-stage distraction osteogenesis protocol

César Salcedo Cánovas[1,2] · Javier Martínez Ros[1,2] · Antonio Ondoño Navarro[3] · José Molina González[1,2] · Alicia Hernández Torres[2,4] · Encarnación Moral Escudero[2,4] · Manuel Medina Quirós[3]

Revisione del punto di aggancio dopo la compressione semplice

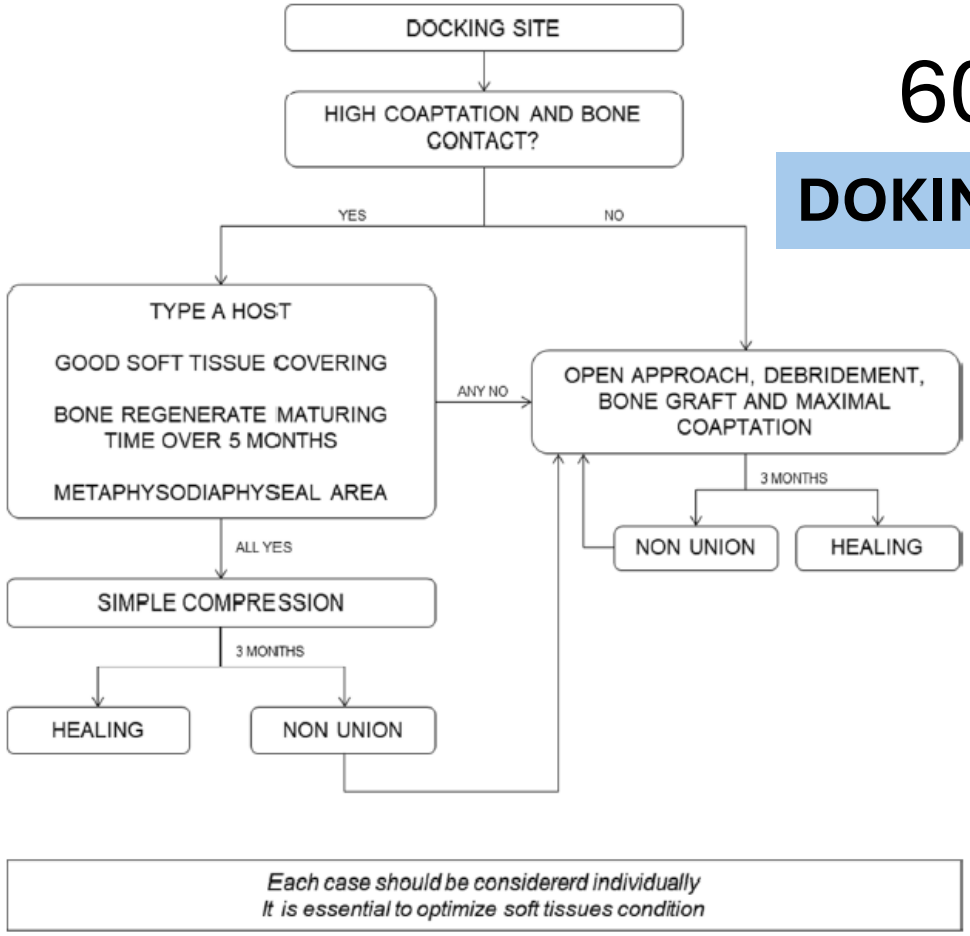
Table 5 Compared results

	HCUVA
Number of patients	35
Male/female ratio	30/5 (0.86)
Age (years)	40.06 (95%
Follow-up (months)	45,31 (95%
Previous surgeries	4.14 (95% (
External fixation index (months/cm)	2.37
External fixation time (months)	16.69
Bone graft in docking site (%)	60
Defect size (cm)	8.40 (95% (
Screw infection (infection/patient)	0.285

Complications of type B, requiring modification or removal of screws, occurred in 11% of patients.

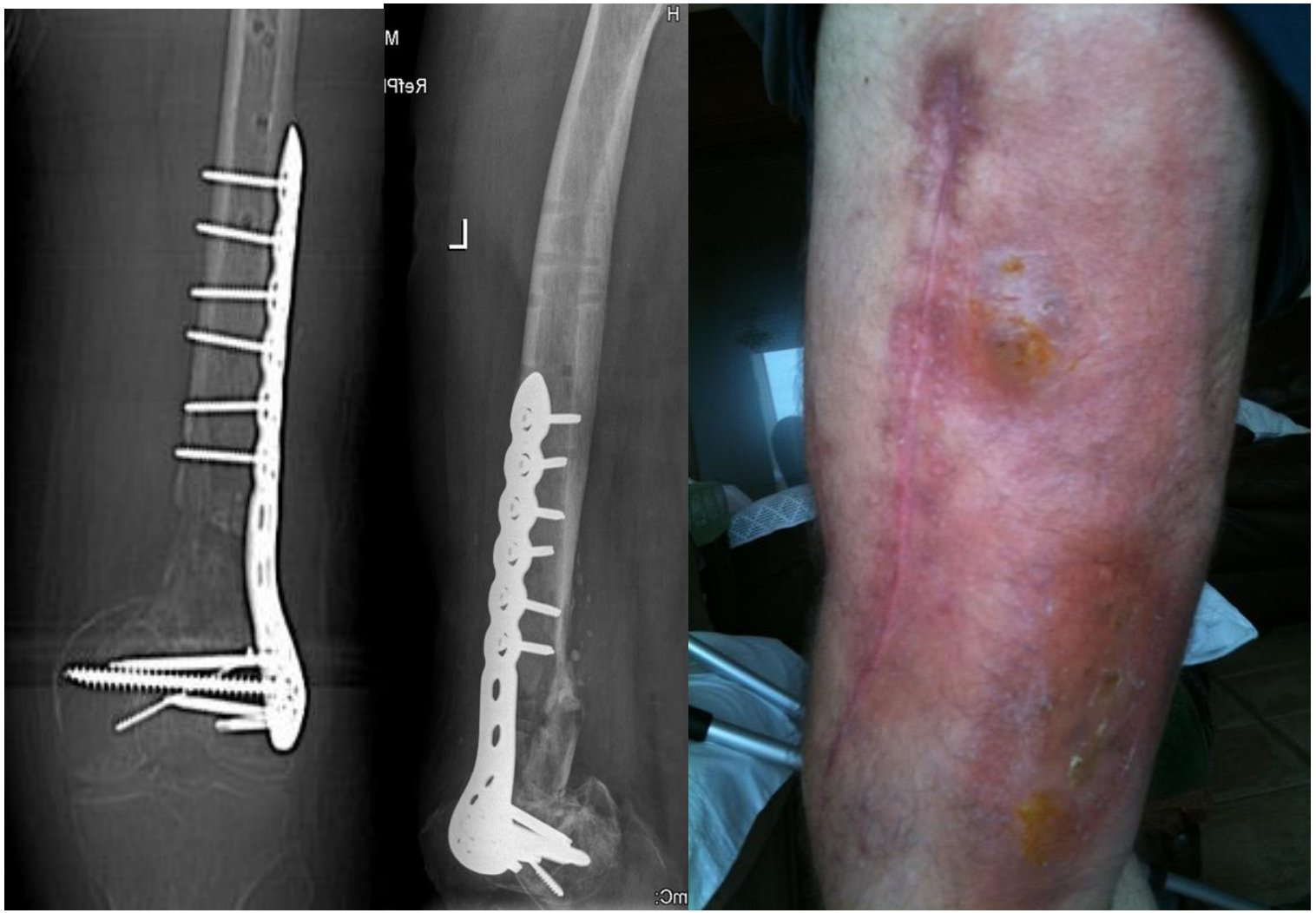
The non-union of the docking point "per primam" was presented in 21 (60%) patients who required debridement and graft delivery. However, we must take into account that in the last 8 patients of the series, the docking point was systematically protocolized. But if we just consider the 27 patients that were treated following our old protocol, only 13 (48.15%) of them developed problems in the docking site.

No patients had to be re-operated for any other reason.



60%

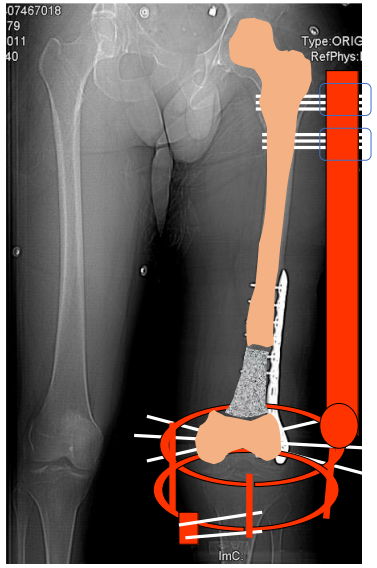
DOKING SITE



TRASPORTO OSSEO

IN QUALI PROCESSI UTILIZZIAMO L'OSTEOGENESI DA DISTRAZIONE?

GRAVE PSEUDOARTROSI SETTICA DEL FEMORE DOPO FRATTURA APERTA TRATTATA CON OSTEOSINTESI INTERNA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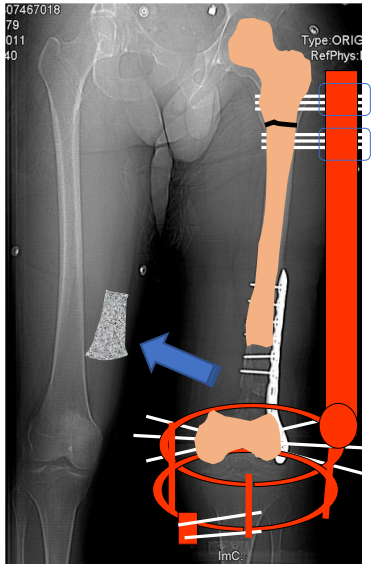
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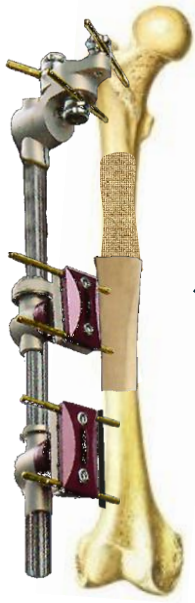

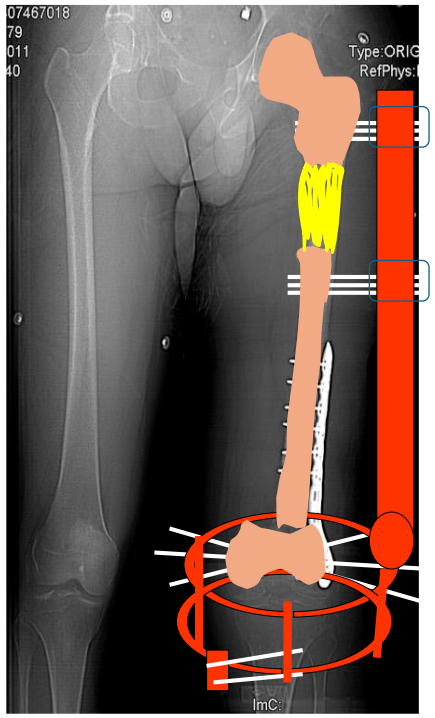
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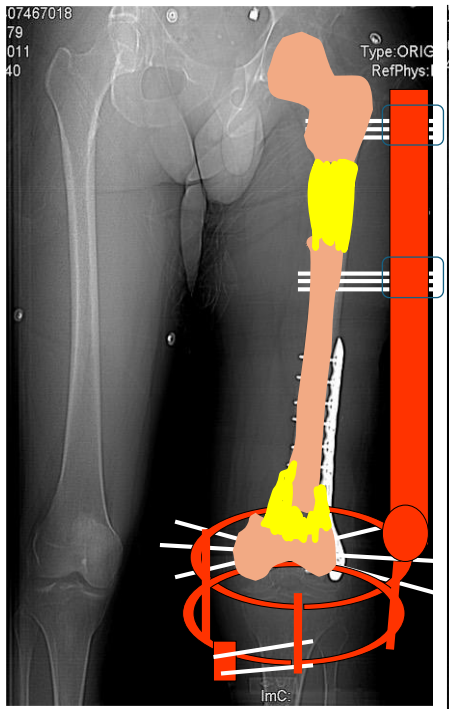
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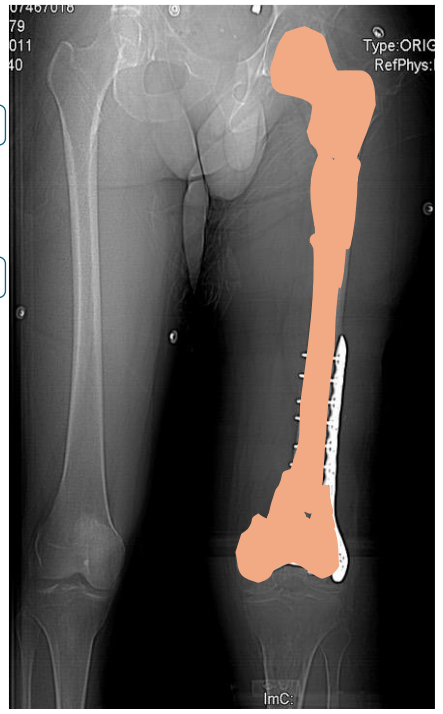
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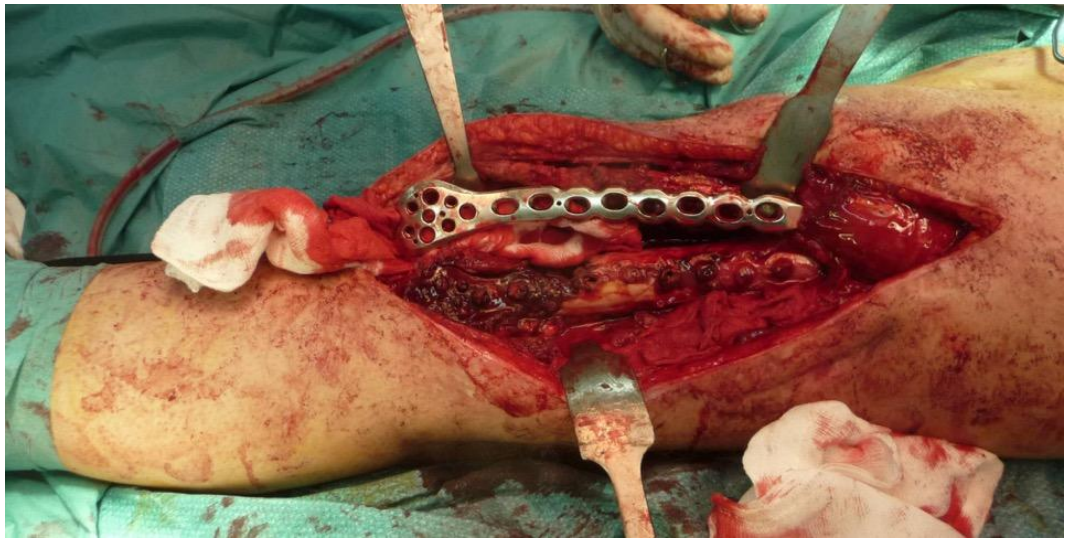
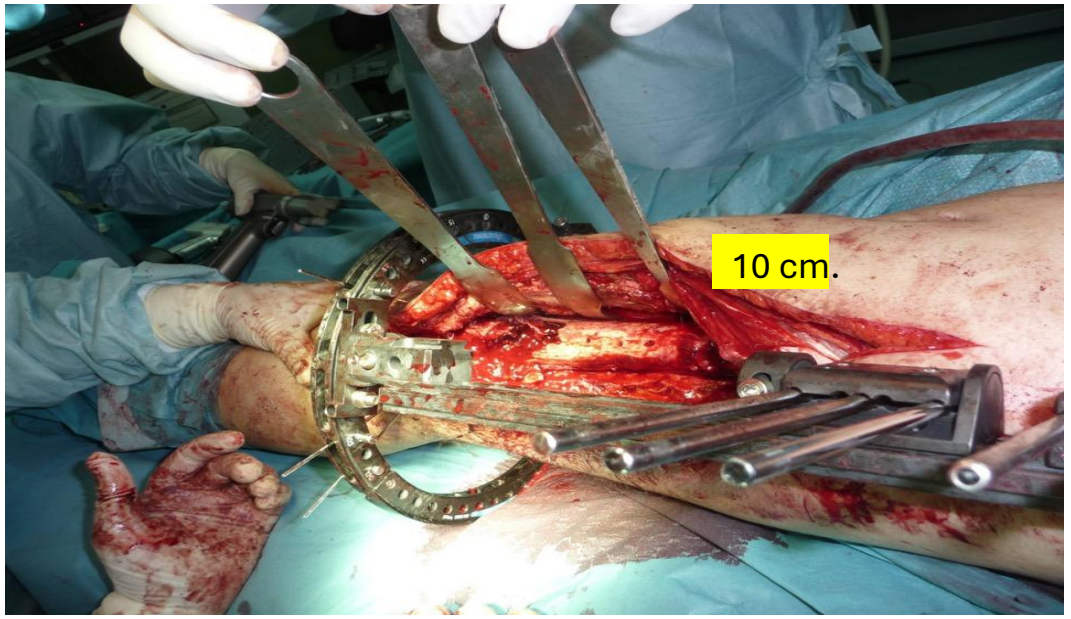
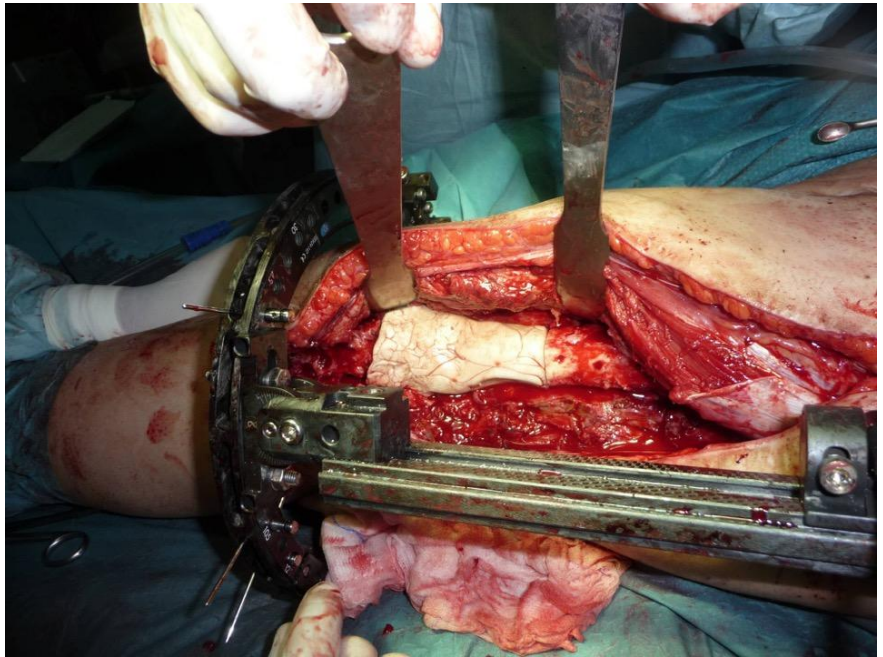
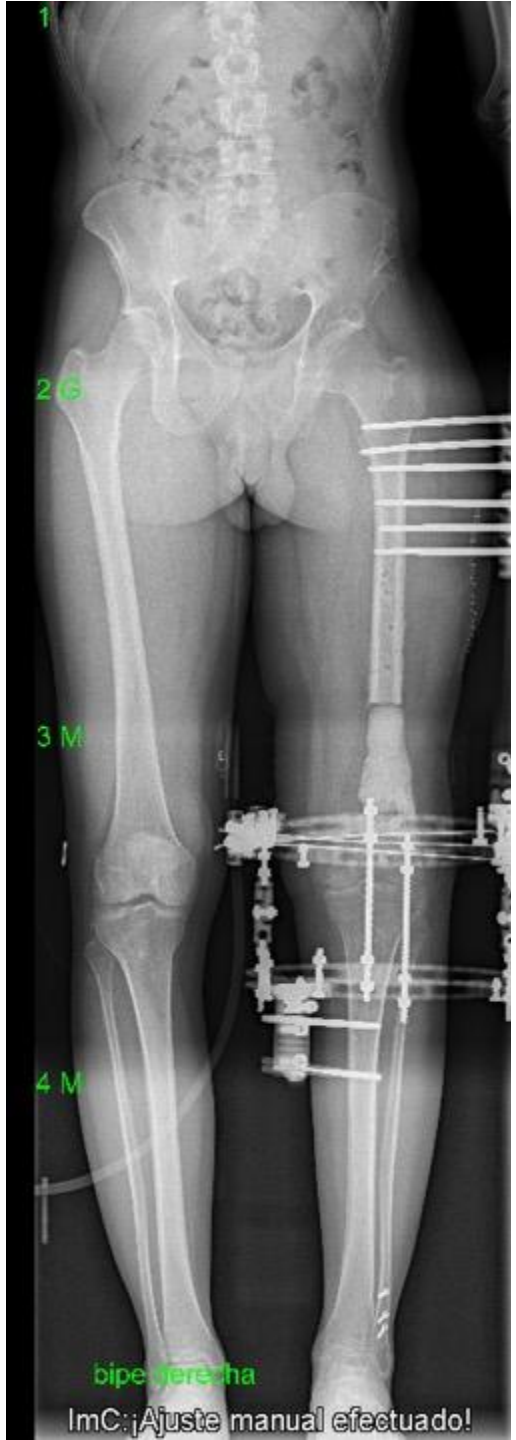


