

CONGRESSO NAZIONALE SOCIETÀ ITALIANA FISSAZIONE ESTERNA

Fissazione esterna nel trattamento
delle emergenze e traumi militari,
tecniche di ricostruzione degli arti e
trattamento degli esiti posttraumatici

ROMA

2025

16-17 MAGGIO 2025



ALLUNGAMENTO DEGLI ARTI INFERIORI E CORREZIONE DELLE DEFORMITÀ CON FISSATORE ESAPODALICO IN UN CASO DI NANISMO ACONDROPLASICO: IL PLANNING SOFTWARE ASSISTITO

M. Ilardo, G. Testa, M. Marchetti, E. Russo, M. Sapienza, V. Pavone

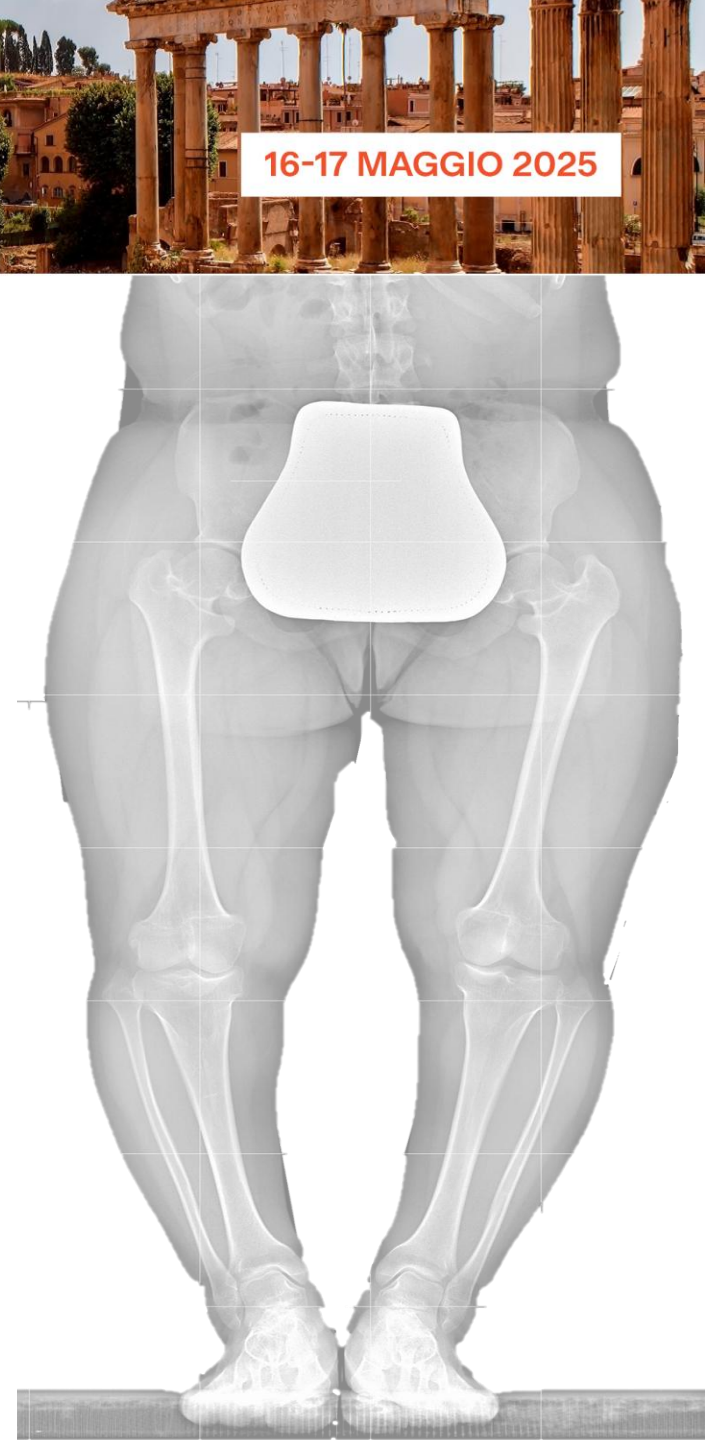
Prof. **Gianluca Testa**

Professore associato

Università degli Studi di Catania

Clinica Ortopedica e Traumatologica

A.O.U. Policlinico Rodolico – San Marco

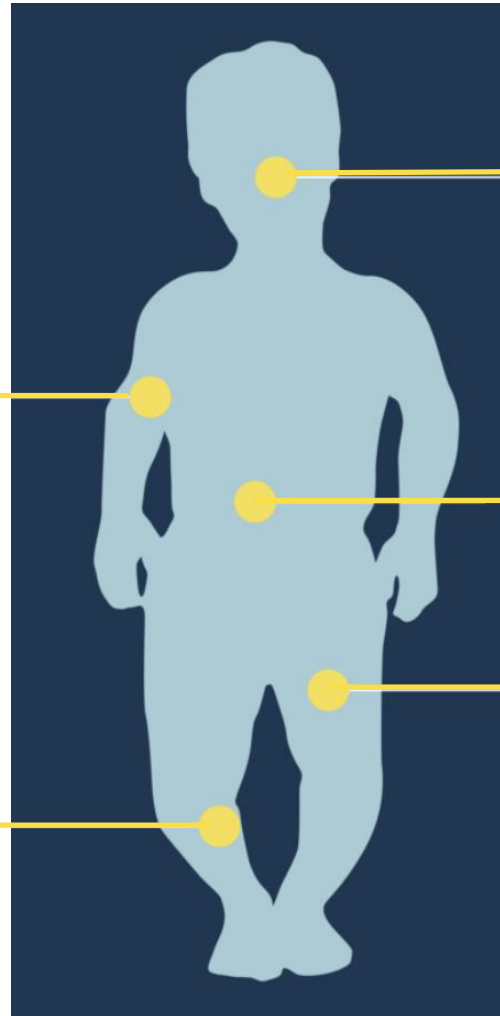


ACONDROPLASIA

FGFR3

Accorciamento degli arti con rizomielia, mano a tridente, ossa lunghe brevi, metafisi slargate

Ginocchio varo



Macrocefalia, fronte prominente, ipoplasia medio-facciale

Tronco corto, ipercifosi, iperlordosi

Bassa statura disarmonica

M=132cm
F=124 cm

OBIETTIVI ALLUNGAMENTO

- Limitare le complicanze
- Ridurre i tempi di trattamento
- Ritorno precoce alle attività
- Risparmiare la cartilagine di accrescimento per consentire la crescita residua

Mindler, G.T., Stauffer, A. & Ganger, R. Leg lengthening and deformity correction in rare bone diseases: a multidisciplinary approach. *Wien Med Wochenschr* **171**, 126–132 (2021). <https://doi.org/10.1007/s10354-020-00805-7>

Ray, Victor et al. "Simultaneous multisegmental and multifocal corrections of complex lower limb deformities with a hexapod external fixator." *Orthopaedics & traumatology, surgery & research : OTSR* vol. 109,3 (2023): 103042. doi:10.1016/j.otsr.2021.103042