LO SBRIGLIAMENTO È LA PARTE FONDAMENTALE DEL NOSTRO TRATTAMENTO



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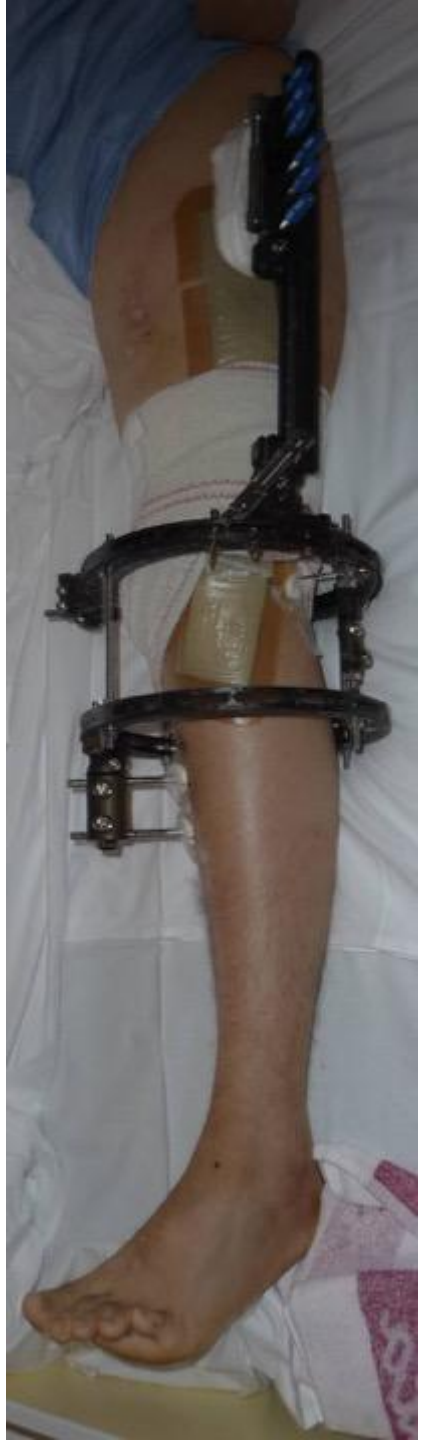
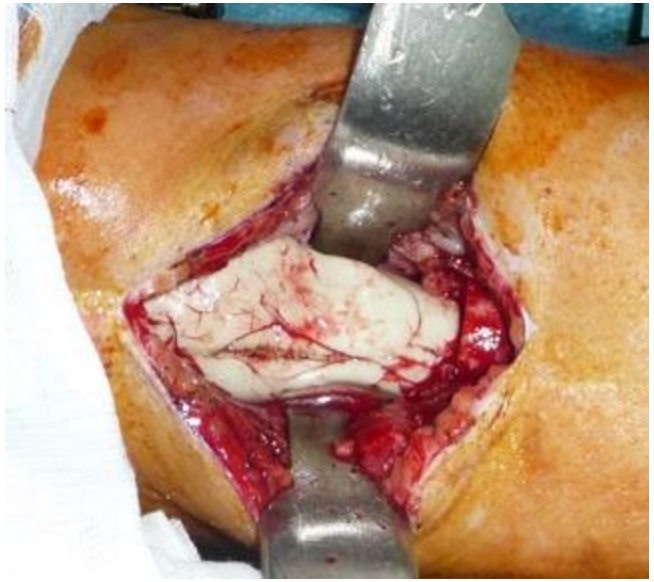
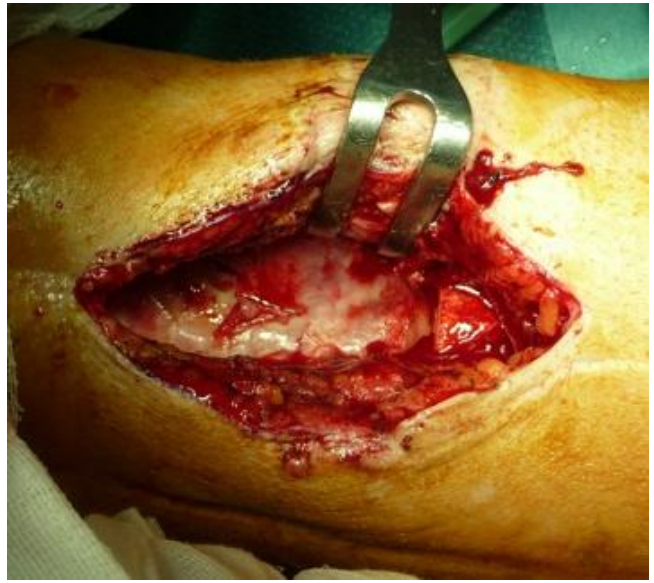
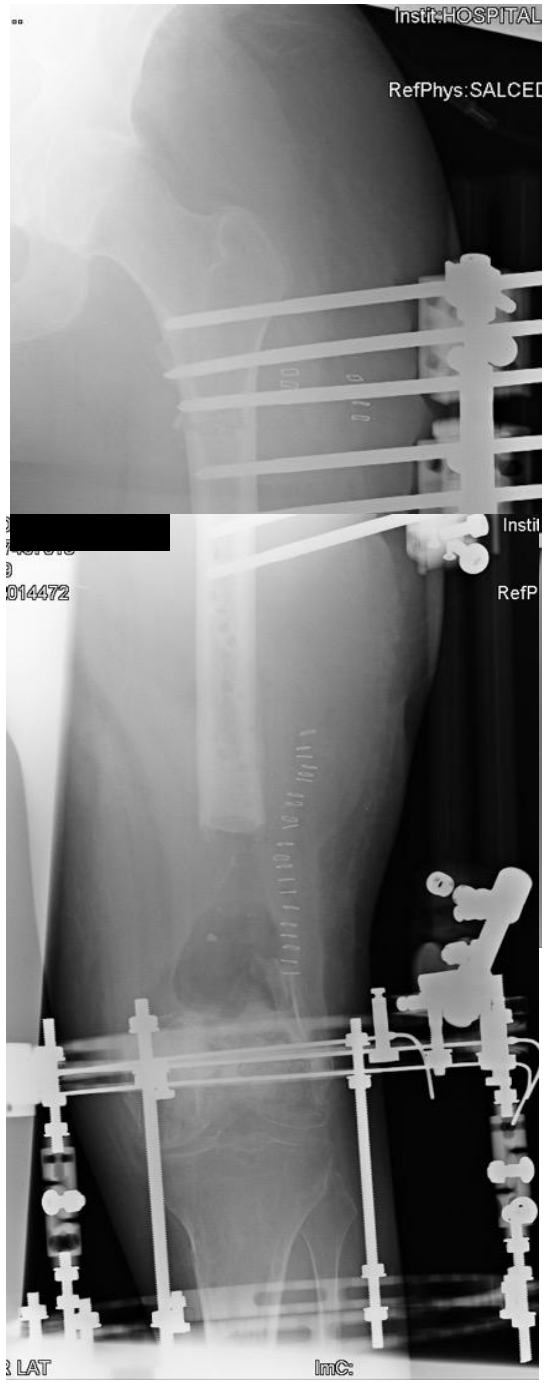
3 M
4 M
bipe derecha
ImC:¡Ajuste manual efectuado!








Instit:HOSPITAL
RefPhys:SALCED
Instil
RefP
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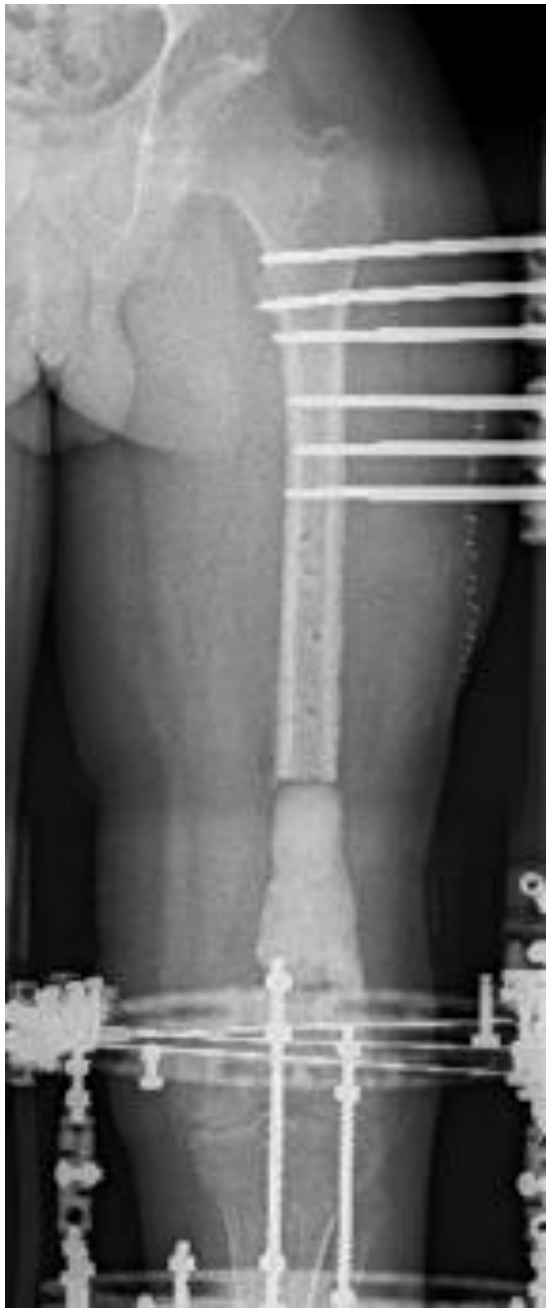
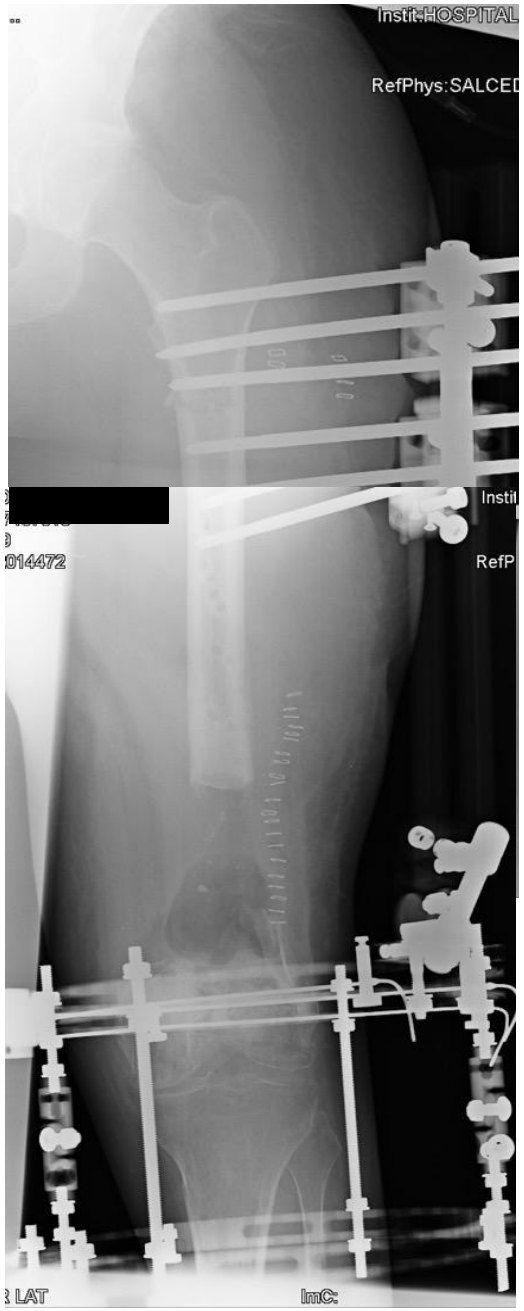
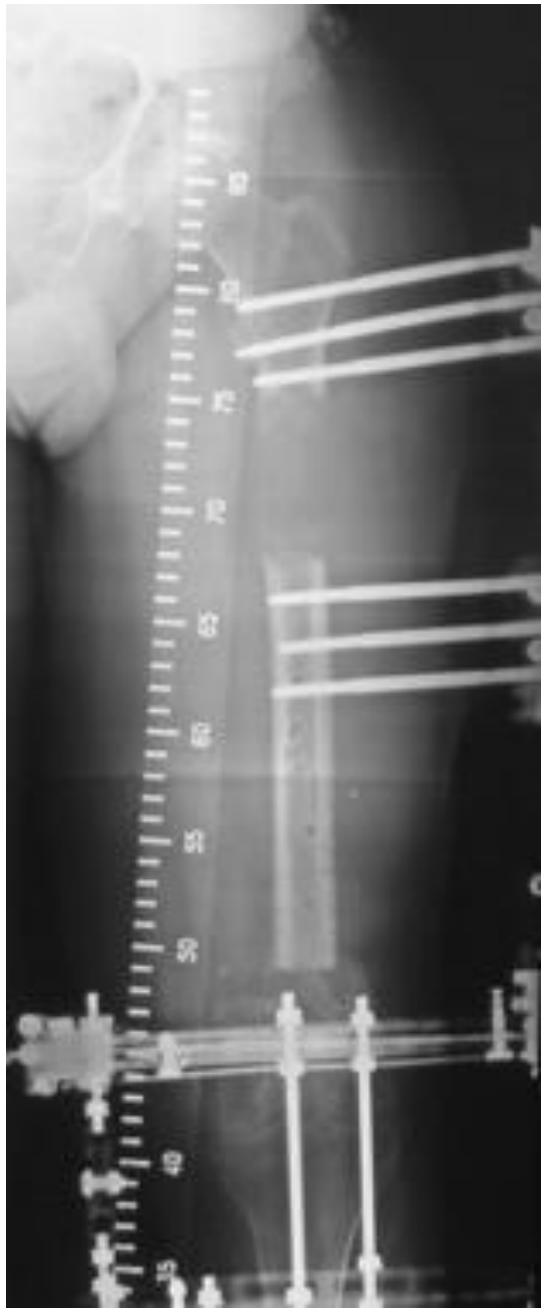
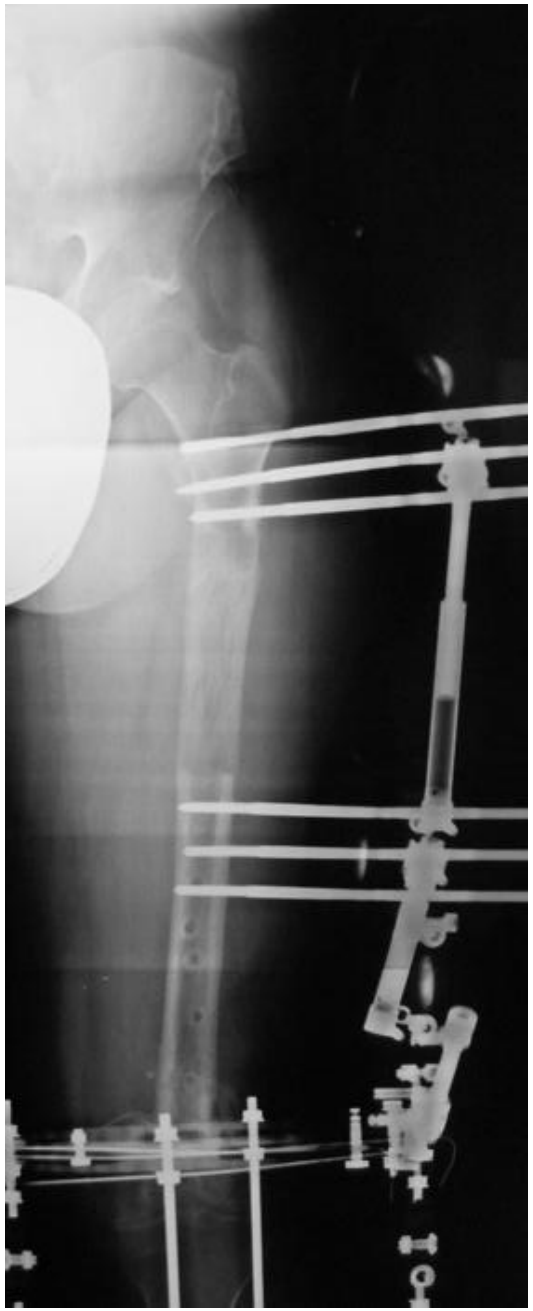
LAT
ImC:

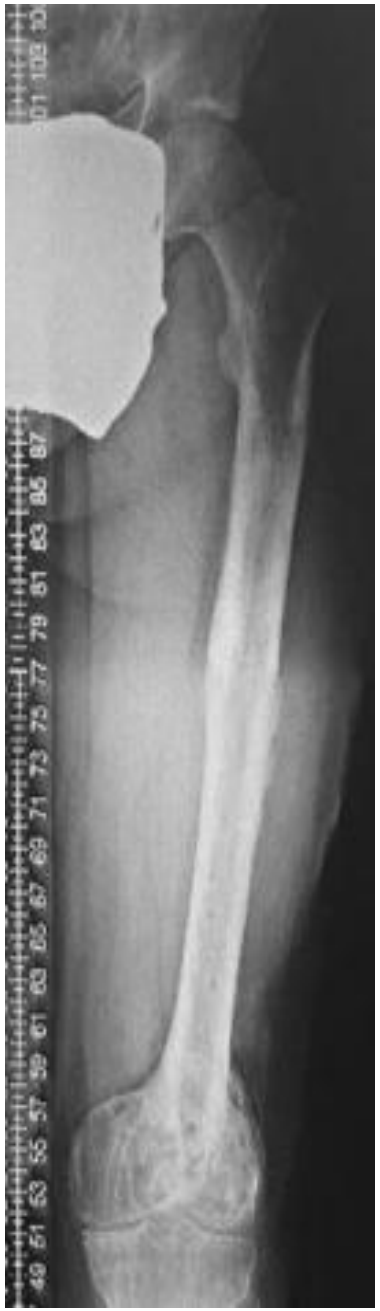
PROCESSO EVOLUTIVO DI UN TRASPORTO OSSEO FEMORALE ANTEROGRADO 12 CM.





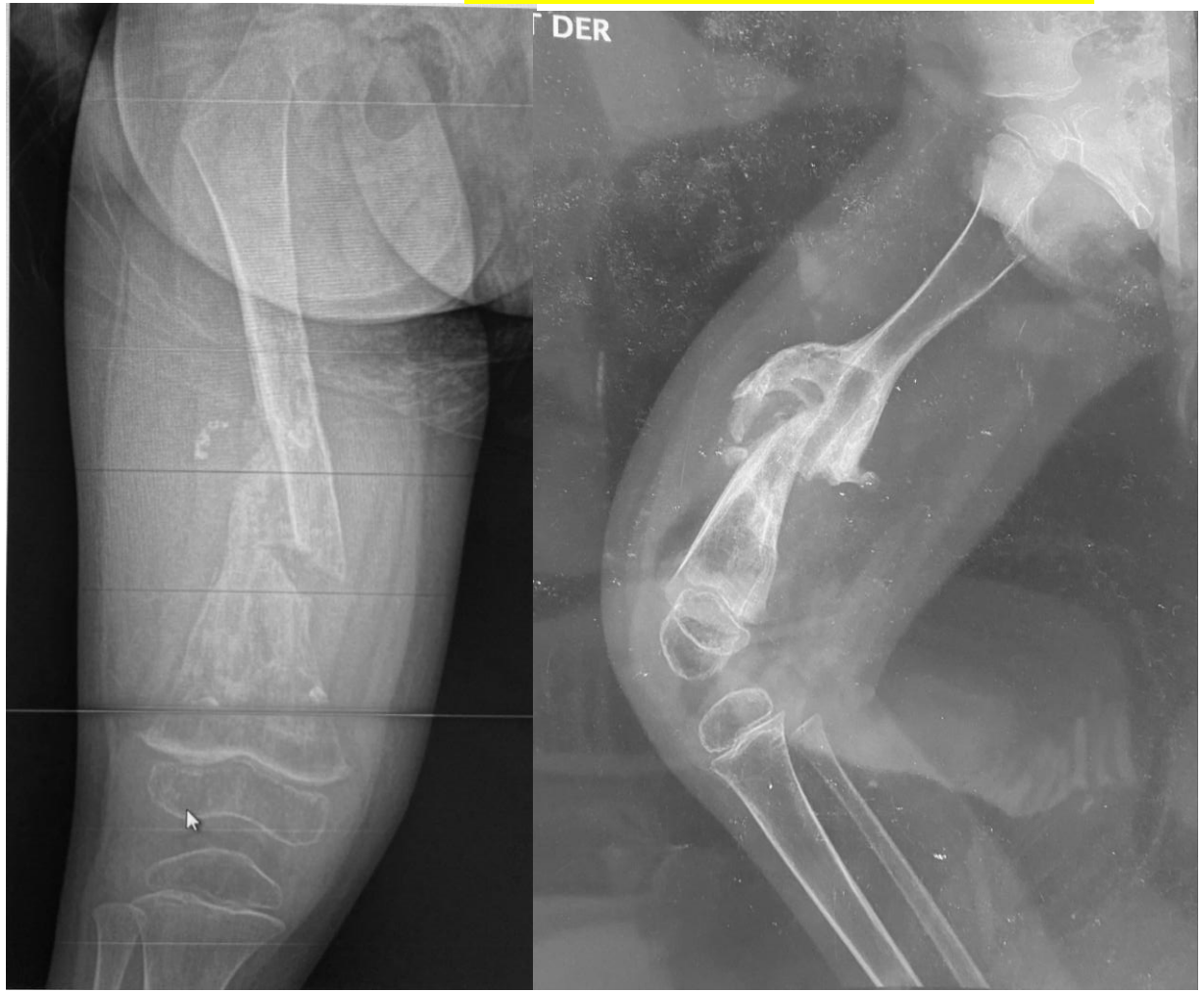




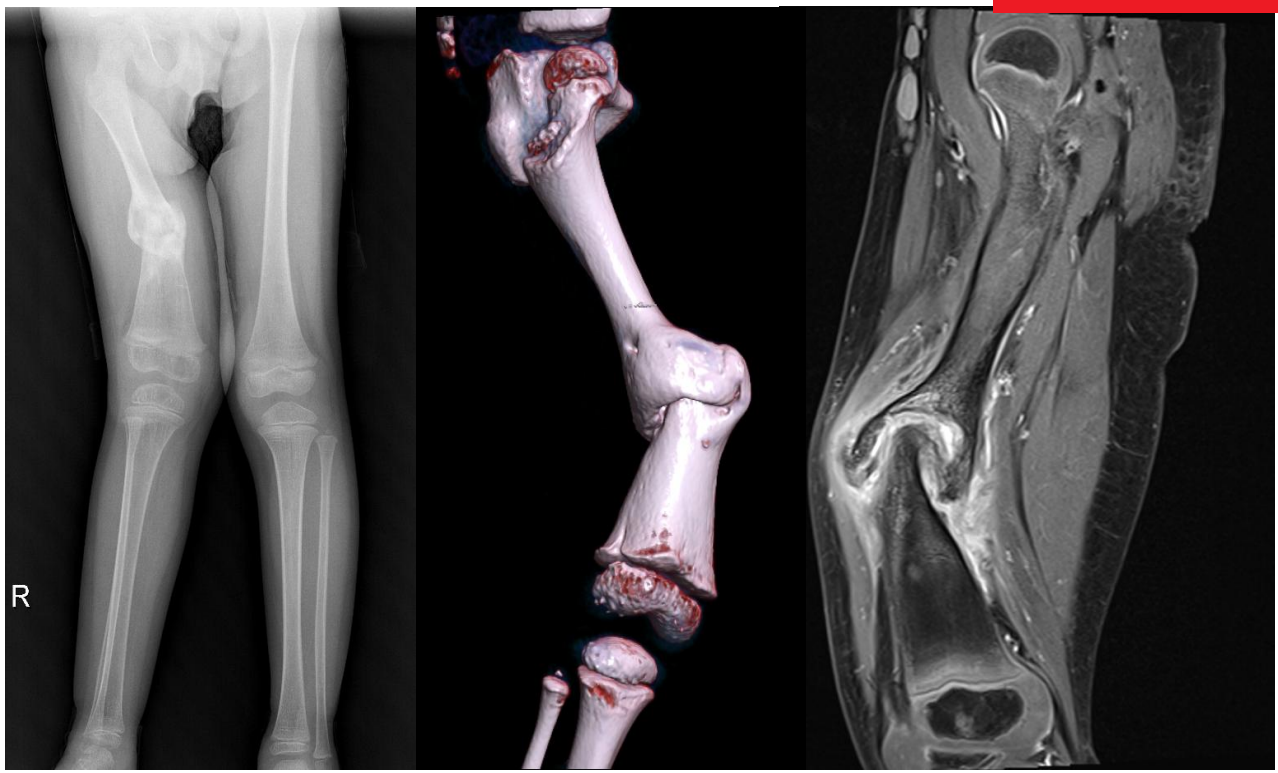


PSEUDOARTROSI FEMORALE CON ACCORCIAMENTO E DEFORMITÀ DOPO FX PATOLOGICA (OSTEOMIELITE)

BAMBINO DI 7 ANNI



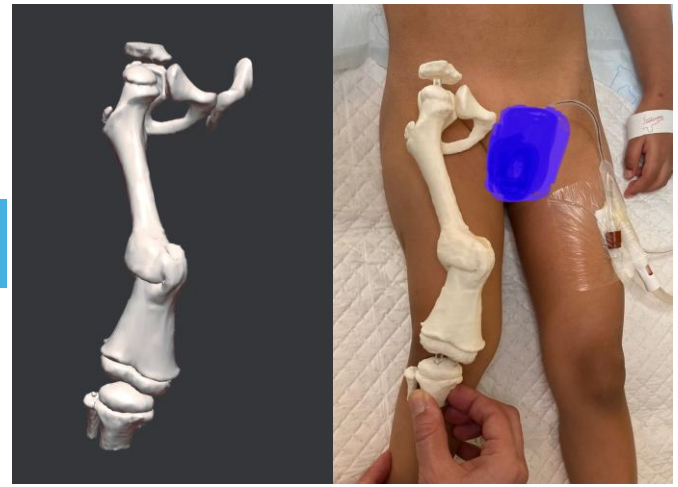
IL BAMBINO È ARRIVATO DALL'ECUADOR TRAMITE UNA ONG

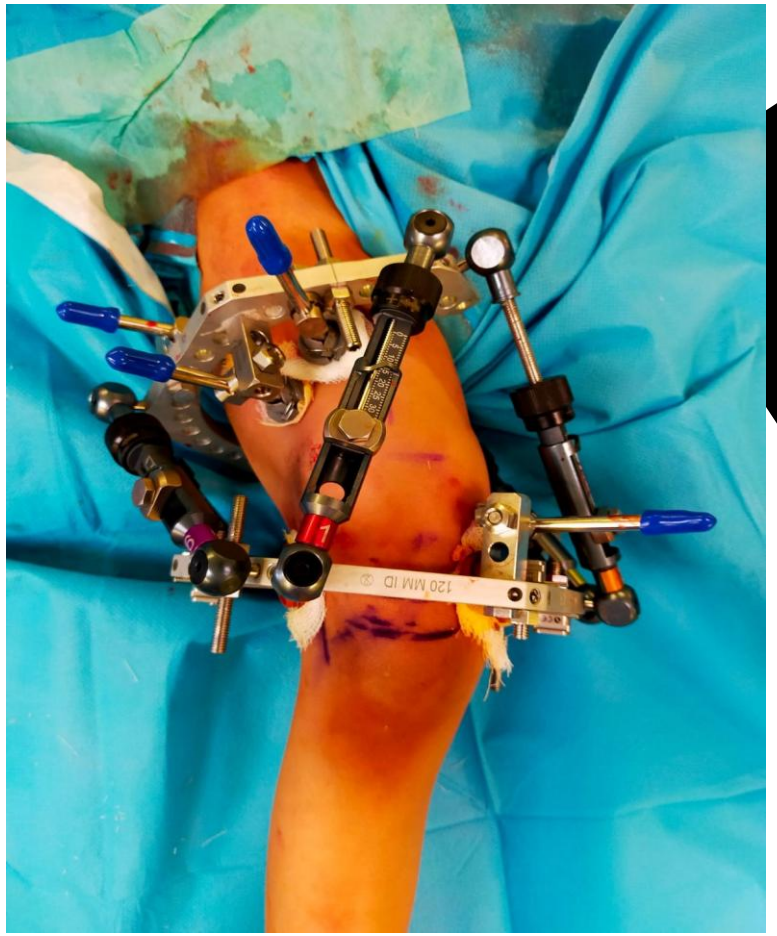


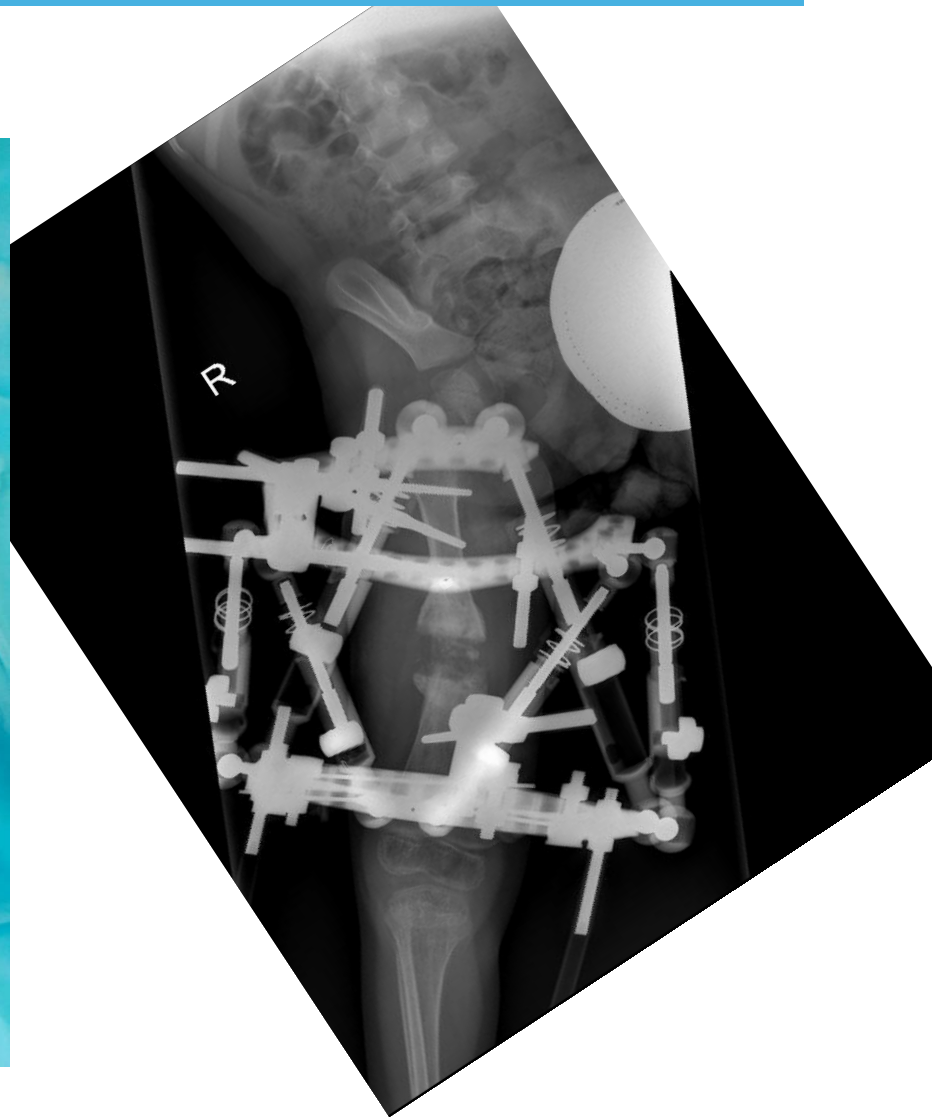
CT-SCAN, RISONANZA MAGNETICA, GAMMA, ESAMI DEL SANGUE...