F, 17 anni (2006)
122 cm



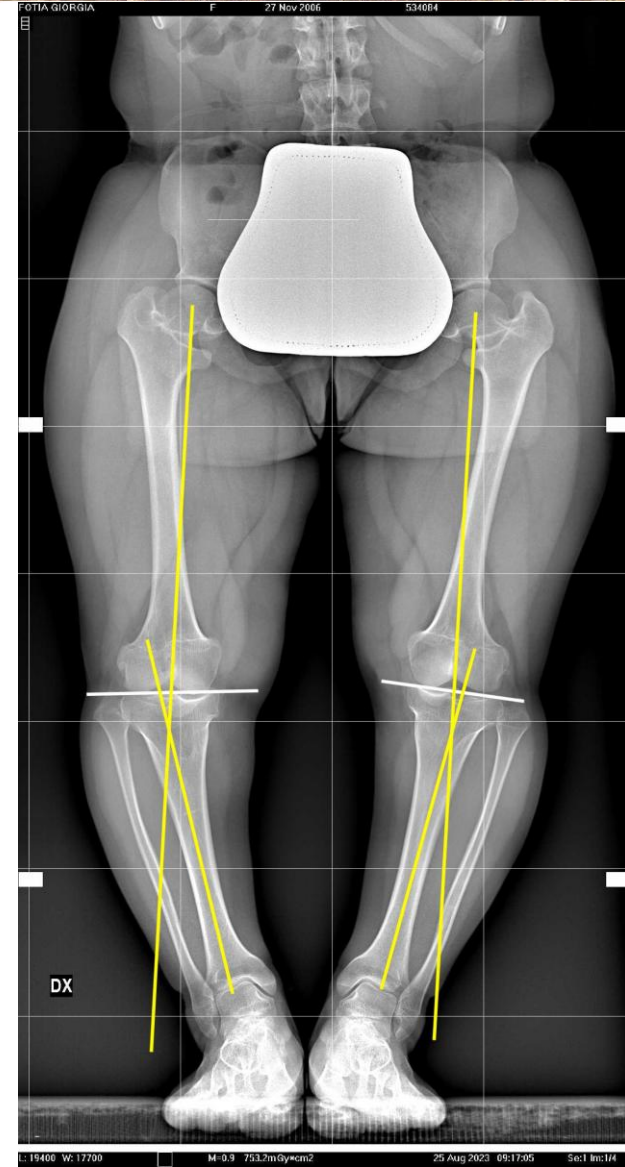
**RX SOTTO
CARICO**





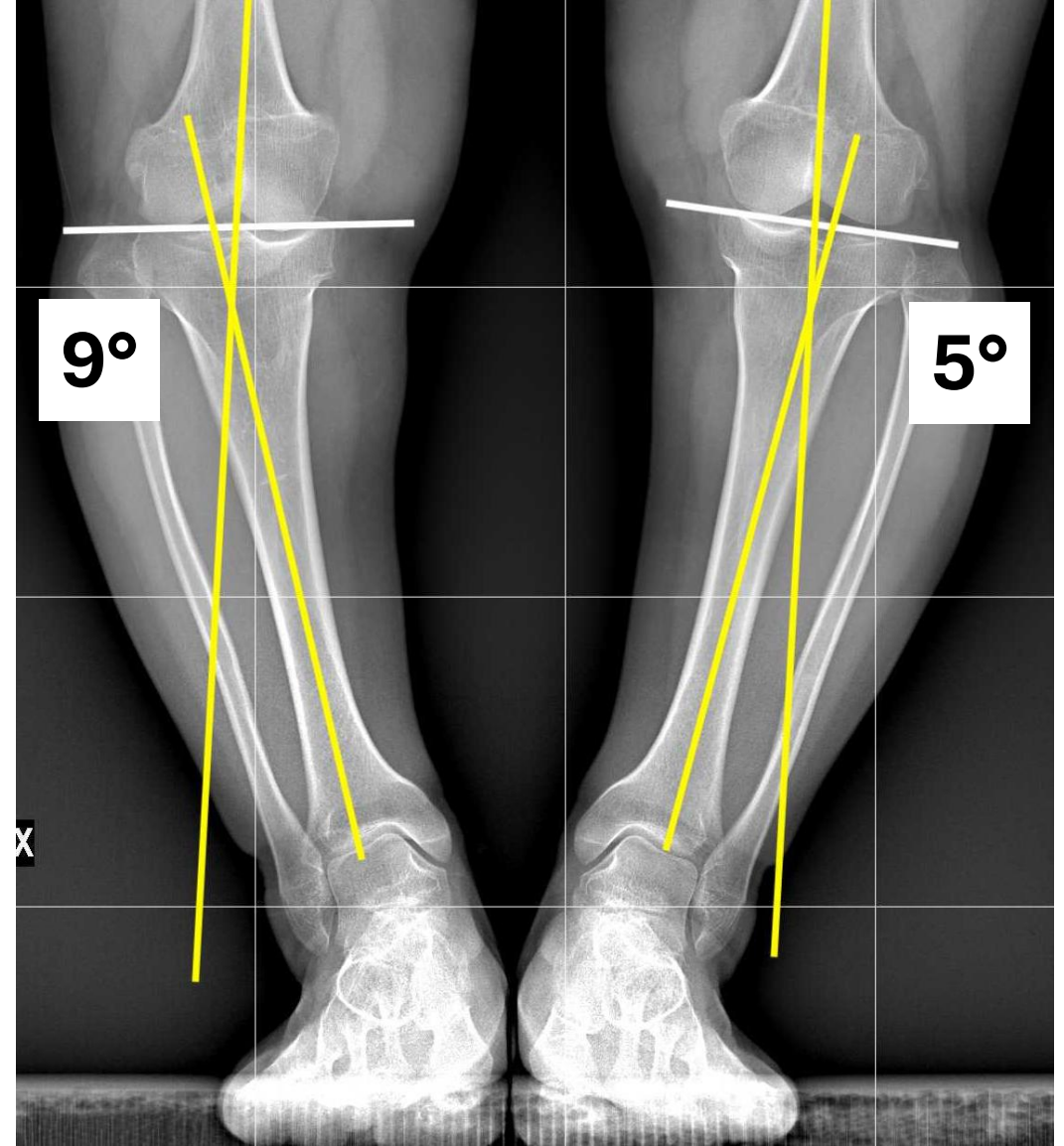
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IL PLANNING:



IL PLANNING:

- IDENTIFICAZIONE DEL CORA
- PIANIFICAZIONE DEL SITO DI OSTEOTOMIA
- GRADO DI VARISMO





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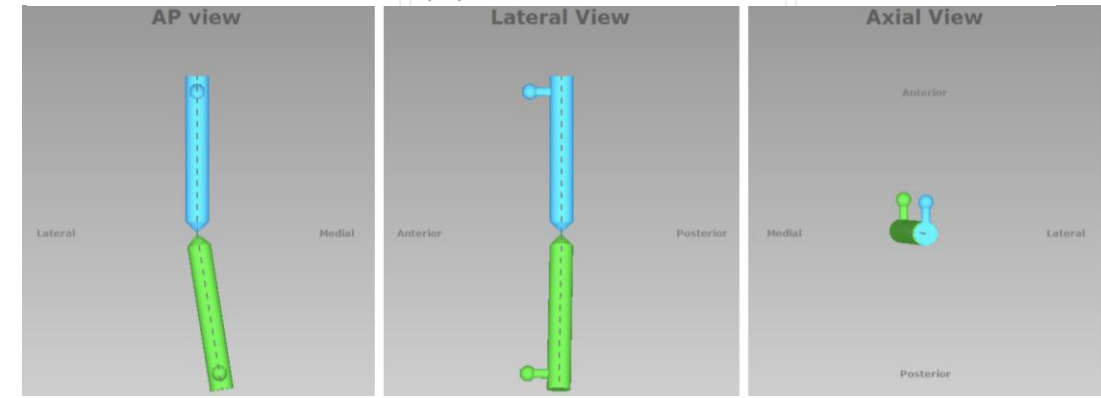
AP View Angular Deformity (deg)	9 (Varus)	Lateral View Angular Deformity (deg)	1 (Recurvatum)
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AP View Translation (mm)	0	Lateral View Translation (mm)	0
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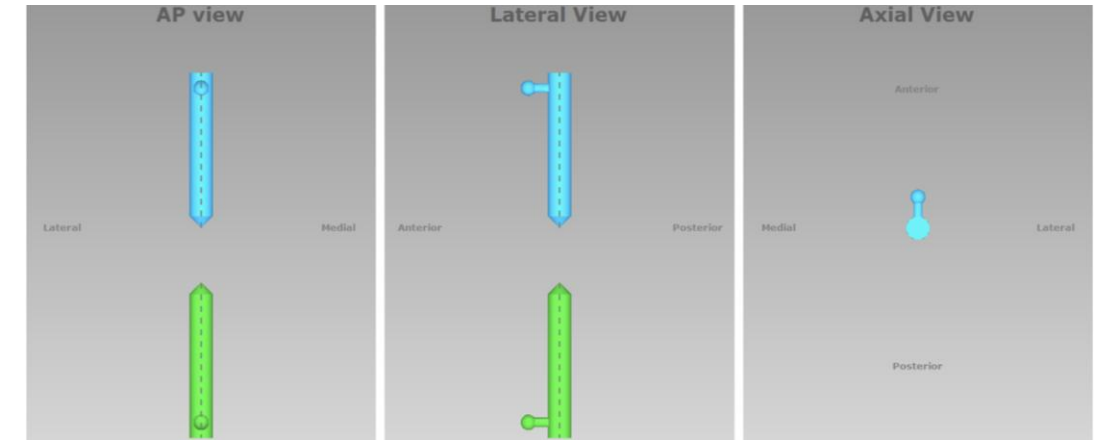
Axial View Rotation (deg)	0
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Axial View Translation (mm)	0
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Varismo 9°
Recurvato 1°

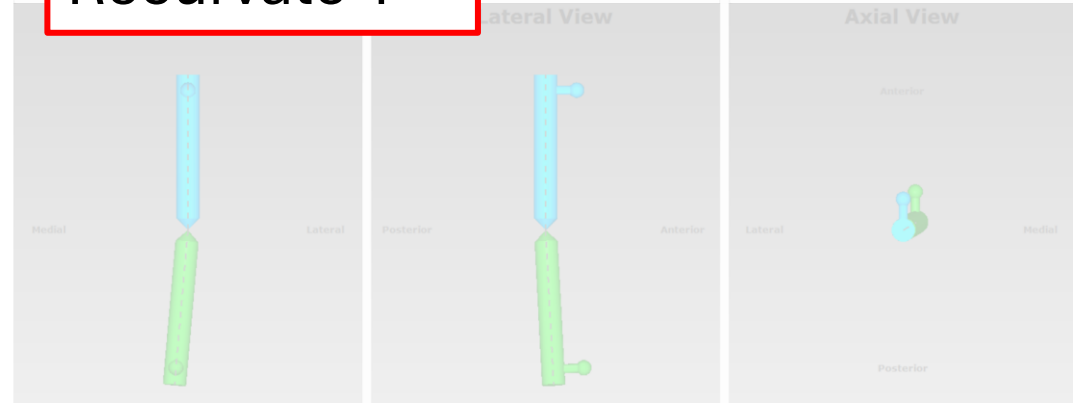


AP View Over Angulation (deg)	0	Lateral View Over Angulation (deg)	0	Axial View Over Rotation (deg)	0
AP View Over Translation (mm)	0	Lateral View Over Translation (mm)	0	Axial View Bone Length (mm)	70 (Lengthening)

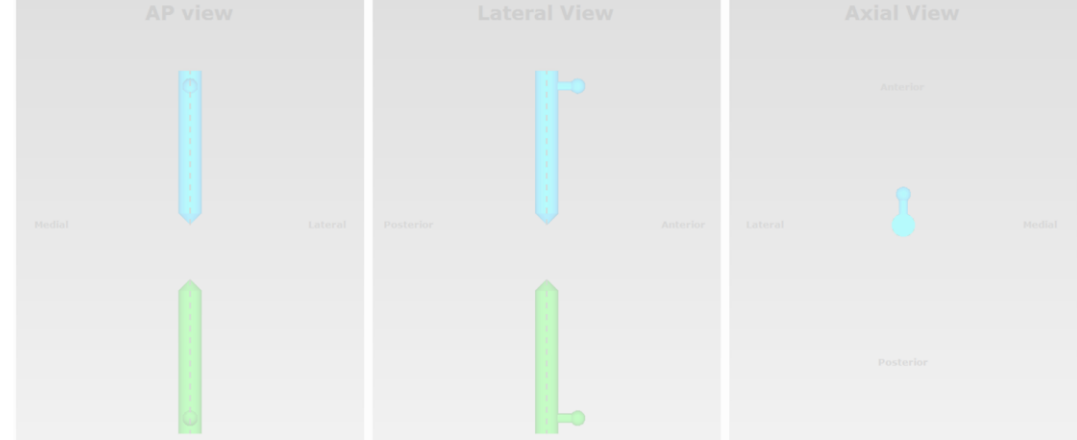


AP View Angular Deformity (deg)	3 (Recurvatum)	Axial View Rotation (deg)	0
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AP View Translation (mm)	0	Axial View Translation (mm)	0 (Long)
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AP View Over Angulation (deg)	0	Lateral View Over Angulation (deg)	0	Axial View Over Rotation (deg)	0
AP View Over Translation (mm)	0	Lateral View Over Translation (mm)	0	Axial View Bone Length (mm)	70 (Lengthening)



R

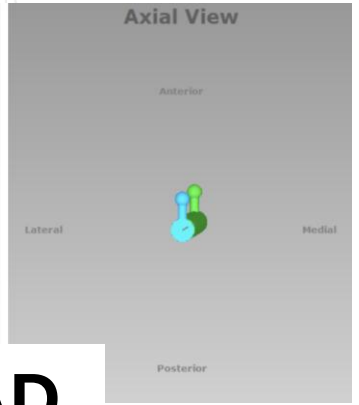
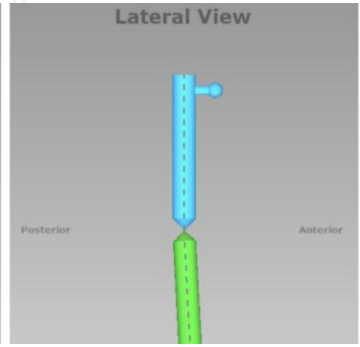
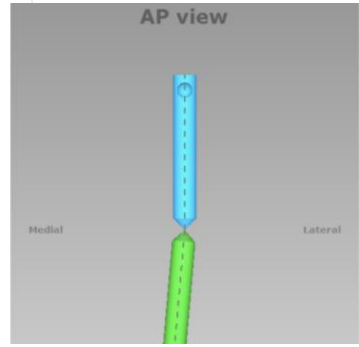
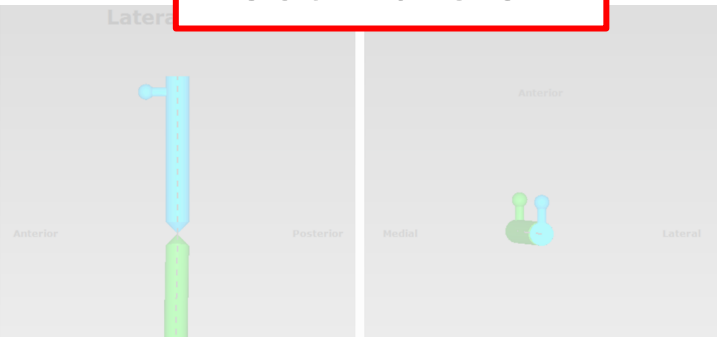
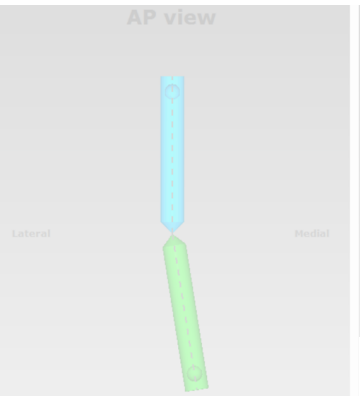
L



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Varismo 5°
Recurvato 3°

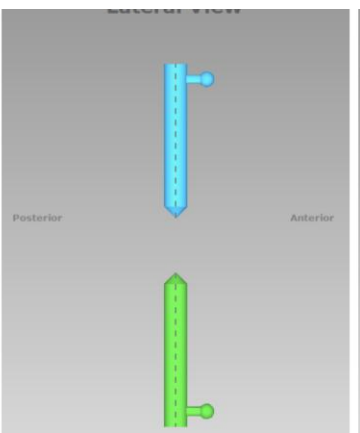
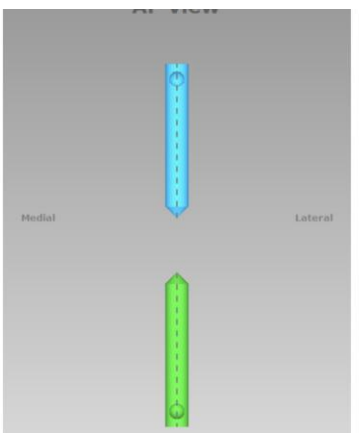
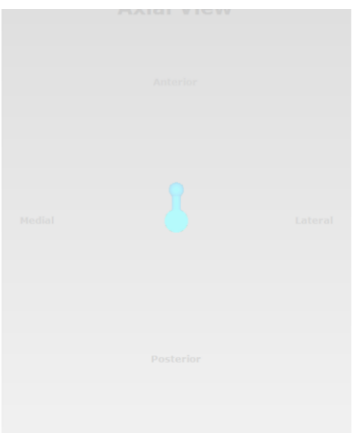
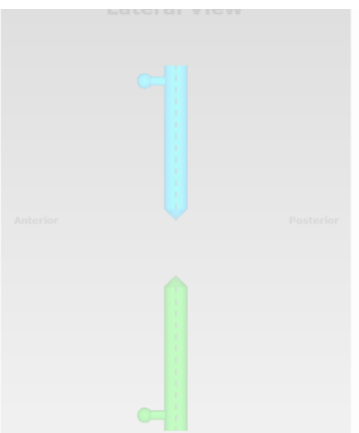
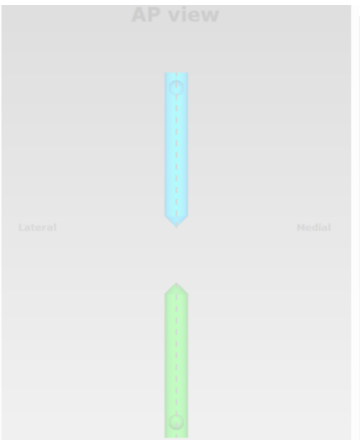
AP View Angular Deformity (deg)	5 (Varus)	Lateral View Angular Deformity (deg)	3 (Recurvatum)	Axial View Rotation (deg)	0
AP View Translation (mm)	0	Lateral View Translation (mm)	0	Axial View Translation (mm)	0 (Long)