FISSATORE ESAPODE ESTERNO

IMAGING 3D, STAMPA 3D

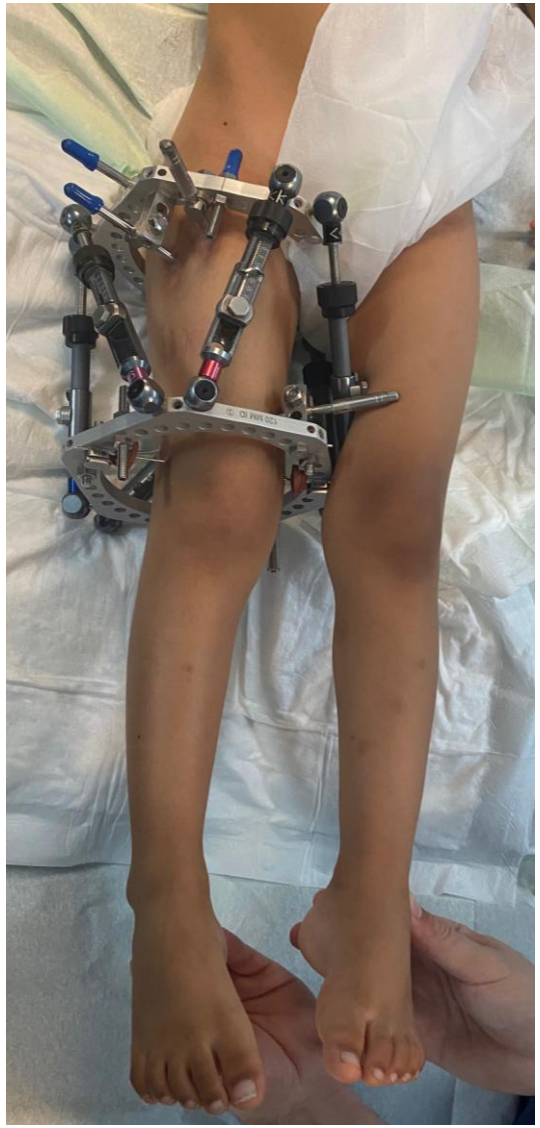


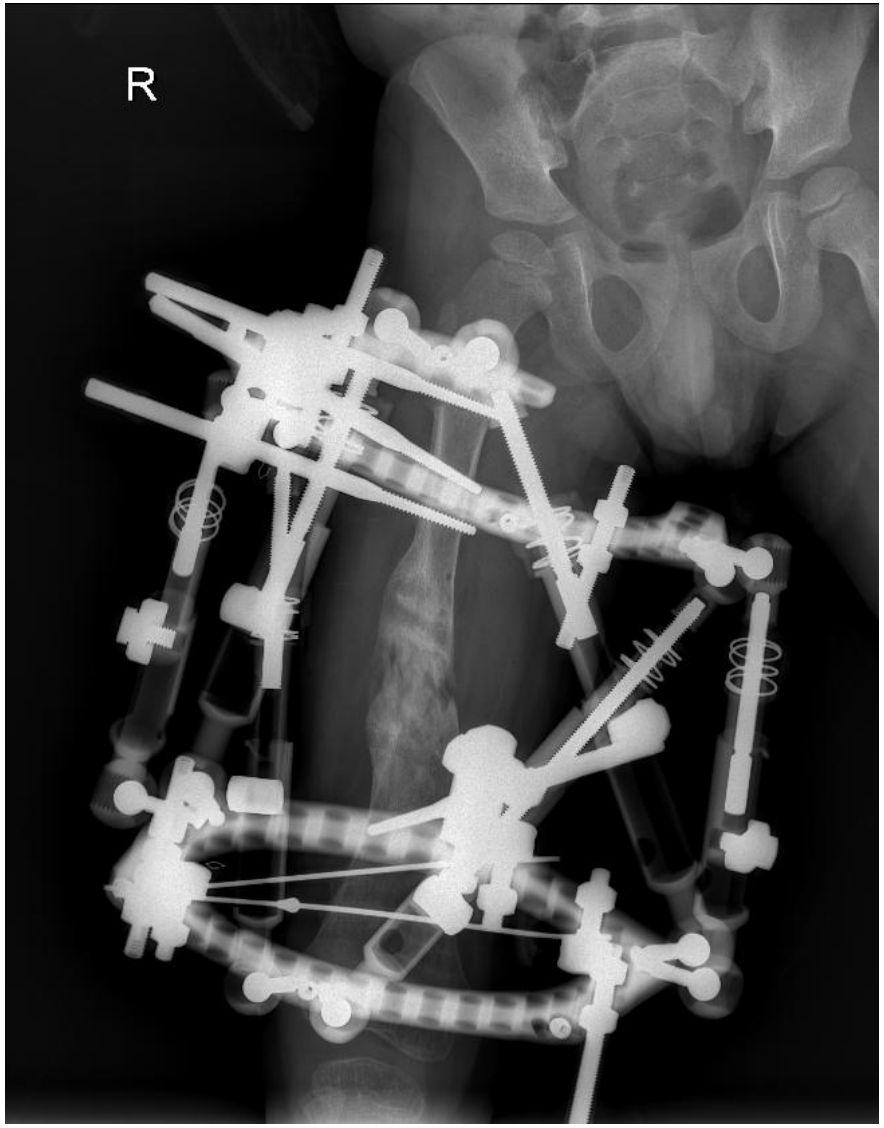




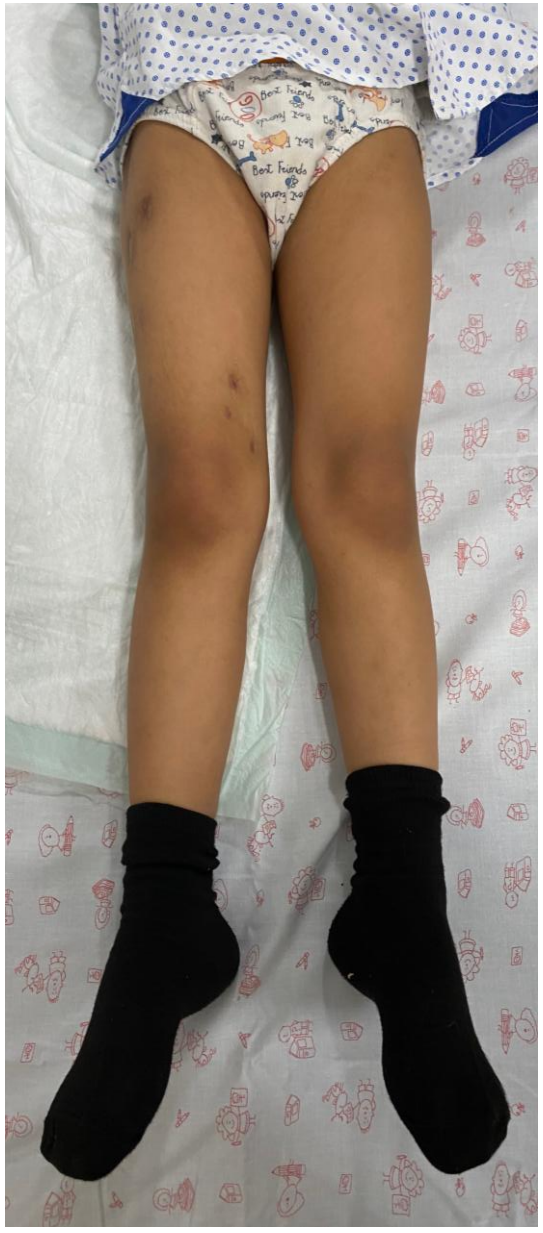
RICOVERO CONTINUO IN OSPEDALE: EVOLUZIONE CLINICA SODDISFACENTE

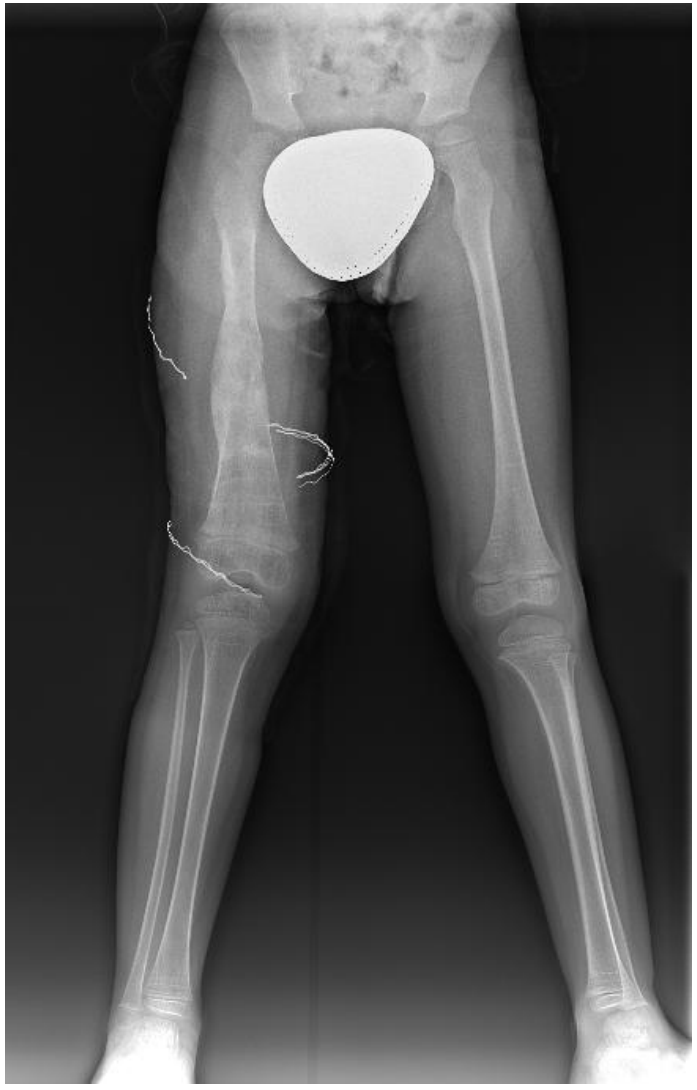
RIMOZIONE DELL'ESAPODE CIRCULAR FEXT

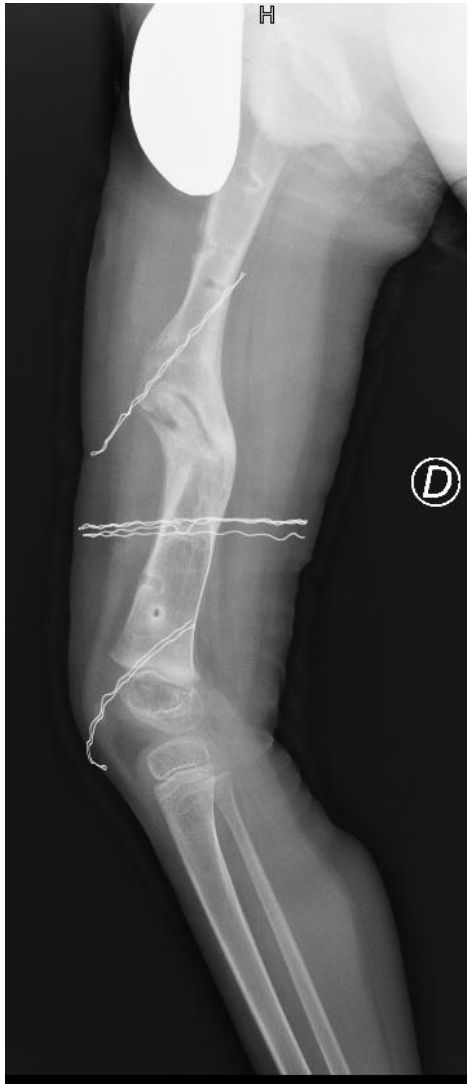




RISULTATO CLINICO - Radiografia



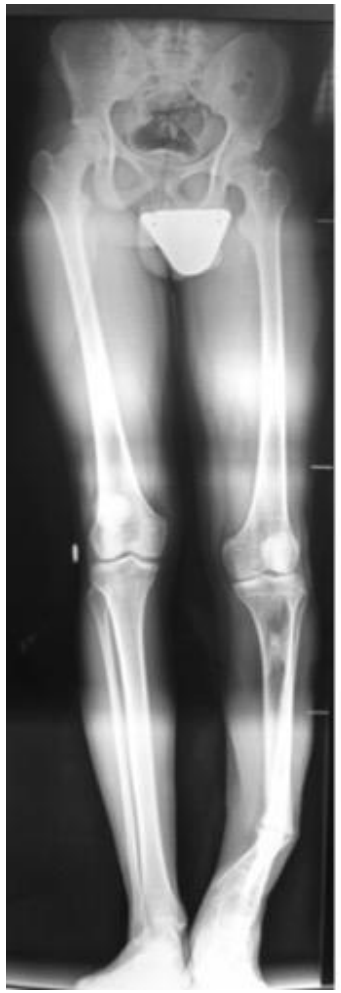


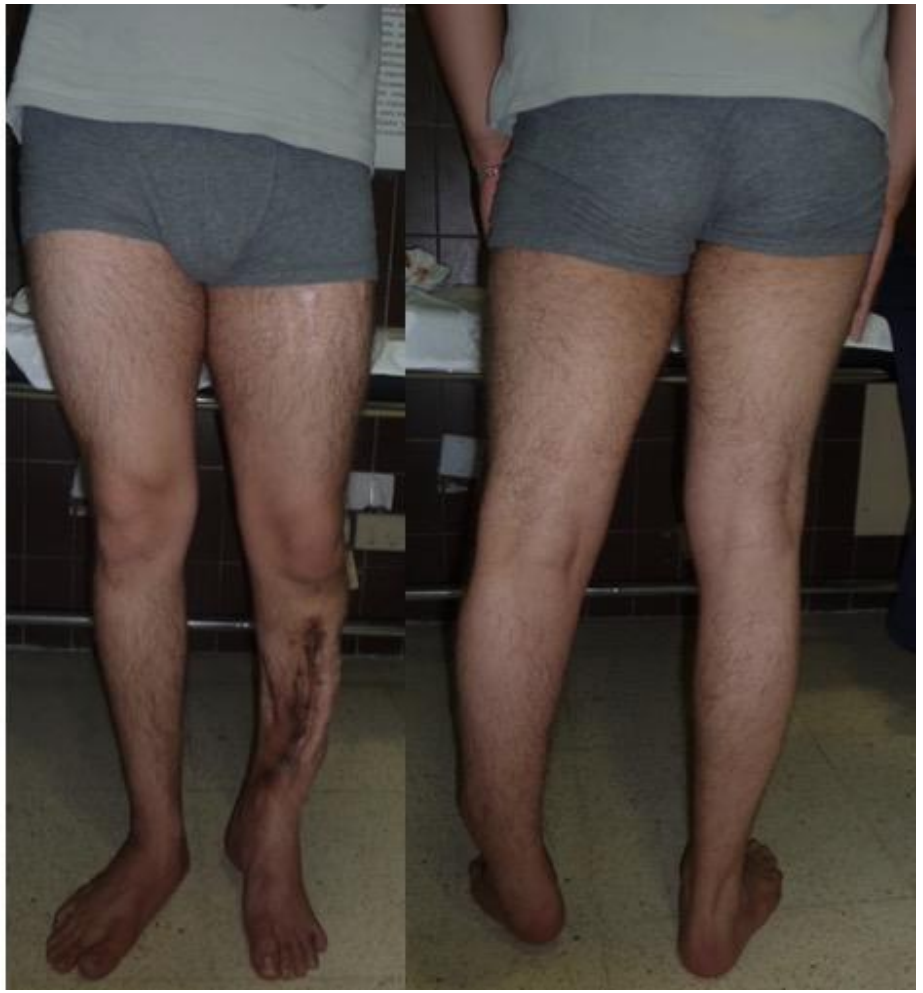


IPERTROFICA MOBILE (PSEUDOARTROSI)

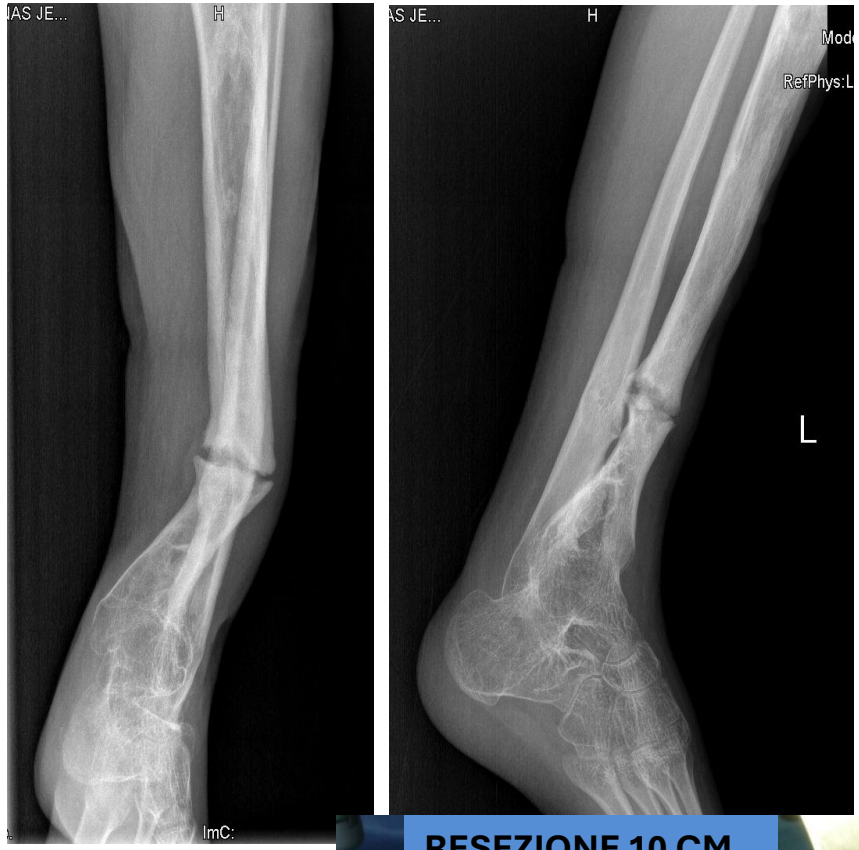
RESEZIONE DI PSEUDO E FE CON TRASPORTO OSSEO