AP View Over Angulation (deg)	0
AP View Over Translation (mm)	0

CORREZIONE GRADUALE DELLE DEFORMITA' AD UN RITMO IMPOSTATO DI 1mm AL GIORNO

er Rotation	0
ne Length	70 (Lengthening)



R

L

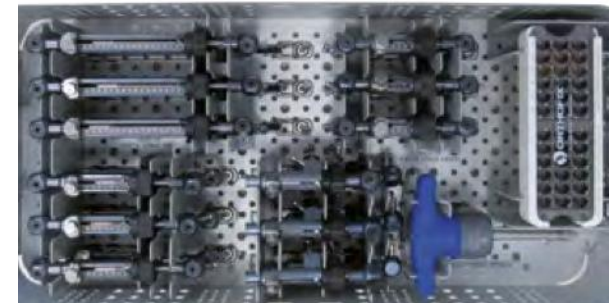
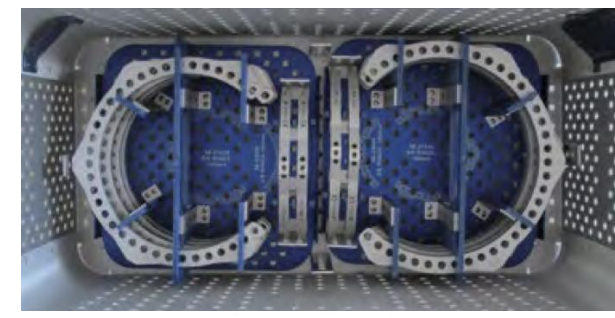
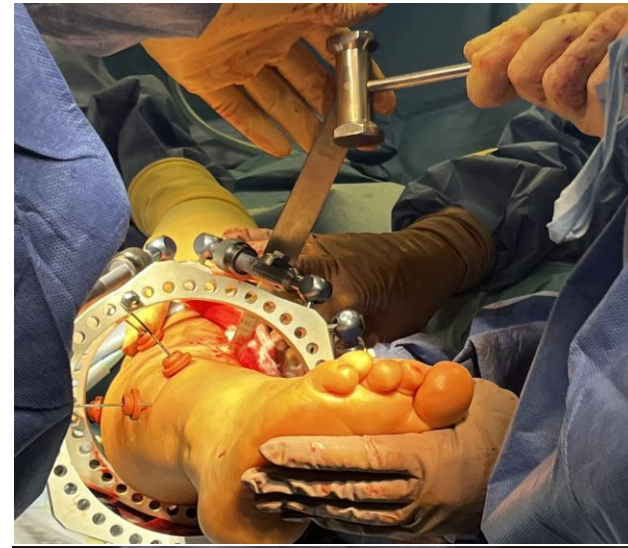
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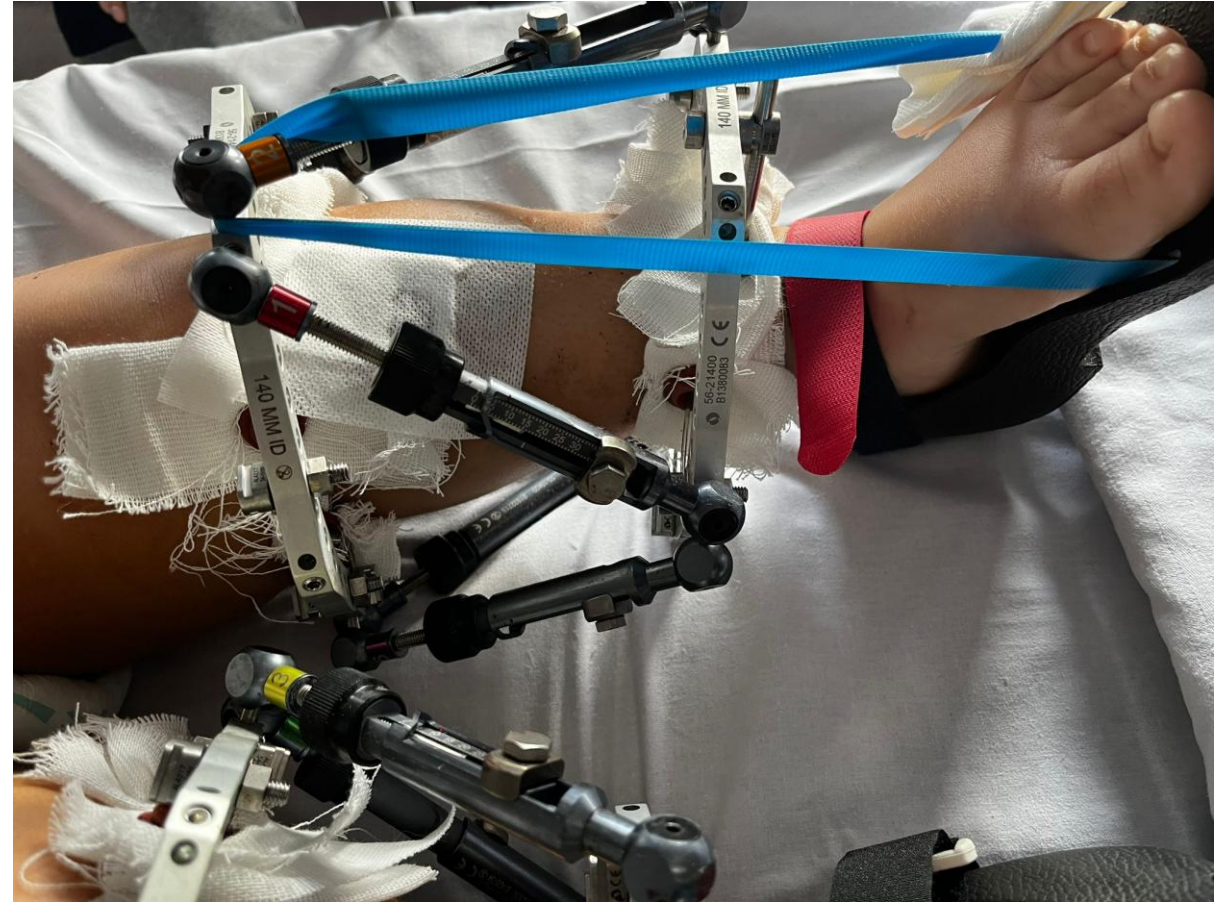


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J Orthop Sci (2011) 16:756–759
DOI 10.1007/s00776-011-0139-y

ORIGINAL ARTICLE

Equinus deformity during tibial lengthening with ankle orthoses for equalization of leg-length discrepancies



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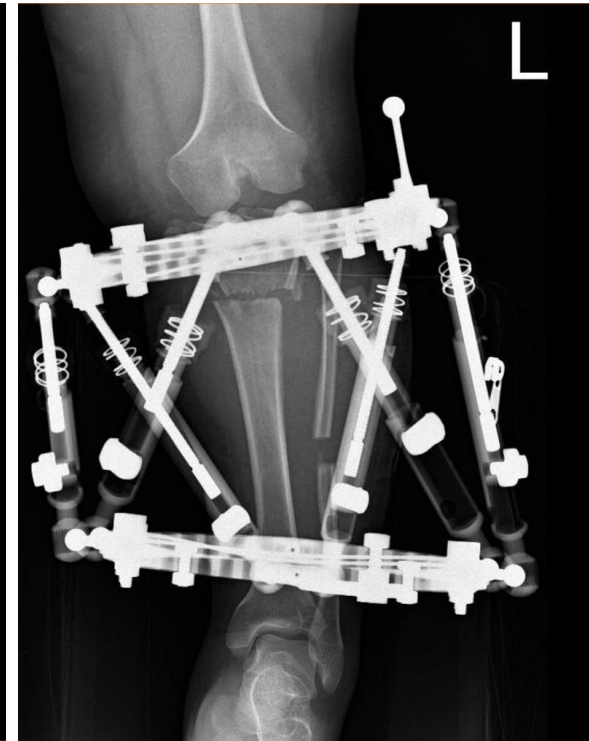
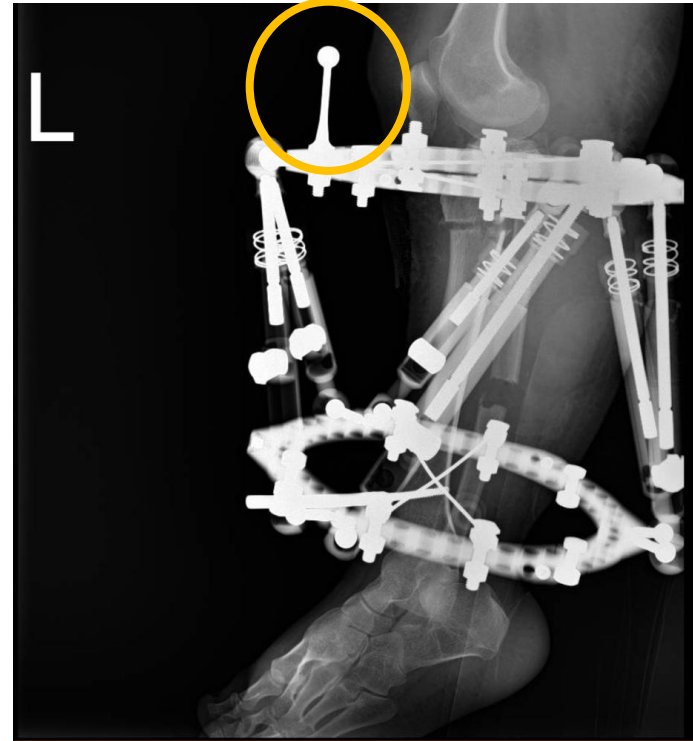
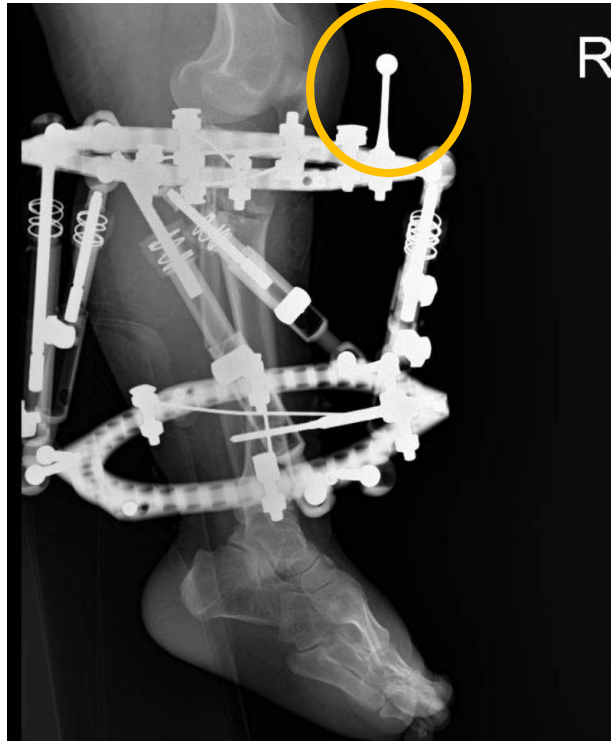
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RXGRAFIE POST OPERATORIE