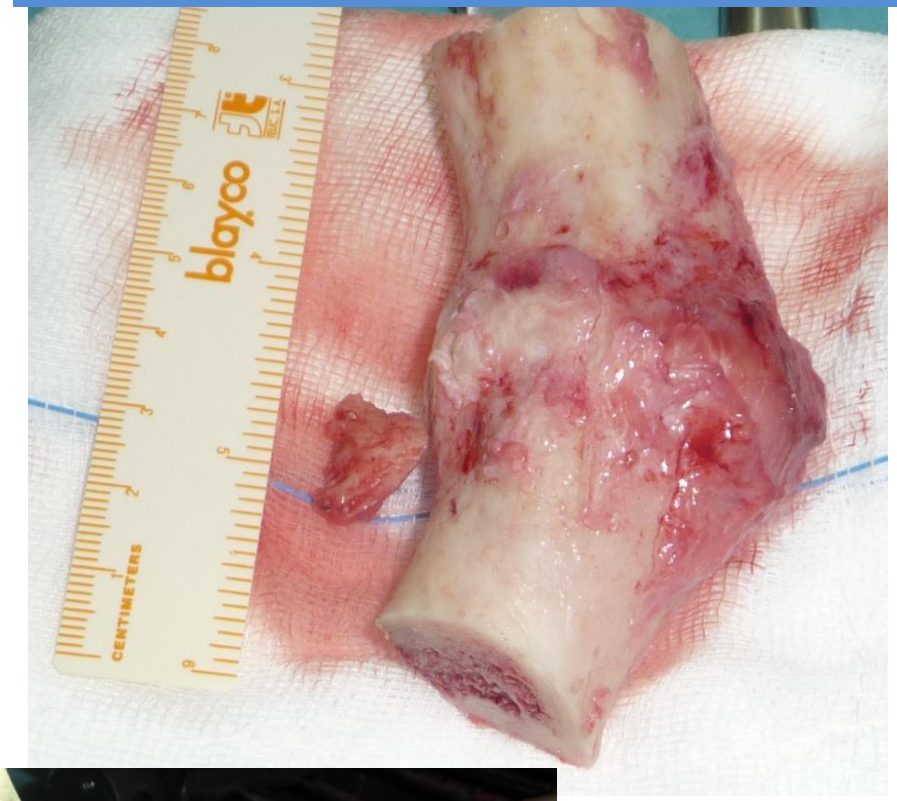
PSEUDOARTROSI DE TIBIA DISTALE CON CURVATURA VARO E ACCORCIAMENTO MASCHIO 18 A



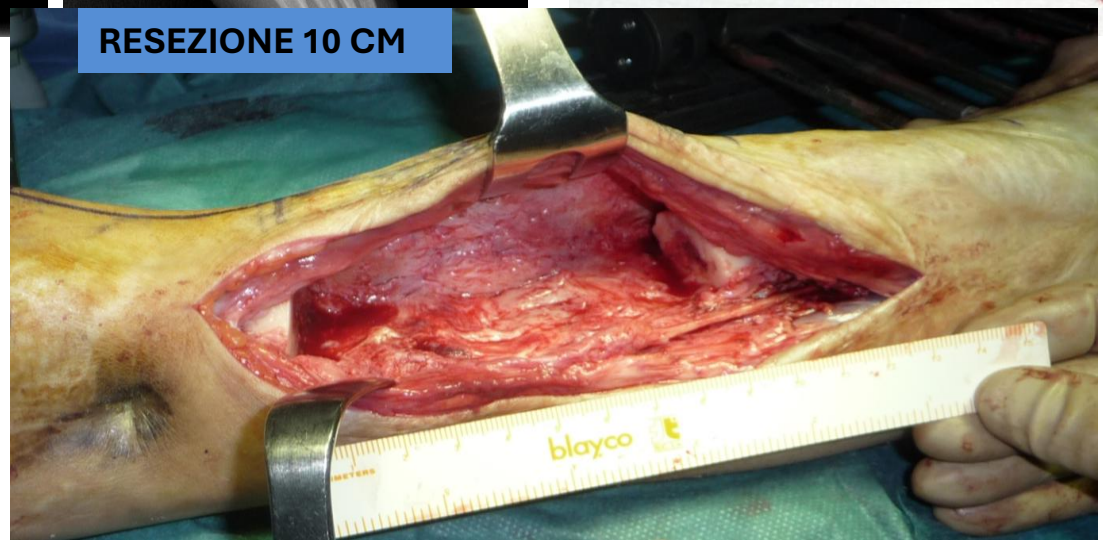


PSEUDOARTROSI IPERMOBILE

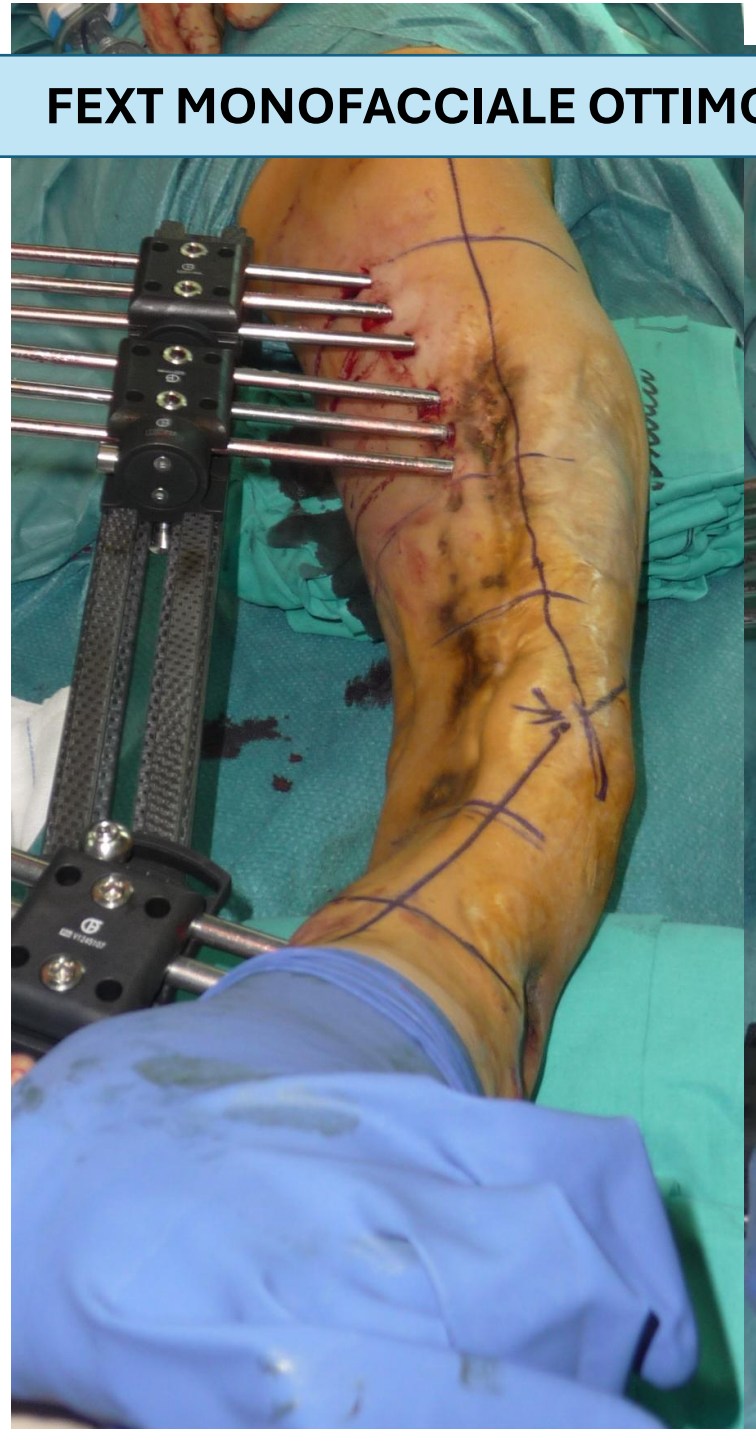


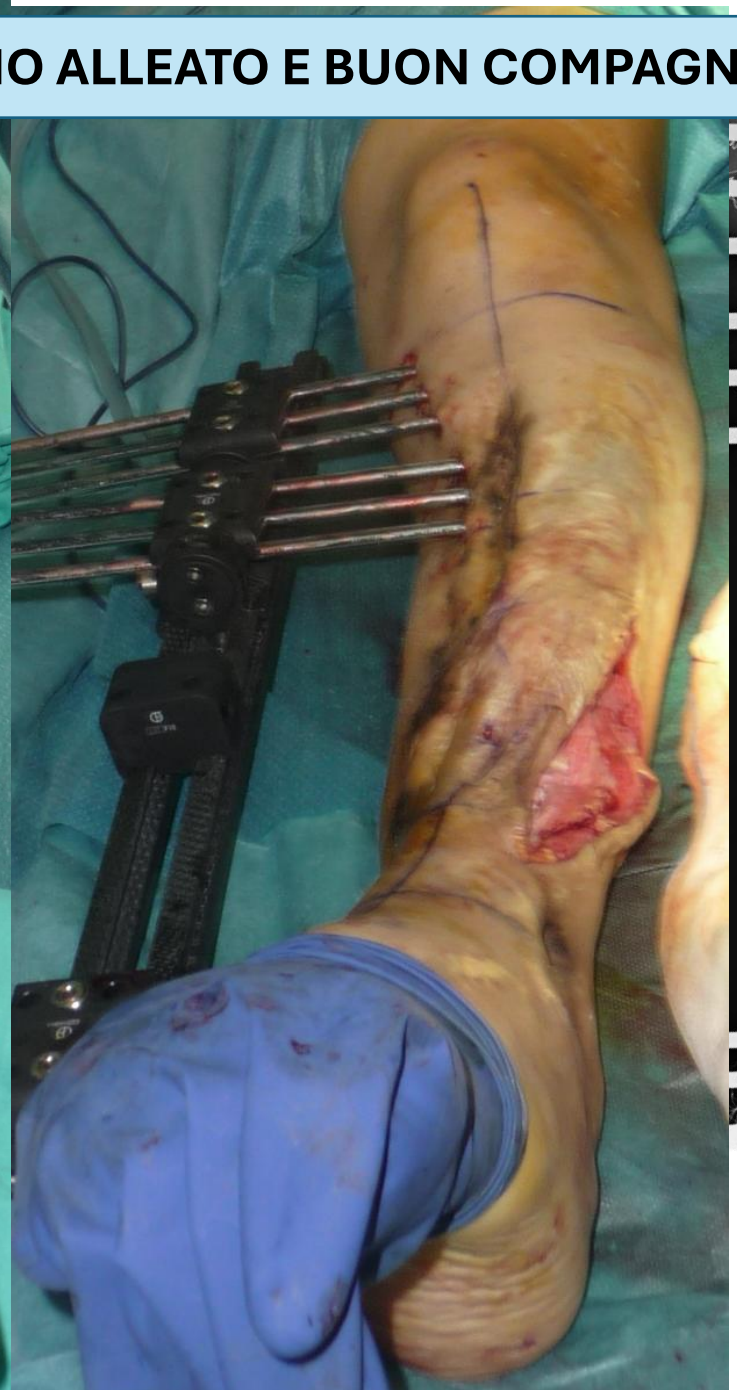


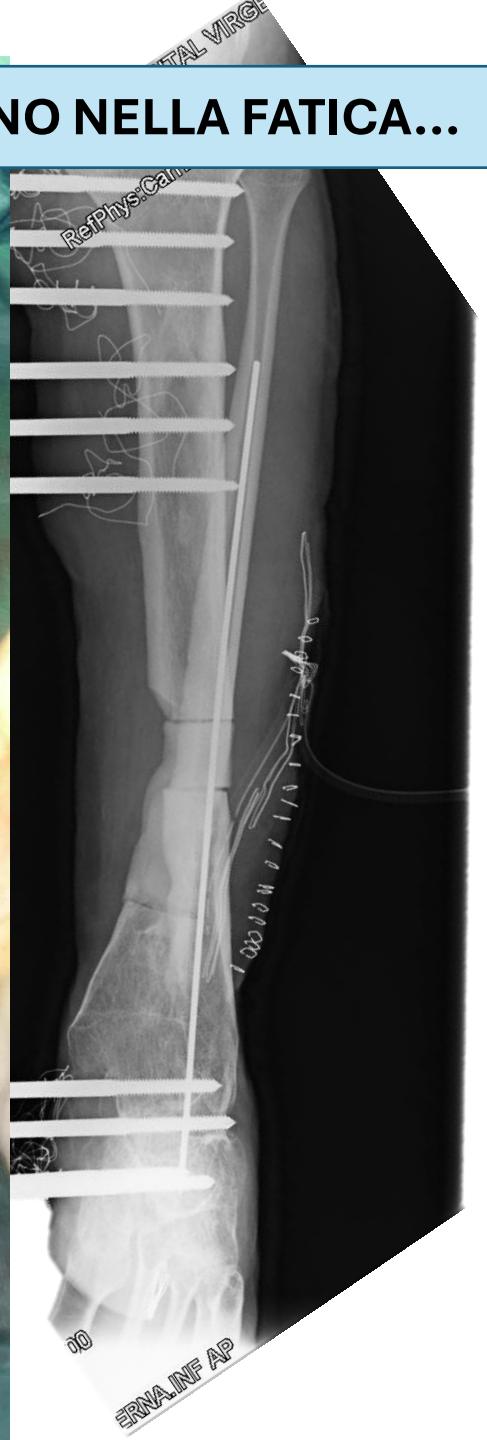
RESEZIONE 10 CM



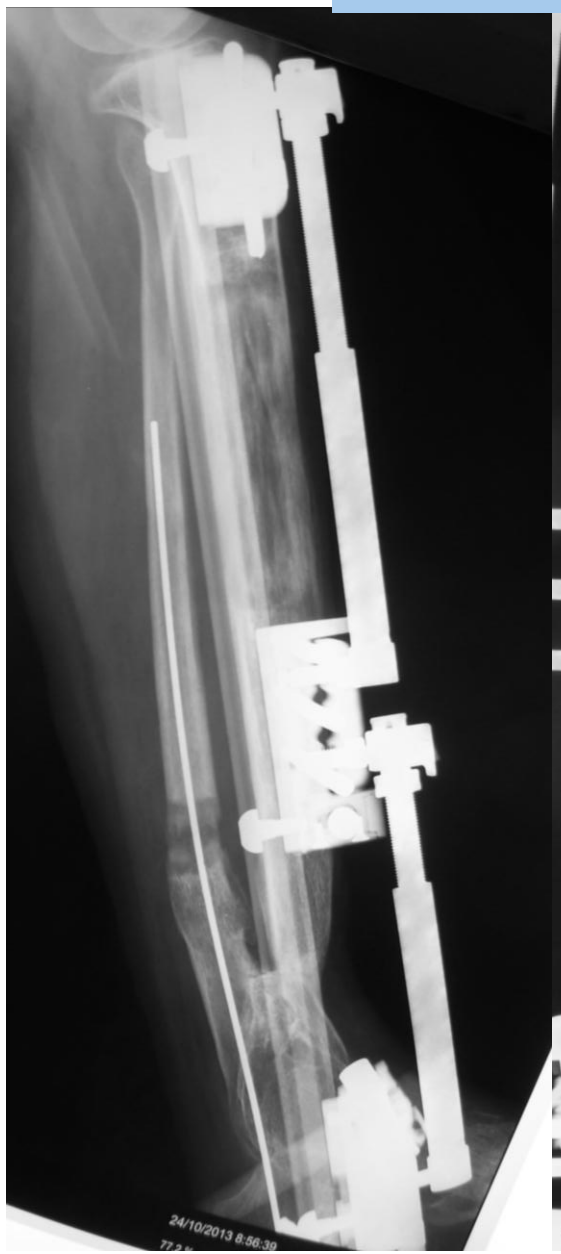
FEXT MONOFACCIALE OTTIMO ALLEATO E BUON COMPAGNO NELLA FATICA...

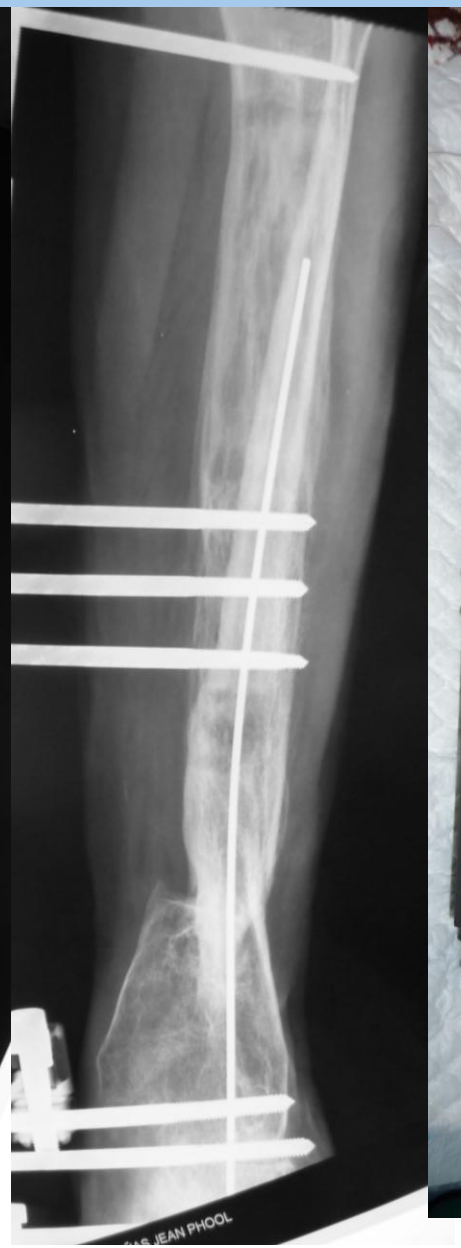


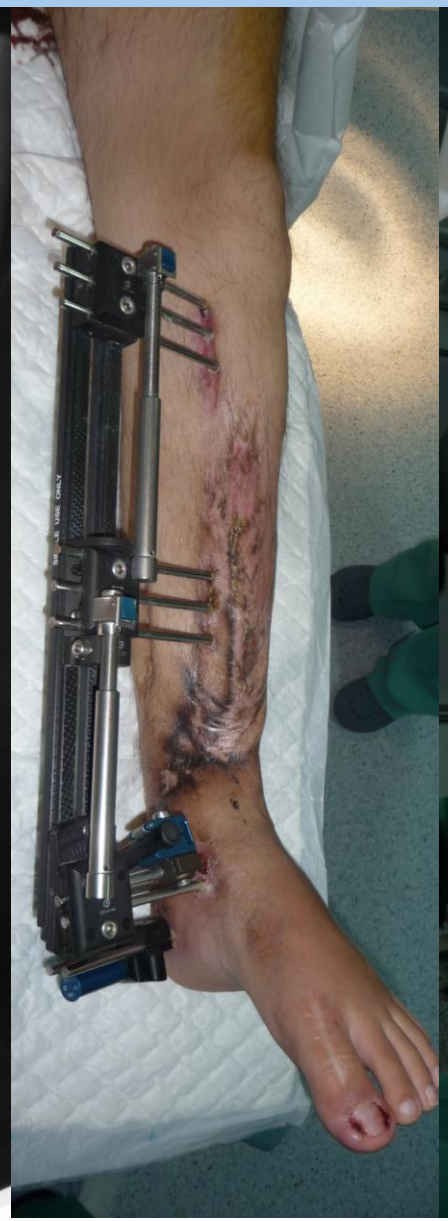


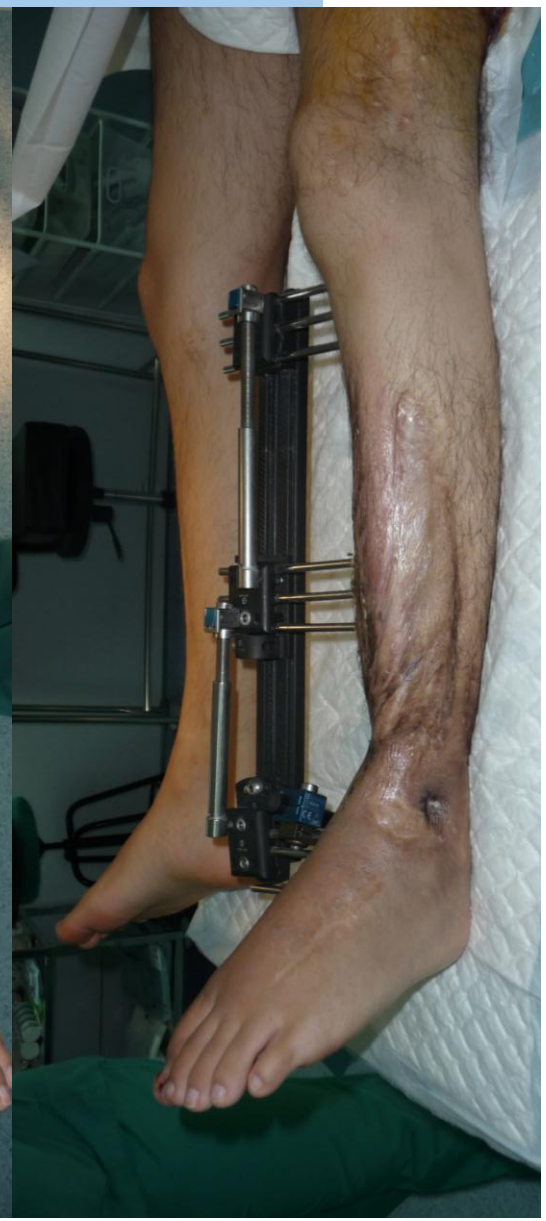


GUARIGIONE DEL TRASPORTO OSSEO
NESSUN INPUT DI INNESTO ALL'ORMEGGIO

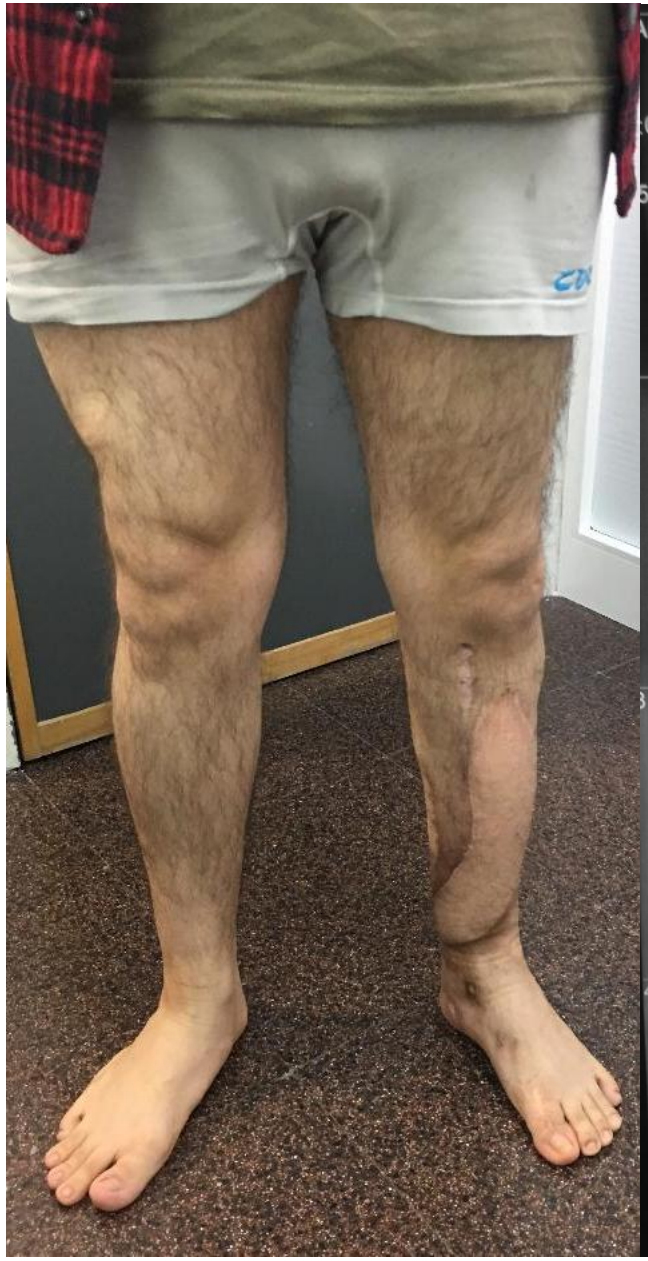


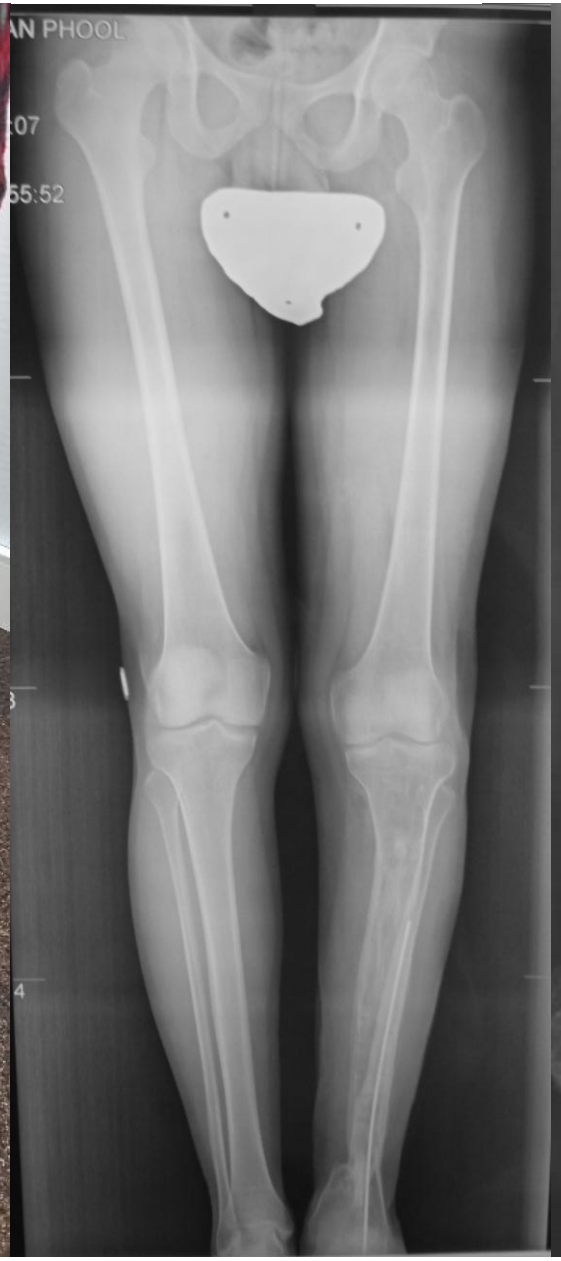


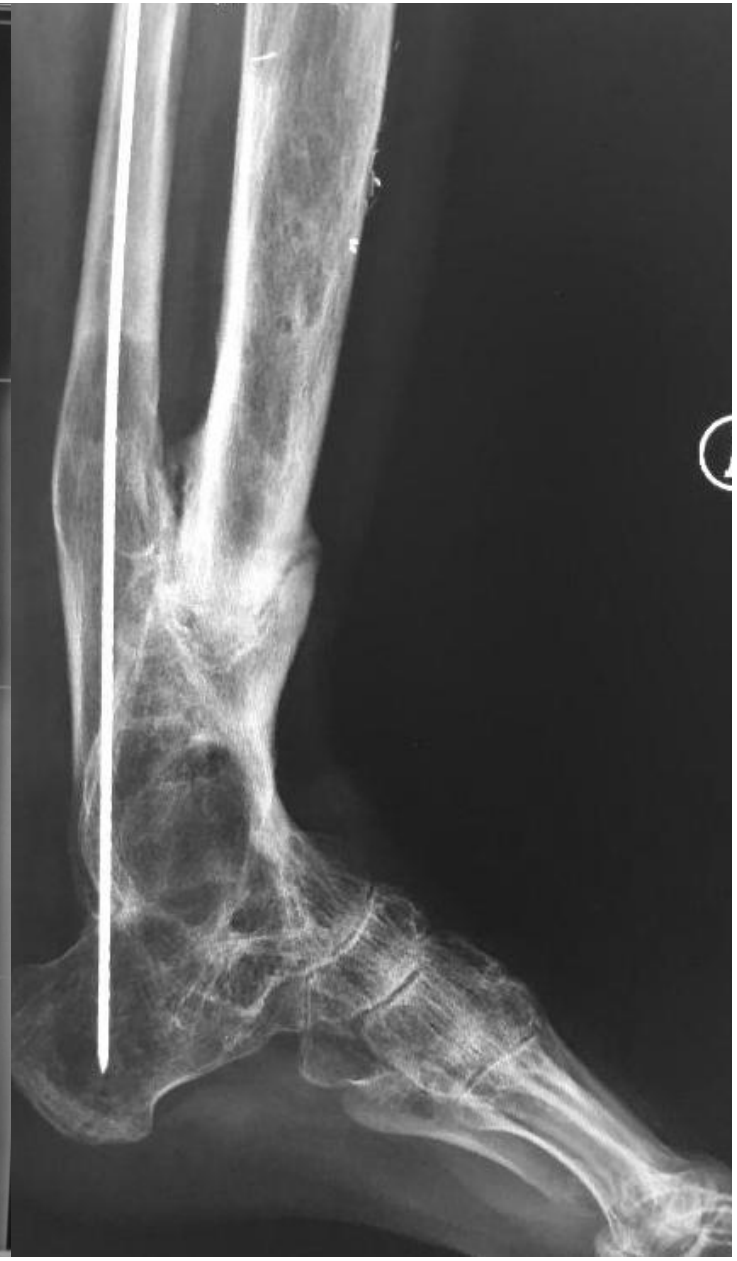




STATO ATTUALE DOPO L'ESECUZIONE DEL FLAP ATL CP PER MIGLIORARE IL PB







IPERTROFICA MOBILE (PSEUDOARTROSI) → RESEZIONE DI PSEUDO E FE CON TRASPORTO OSSEO

- ♂40 ANNI.
- ACC, CHE PRESENTA UNA FRATTURA DIAFISARIA TIBIALE APERTA (III-B), CHE È STATA URG:

F.E.