CENTERING PIN





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Scenario * ?

○ PREOPERATIVE

● POSTOPERATIVE

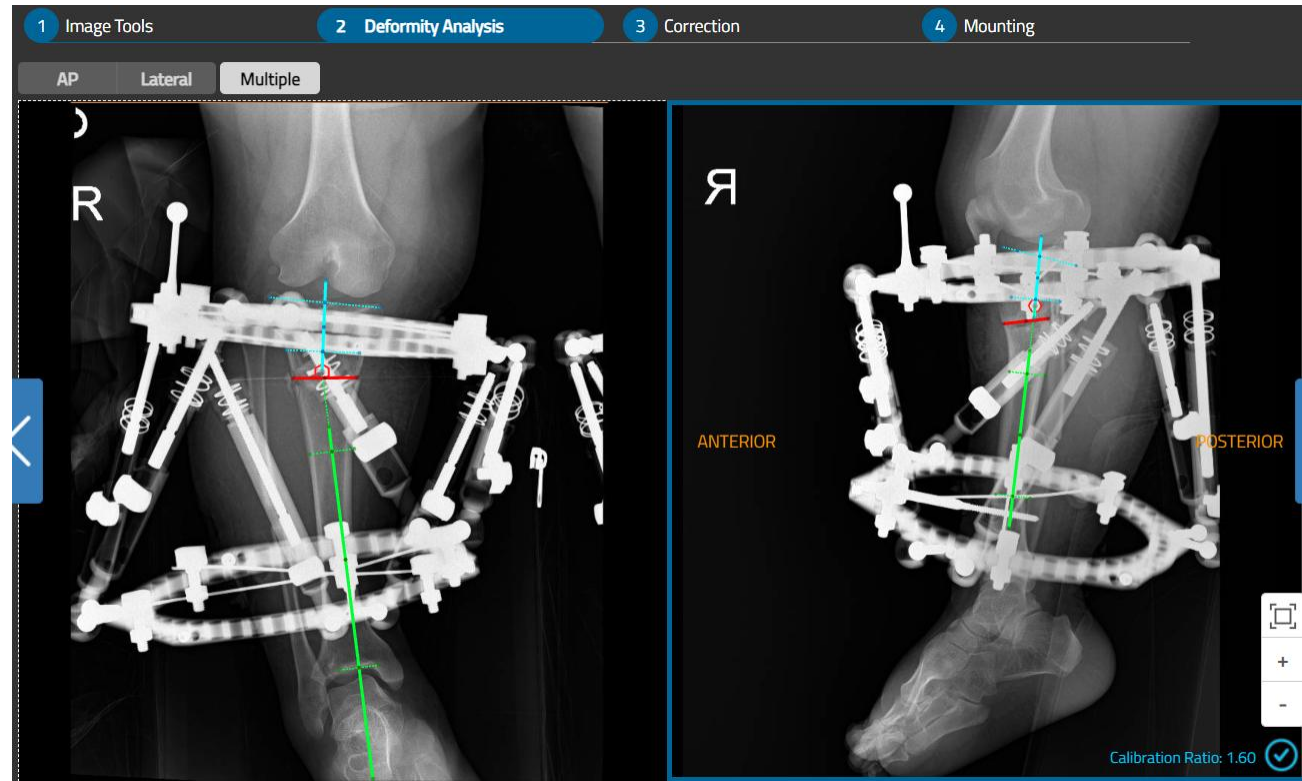
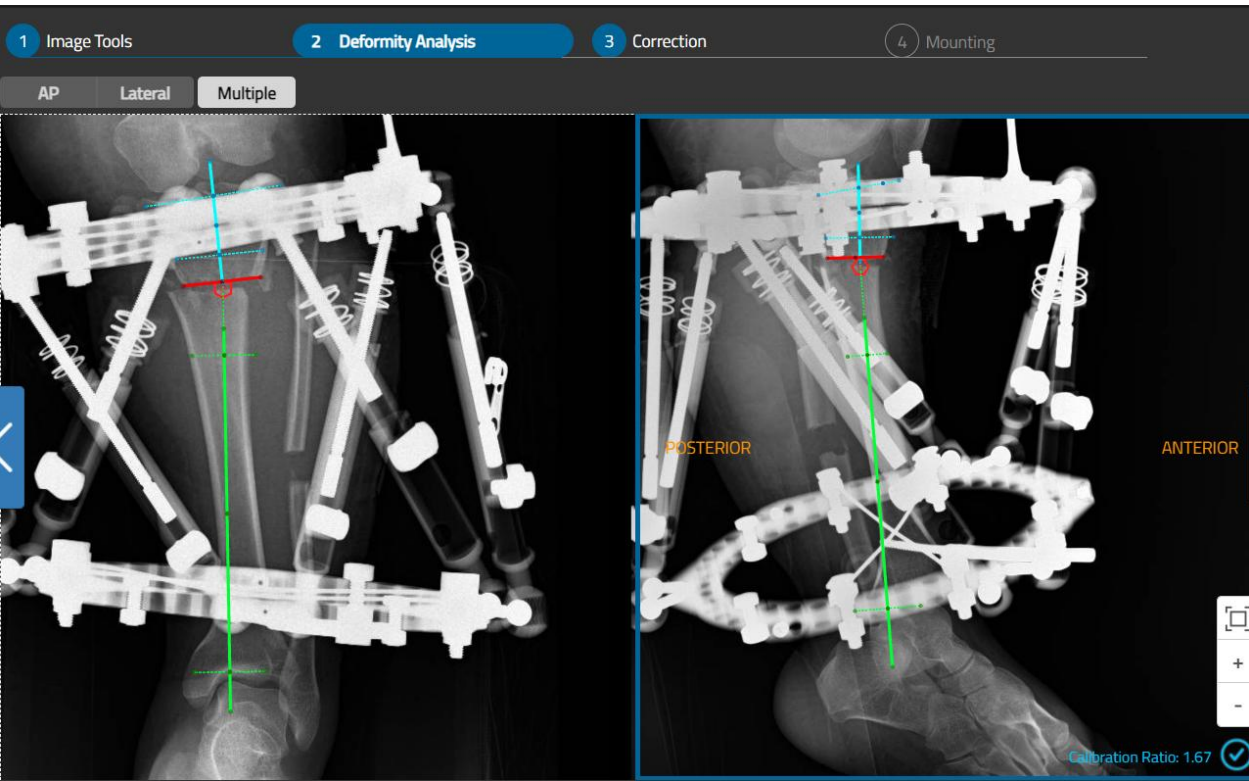
Proximal Support * ?

Full Ring (5/8 plus 3/8) - 140mm ▾

Distal Support * ?

Full Ring (5/8 plus 3/8) - 140mm ▾

PLANNING POST-OPERATORIO





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Insert Strut lengths

Total (mm)

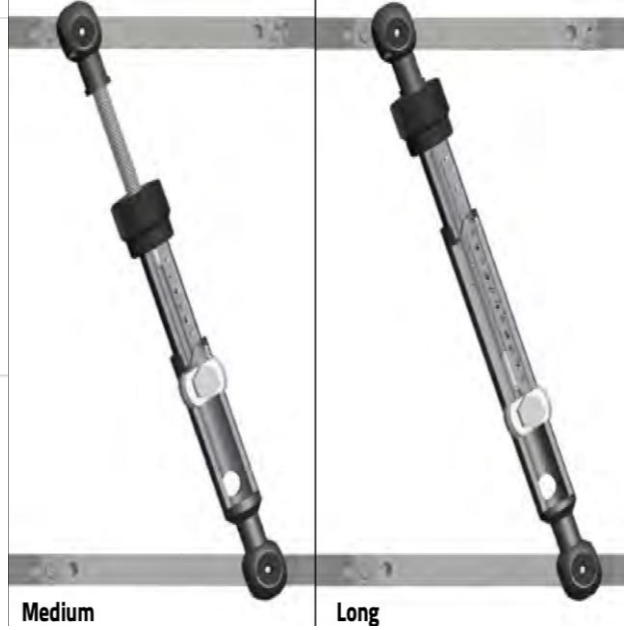
Size

Acute

Gradual

Select Size
 UltraShort
 Short
✓ Medium
 Long

	Strut 2: 0	Strut 3: 0	Strut 4: 0	Strut 5: 0	Strut 6: 0
Select Size	Select Size	Long	Long	Long	Medium
Acute	35	23	13	2	6
Gradual	17	20	75	73	67



Case Data Deformity Parameters Mounting Parameters **Schedule** Report

Surgery Date *

Latency Period (days) *

Correction Time(s) *

00:00	01:00	02:00	03:00	04:00	05:00
06:00	07:00	08:00	09:00	10:00	11:00
12:00	13:00	14:00	15:00	16:00	17:00
18:00	19:00	20:00	21:00	22:00	23:00

Prescription Notes

0/250

Apply Lengthening/Shortening First

Calculate By *

✓ Daily Correction Rate (mm/day)

Days of Correction

Calculate

Schedule

Surgery Date : 05/12/2023

Latency Period (days) : 2

Treatment Start Date : 07/12/2023

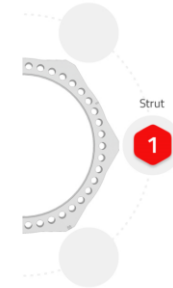
Correction Time(s): 10:00, 20:00

Calculation Results

Daily Correction Rate (mm/day)	1,0
Angular Max Speed (deg/day)	0,1
Rotate Max Speed (deg/day)	0,0
Days Of Correction	71

No	Day	Date-Time	1 : Red			2 : Orange			3 : Yellow			4 : Green			5 : Blue			6 : Purple								
			Size	A	G	Click	Size	A	G	Click	Size	A	G	Click	Size	A	G	Click	Size	A	G	Click				
1	gio	07/12/2023 10:00	Medium	8	17	1	Medium	35	20	1	Long	23	75	1	Long	13	73	1	Long	2	67	1	Medium	6	19	1
2	gio	07/12/2023 20:00	Medium	8	16	1	Medium	35	19	1	Long	23	75	0	Long	13	73	0	Long	2	66	1	Medium	6	19	0
3	ven	08/12/2023 10:00	Medium	8	16	1	Medium	35	19	1	Long	23	74	1	Long	13	72	1	Long	2	66	1	Medium	6	18	1
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No	Day	Date-Time	1 Red	2 Orange	3 Yellow	4 Green	5 Blue	6 Purple	
1	gio	07/12/2023 10:00	1	1	1	1	1	1	☐
2	gio	07/12/2023 20:00	1	1	0	0	1	0	☐
3	ven	08/12/2023 10:00	1	1	1	1	1	1	☐
4	ven	08/12/2023 20:00	0	1	1	1	0	1	☐
5	sab	09/12/2023 10:00	2	1	1	1	1	1	☐
6	sab	09/12/2023 20:00	0	0	0	1	1	1	☐
7	dom	10/12/2023 10:00	1	2	1	1	1	1	☐
8	dom	10/12/2023 20:00	1	0	1	0	1	1	☐
9	lun	11/12/2023 10:00	1	1	0	1	1	1	☐
10	lun	11/12/2023 20:00	1	1	1	1	1	1	☐
11	mar	12/12/2023 10:00	1	1	1	1	1	1	☐
12	mar	12/12/2023 20:00	1	1	0	0	1	0	☐



È ora di regolare le aste telescopiche micrometriche 10 AM





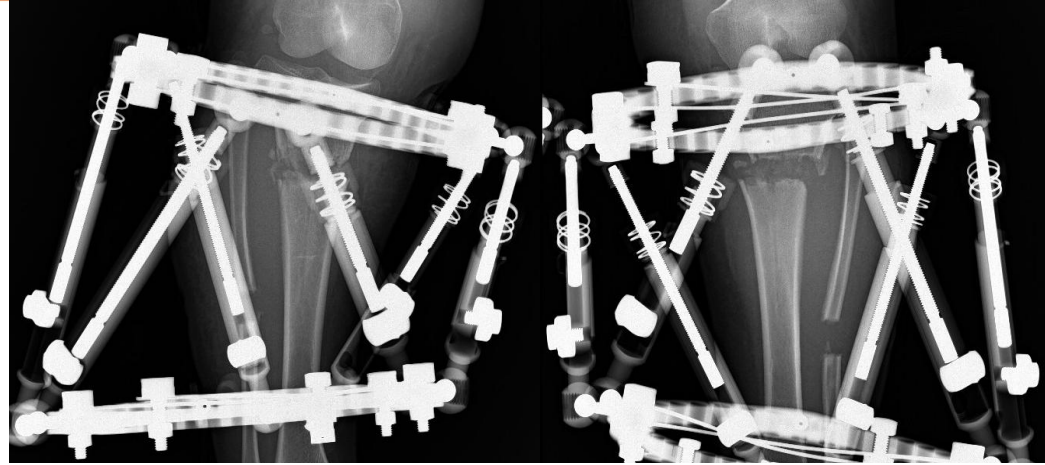
Periodiche sostituzioni delle barre come da programma

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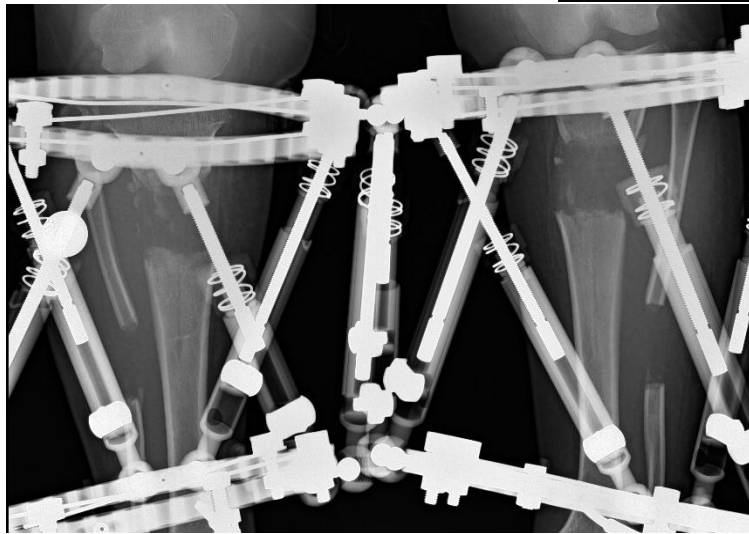




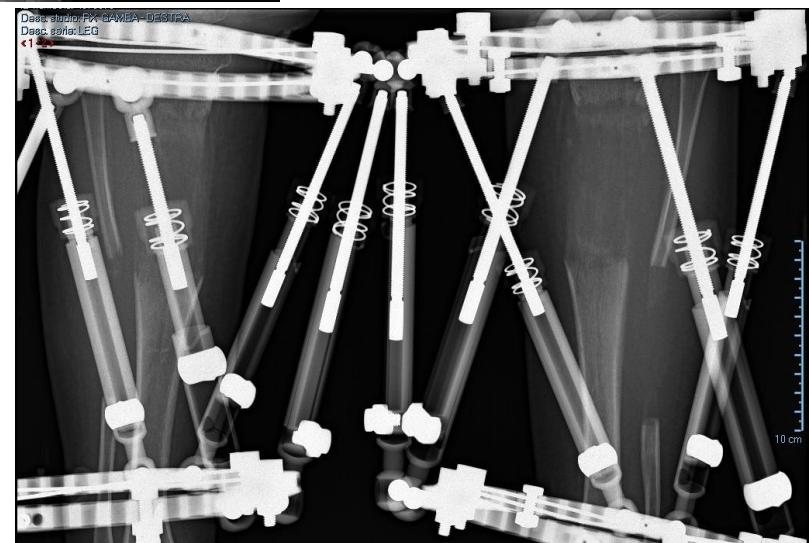
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8 giorni