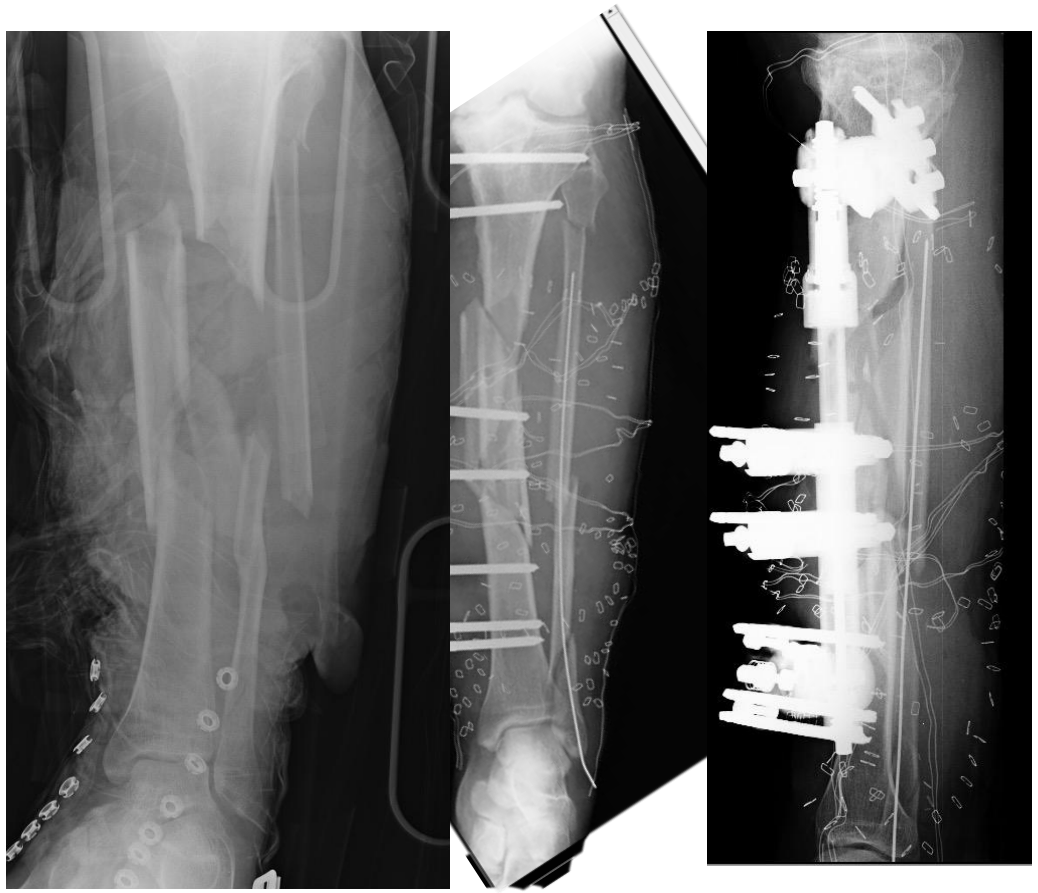
+

SERIE D&I

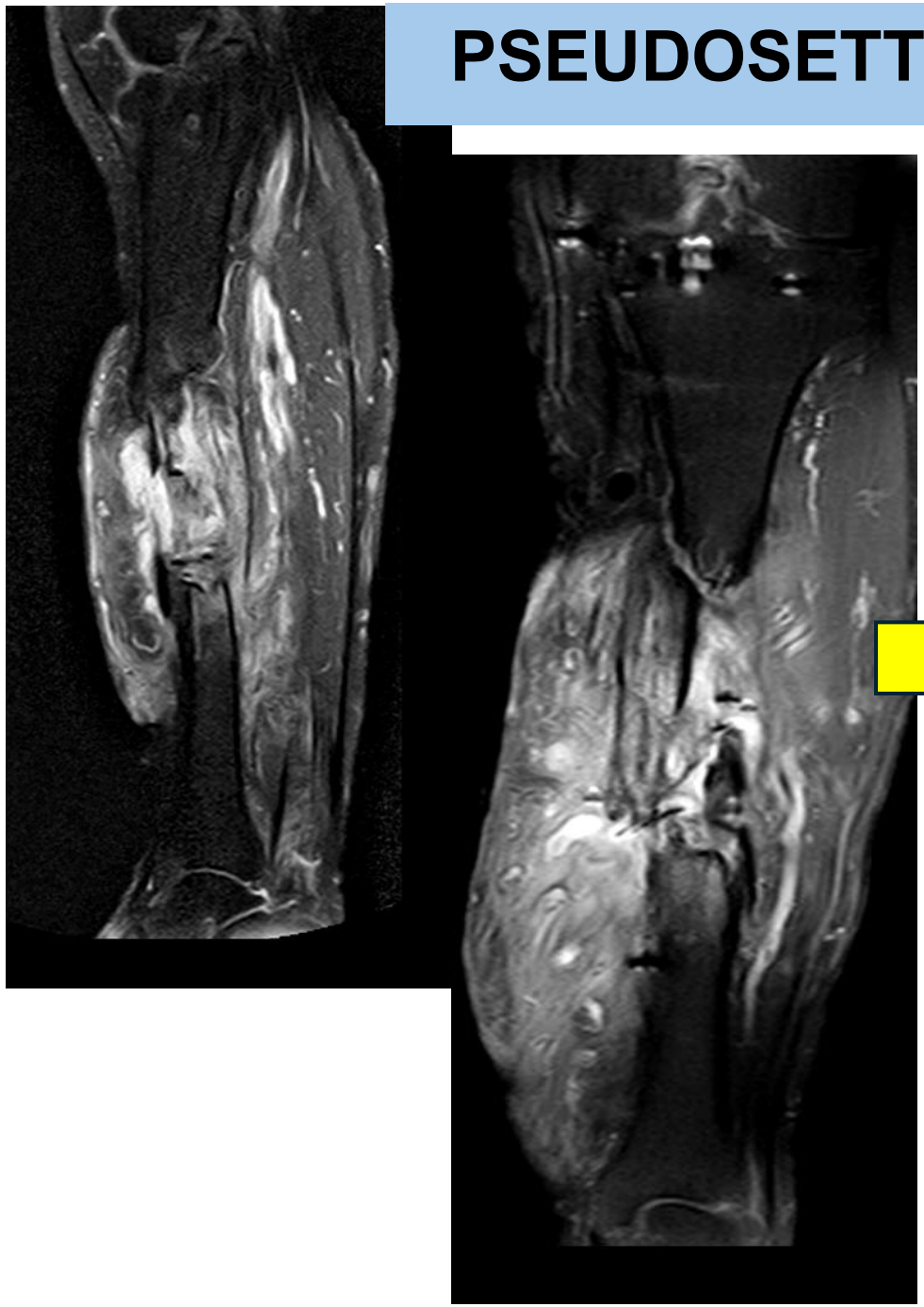
+

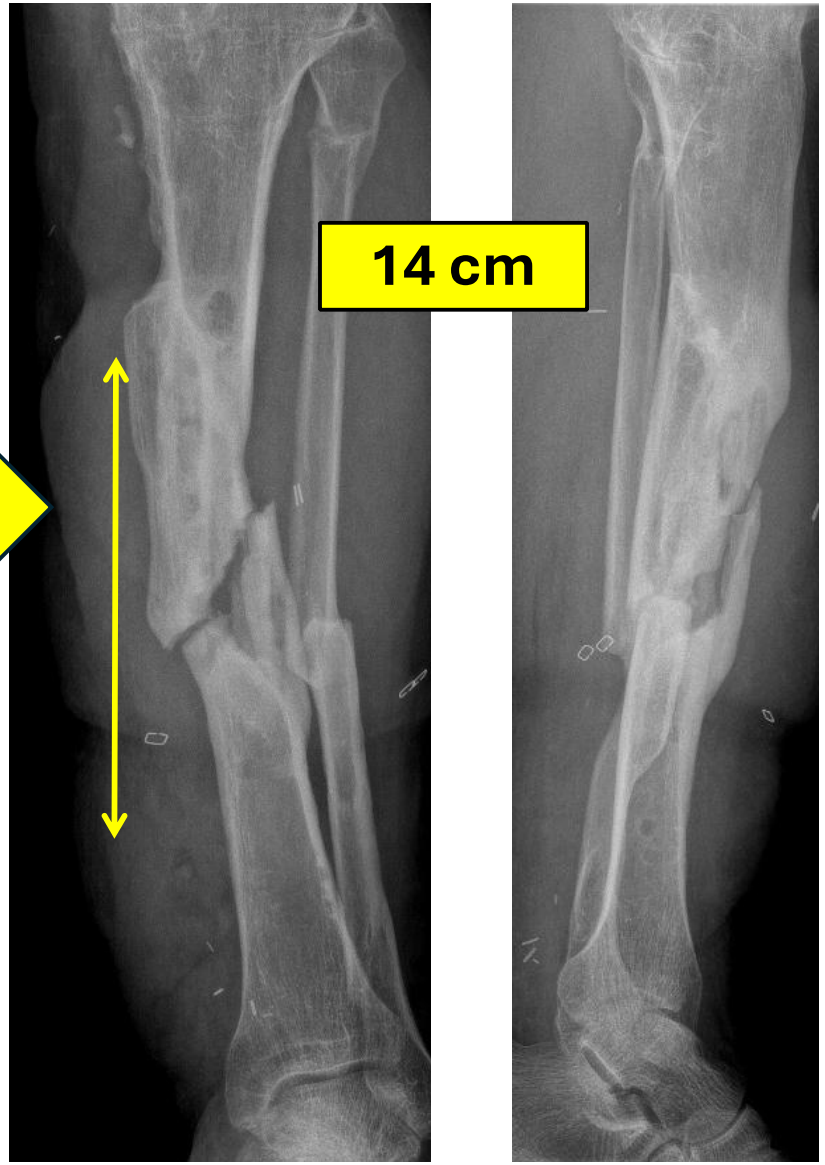
COPERTURA PRECOCE CON C. LATISSIMUS DORSI.

PSEUDOARTROSI SETTICA DE TIBIA

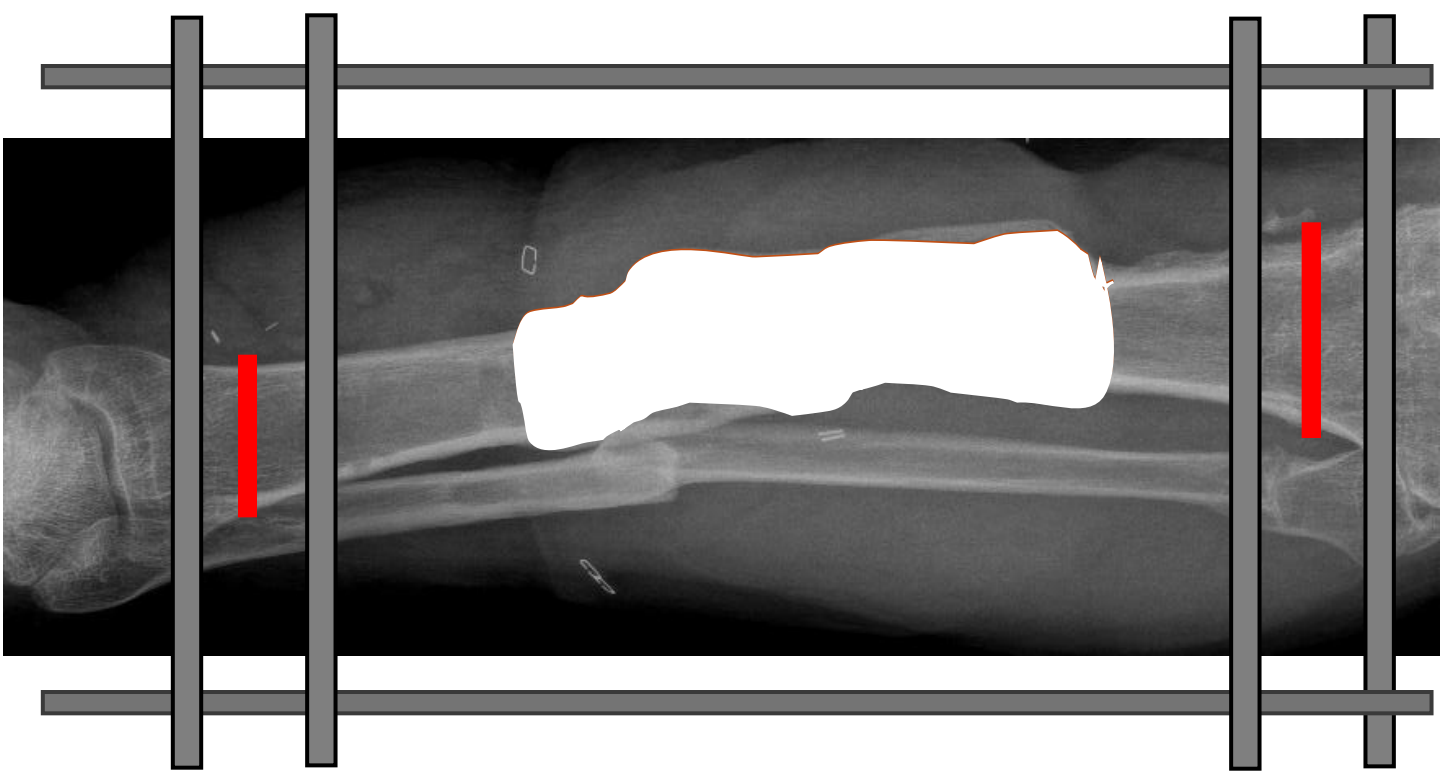


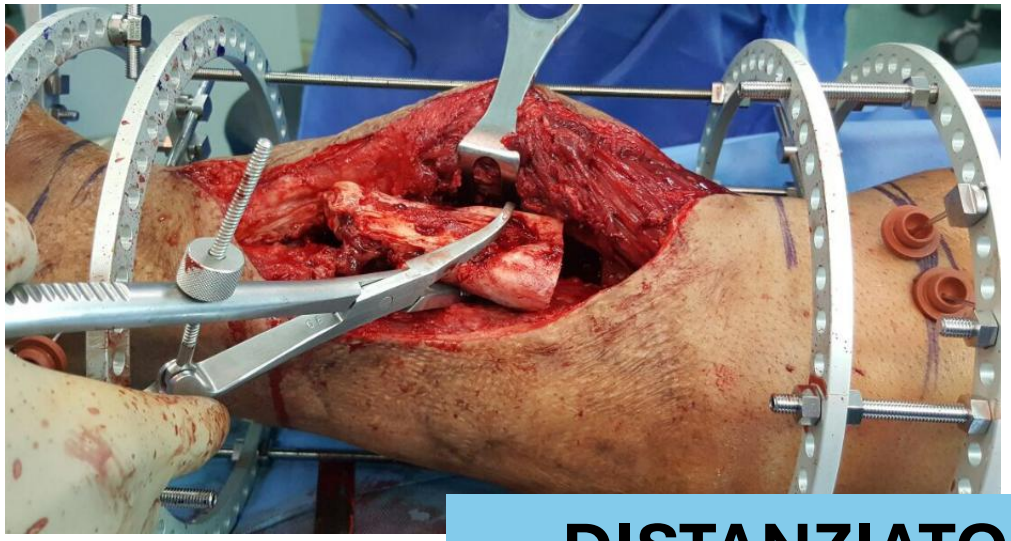
PSEUDOSETTICO DA SAMS, CON FISTOLA ATTIVA.

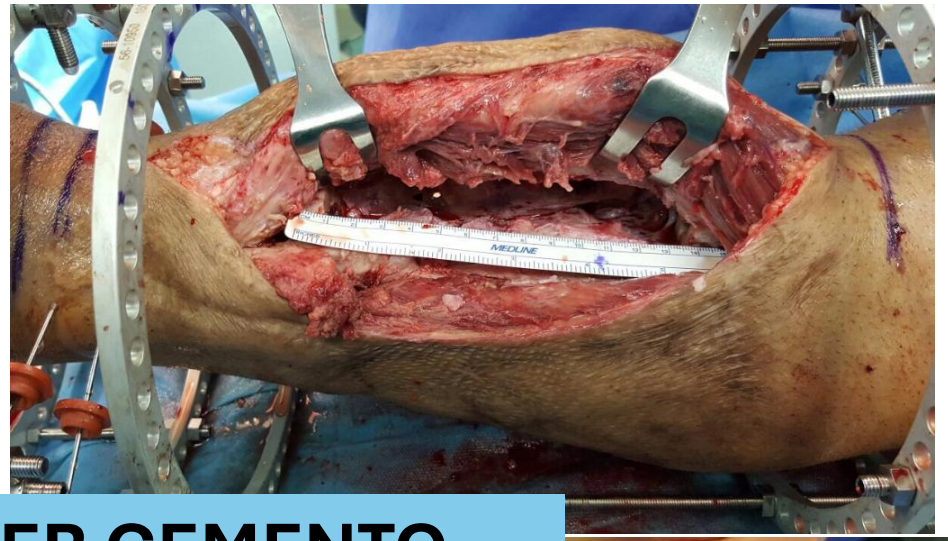




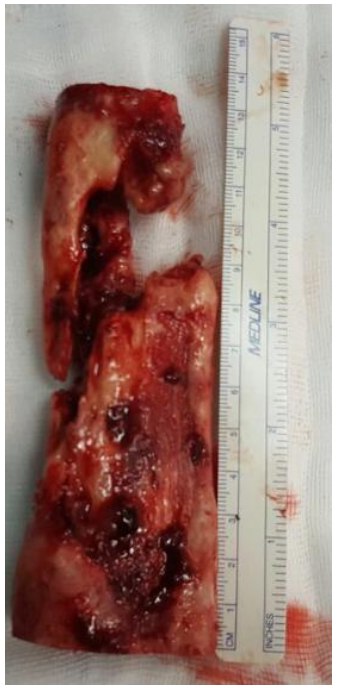
PIANIFICAZIONE

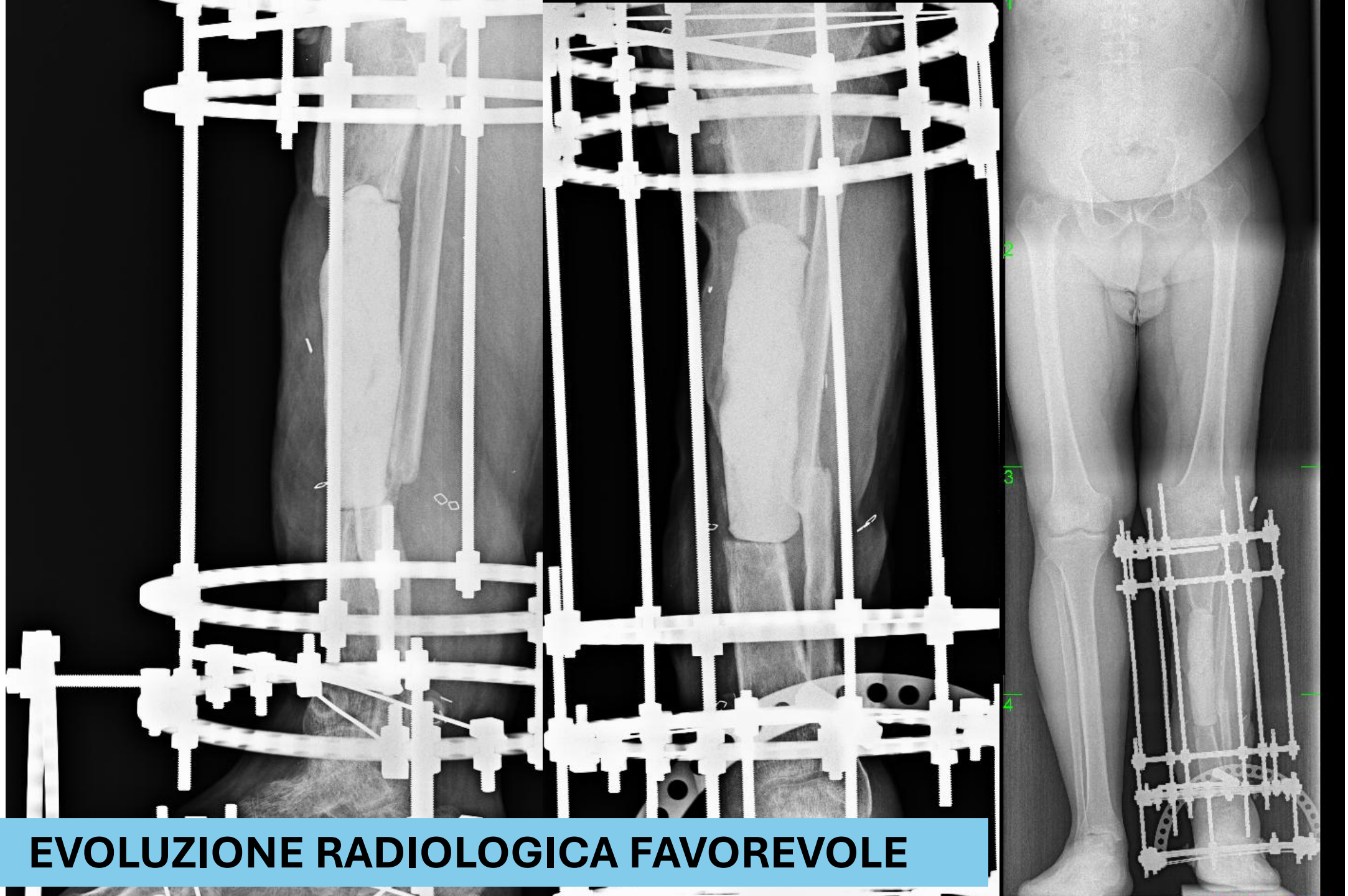




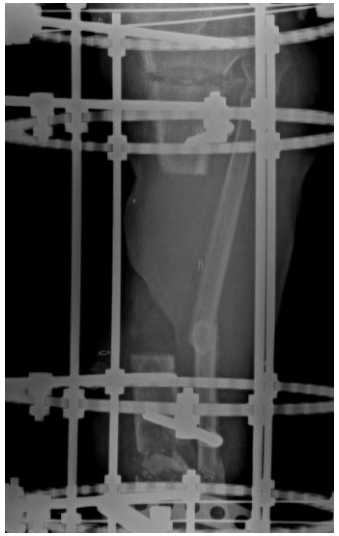


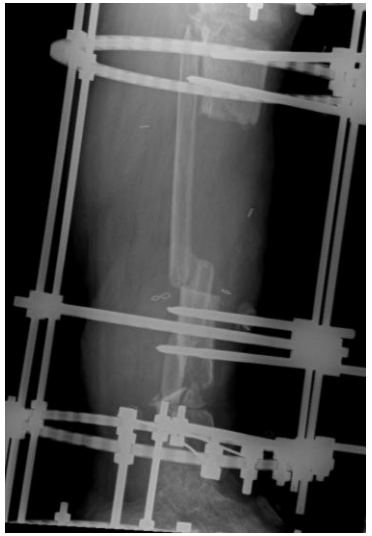
DISTANZIATORE PER CEMENTO

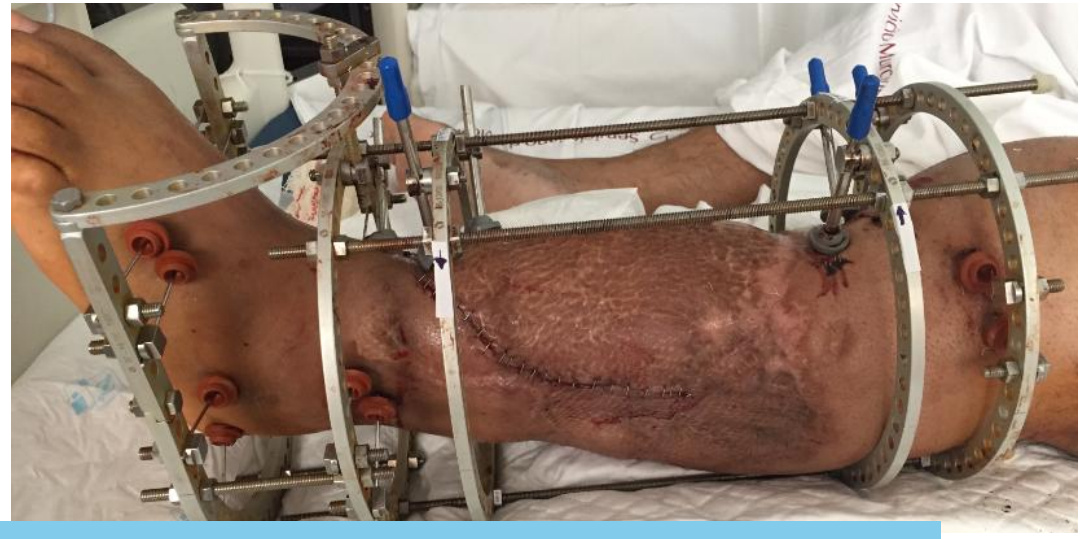




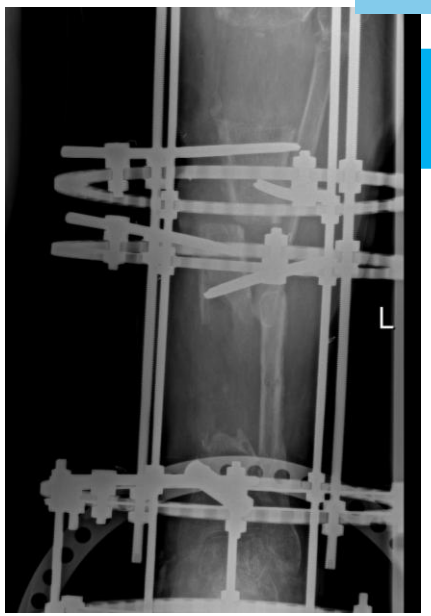
EVOLUZIONE RADIOLOGICA FAVOREVOLE

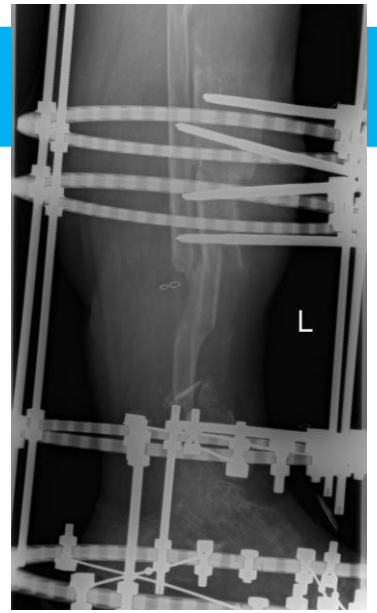


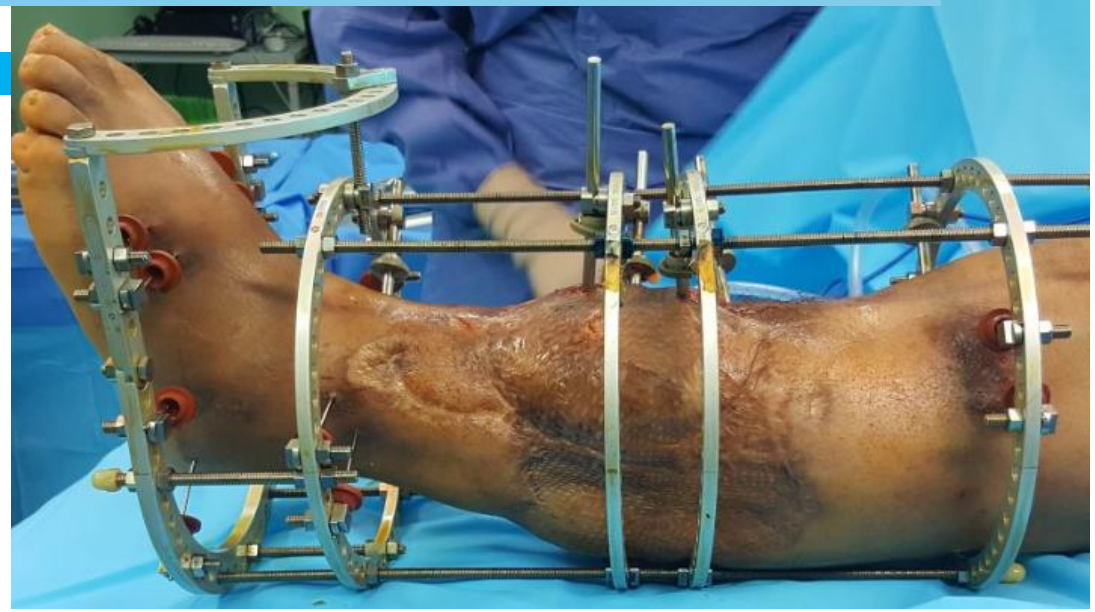


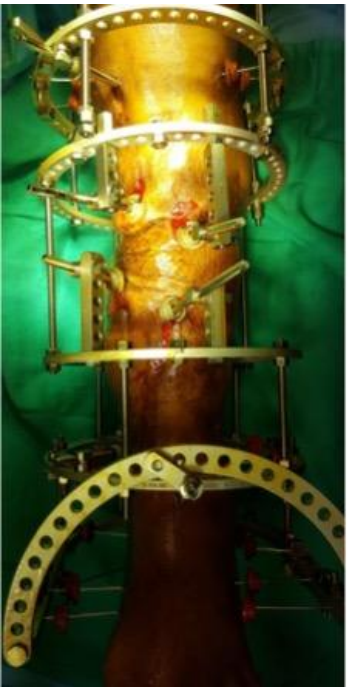


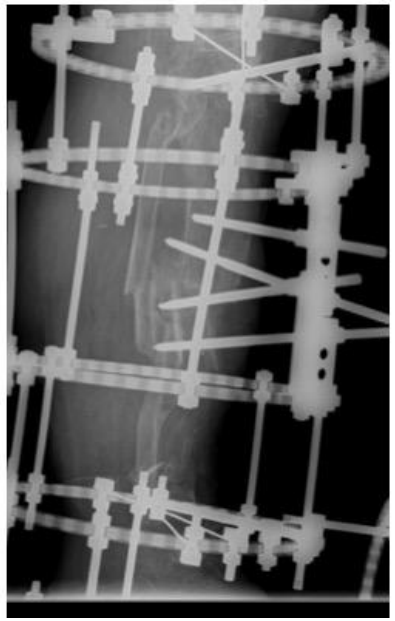
A 4 MESI SI OSSERVA L'AGGANCIO OSSEO.

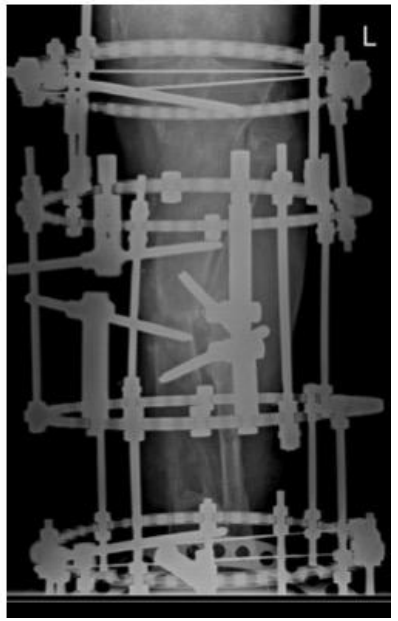




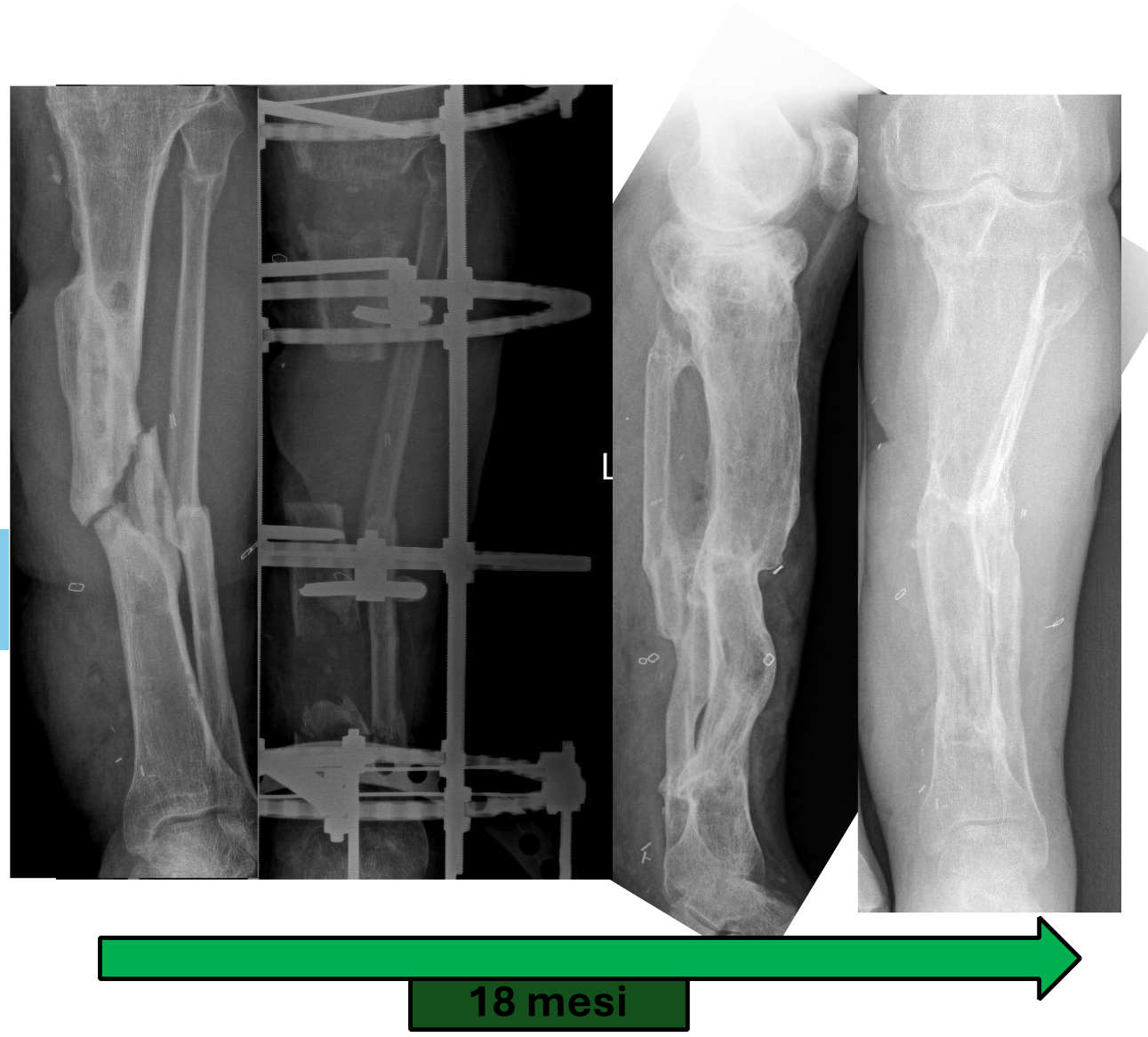






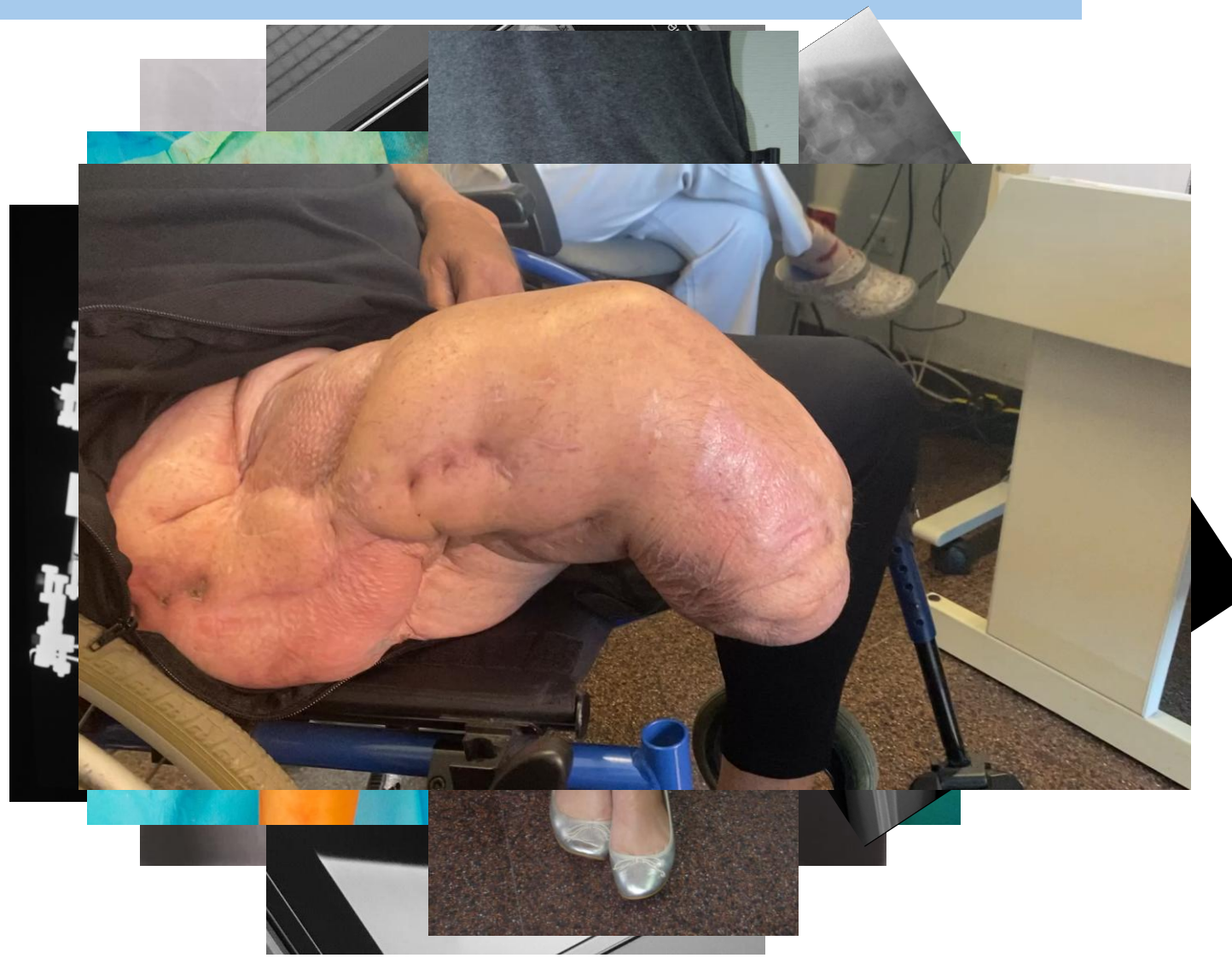


RIESAME DEL PUNTO DI ATTRACCO E CONTRIBUTO DELL'INNESTO AUTOLOGO



CONCLUSIONI
VANTAGGI DELLE TECNICHE FEXT IN PSEUDOARTROSI SETTICA

1. MINIMAMENTE INVASIVO, RISPETTO PER LA BIOLOGIA
2. PROMUOVE LA GENERAZIONE DI TESSUTO OSSEO (OSTEOGENESI)
3. PROMUOVE LA GENERAZIONE MICROVASCOLARE (ISTOGENESI)
4. CONSENTE LA CORREZIONE E L'ALLUNGAMENTO SIMULTANEI DELLA DEFORMITÀ
5. CARICO PESO IMMEDIATO
6. MOBILIZZAZIONE ARTICOLARE PRECOCE




SESSIONE CONGIUNTA
ITALIA-SPAGNA


SIFE
SOCIETÀ ITALIANA
FISSAZIONE ESTERNA
CONGRESSO NAZIONALE
SOCIETÀ ITALIANA
FISSAZIONE ESTERNA
Fissazione esterna nel
trattamento delle emergenze
e traumi militari, tecniche
di ricostruzione degli arti
e trattamento degli esiti
postraumatici
2025
ROMA
16-17 MAGGIO 2025


grazie mille!