1 mese



3 mesi

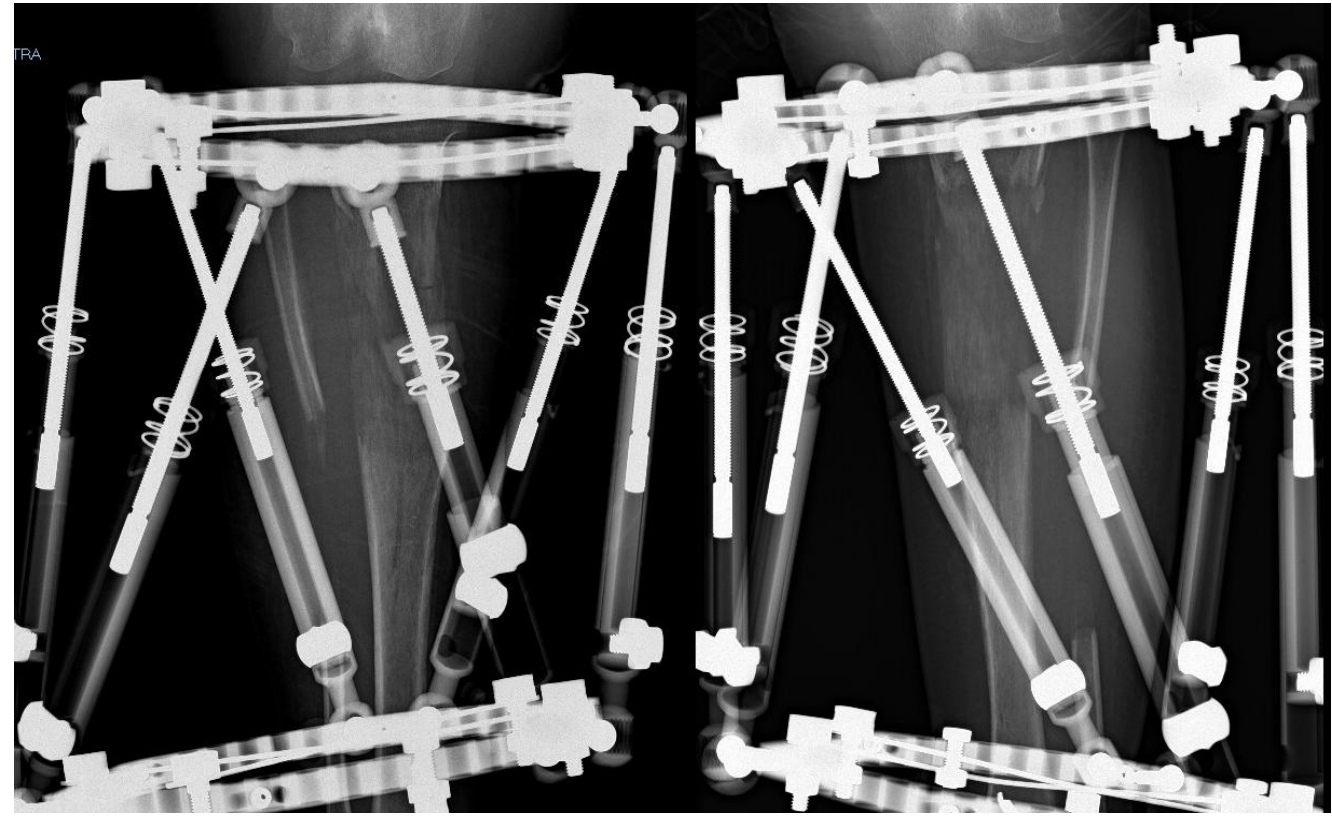
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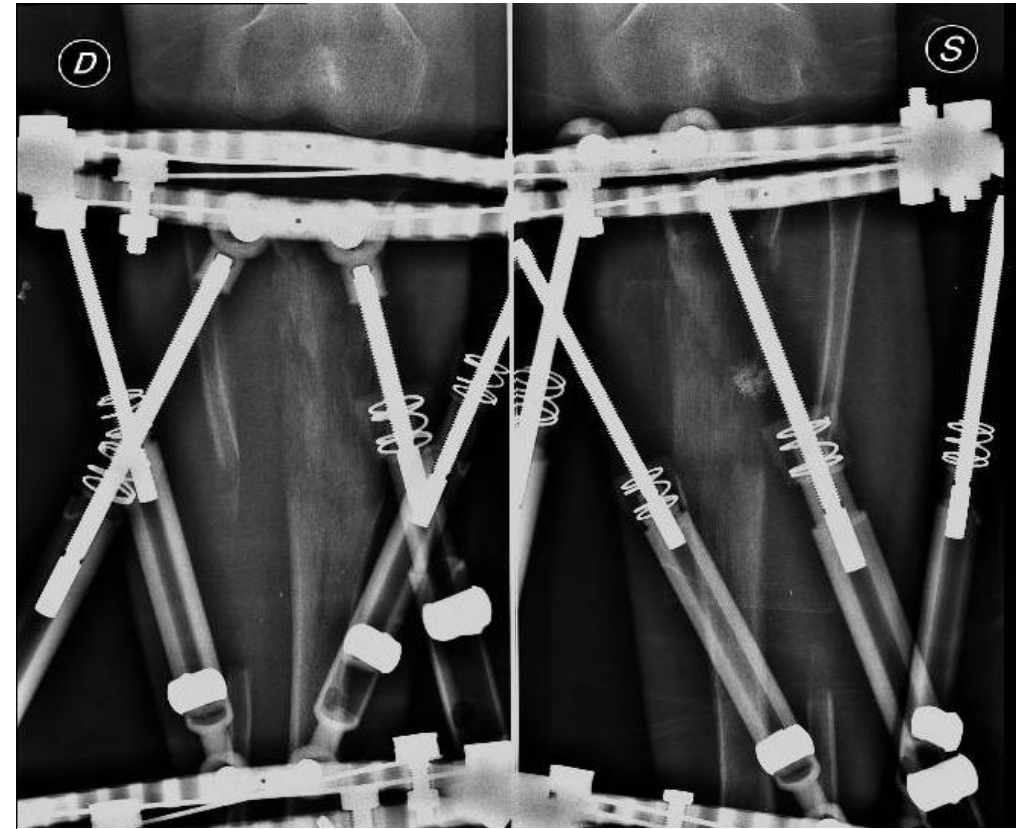
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4 mesi



5 mesi

+8.5 cm

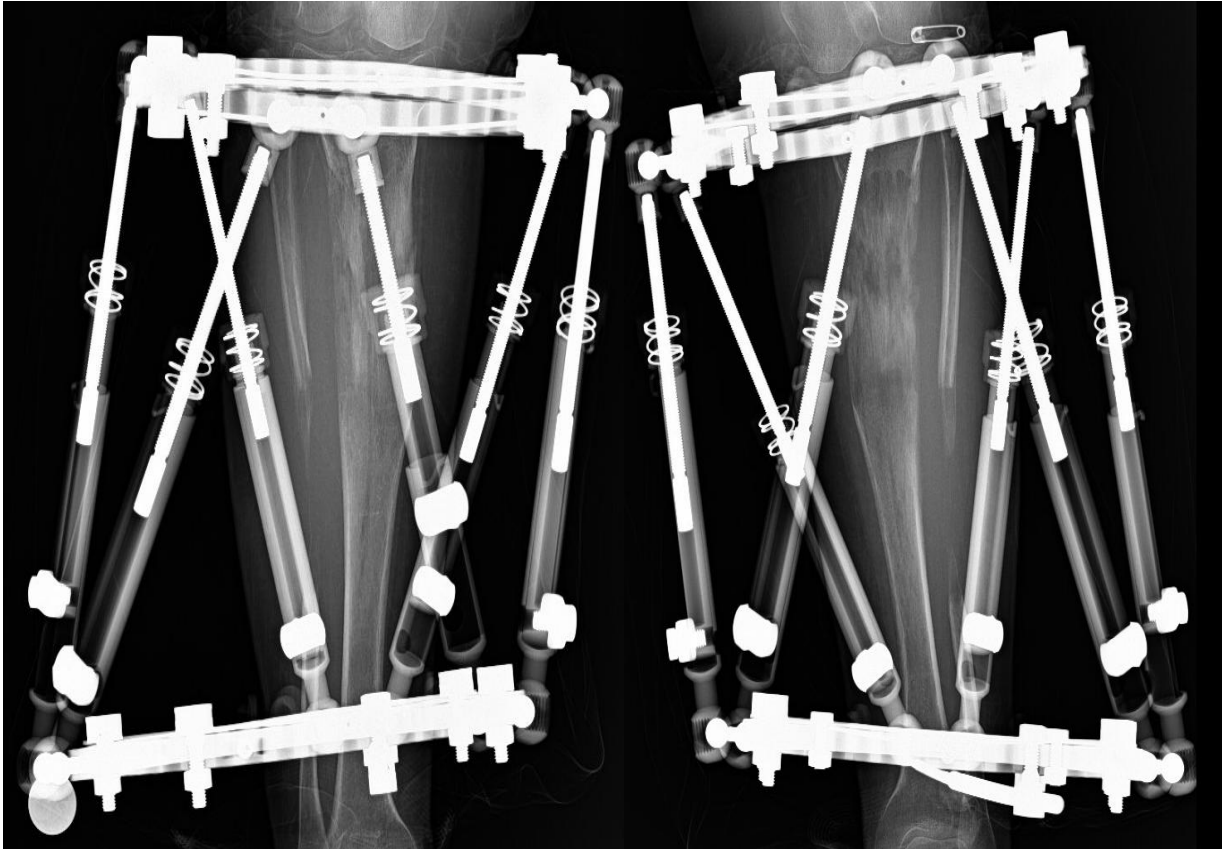
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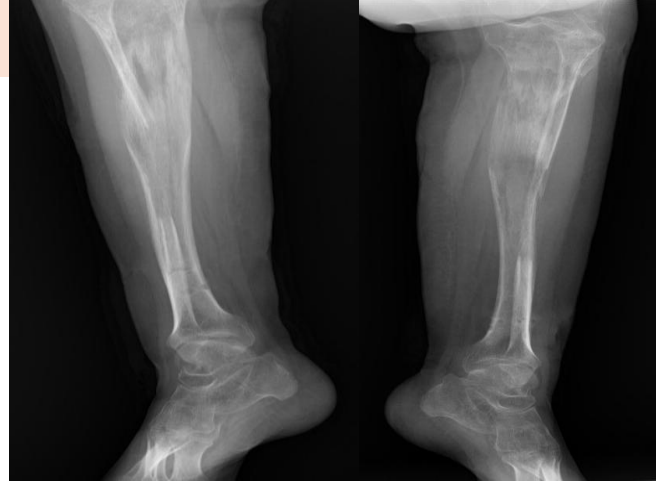
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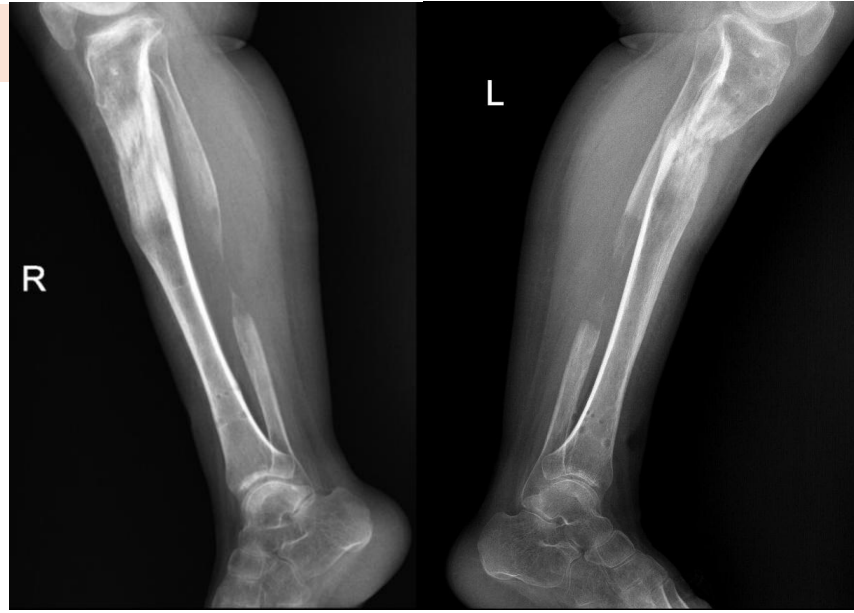


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Post rimozione



1 mese



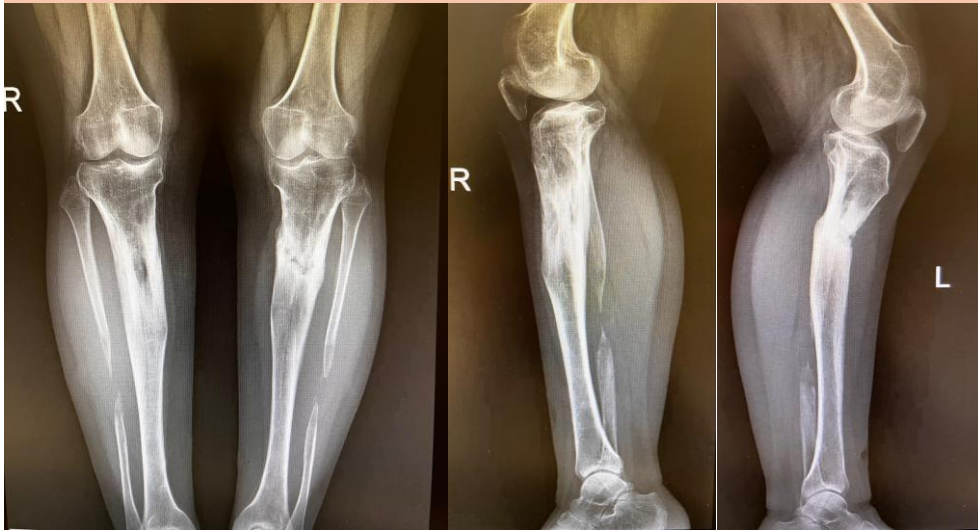


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3 mesi post op



6 mesi post op



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TERAPIA FISICA

CEMP
CAMPI ELETTROMAGNETICI PULSATI
8h/die per 30 giorni





16-17 MAGGIO 2025

COMPLICANZE

INFEZIONE DEI TRAMITI

DOLORE

MOBILIZZAZIONE DELL'IMPIANTO

PSEUDOARTROSI

MANCATA FORMAZIONE DI RIGENERATO

STRESS MENTALE

RIGIDITÀ ARTICOLARE

Review > [J Orthop Traumatol.](#) 2020 Mar 5;21(1):3. doi: 10.1186/s10195-019-0541-3.

Limb lengthening history, evolution, complications and current concepts

[Gamal A Hosny](#)¹

> [Front Pediatr.](#) 2023 Nov 3;11:1281099. doi: 10.3389/fped.2023.1281099. eCollection 2023.

Results and complications of bilateral limb lengthening in achondroplasia: a retrospective analysis

[Fabio Verdoni](#)¹, [Riccardo Giorgino](#)^{1 2}, [Camilla Virgilio](#)³, [Alessandra Nannini](#)^{1 2},
[Marco Viganò](#)¹, [Domenico Curci](#)¹, [Giuseppe Michele Peretti](#)^{1 4}, [Laura Mangiavini](#)^{1 4}

Our study also demonstrated that each week of EF placement is associated with a 4.7% increase in the risk of developing complications. Therefore, the duration of EF treatment should be sufficient to ensure satisfactory lengthening and good-quality bone regenerate. At the same time, external fixation should not be excessively prolonged to avoid further complications. Thus, in

IRRITAZIONE DEI TRAMITI

DOLORE



> [World J Orthop.](#) 2021 Nov 18;12(11):920-930. doi: 10.5312/wjo.v12.i11.920.

Role of coatings and materials of external fixation pins on the rates of pin tract infection: A systematic review and meta-analysis

Cristopher Stoffel ¹, Bruno Eltz ², Mauro José Salles ³

[Randomized Controlled Trial](#) > [J Trauma Nurs.](#) 2020 May/Jun;27(3):146-150.

doi: 10.1097/JTN.0000000000000503.

A Randomized Clinical Trial on the Use of Antiseptic Solutions for the Pin-Site Care of External Fixators: Chlorhexidine-Alcohol Versus Povidone-Iodine

María Sáenz-Jalón ¹, Carmen M Sarabia-Cobo, Elena Roscales Bartolome, Marta Santiago Fernández, Begoña Vélez, Mónica Escudero, M Eugenia Miguel, Patricia Artabe, Israel Cabañas, Antonio Fernández, Carlos Garcés, Jose Couceiro

[Review](#) > [Strategies Trauma Limb Reconstr.](#) 2022 May-Aug;17(2):93-104.

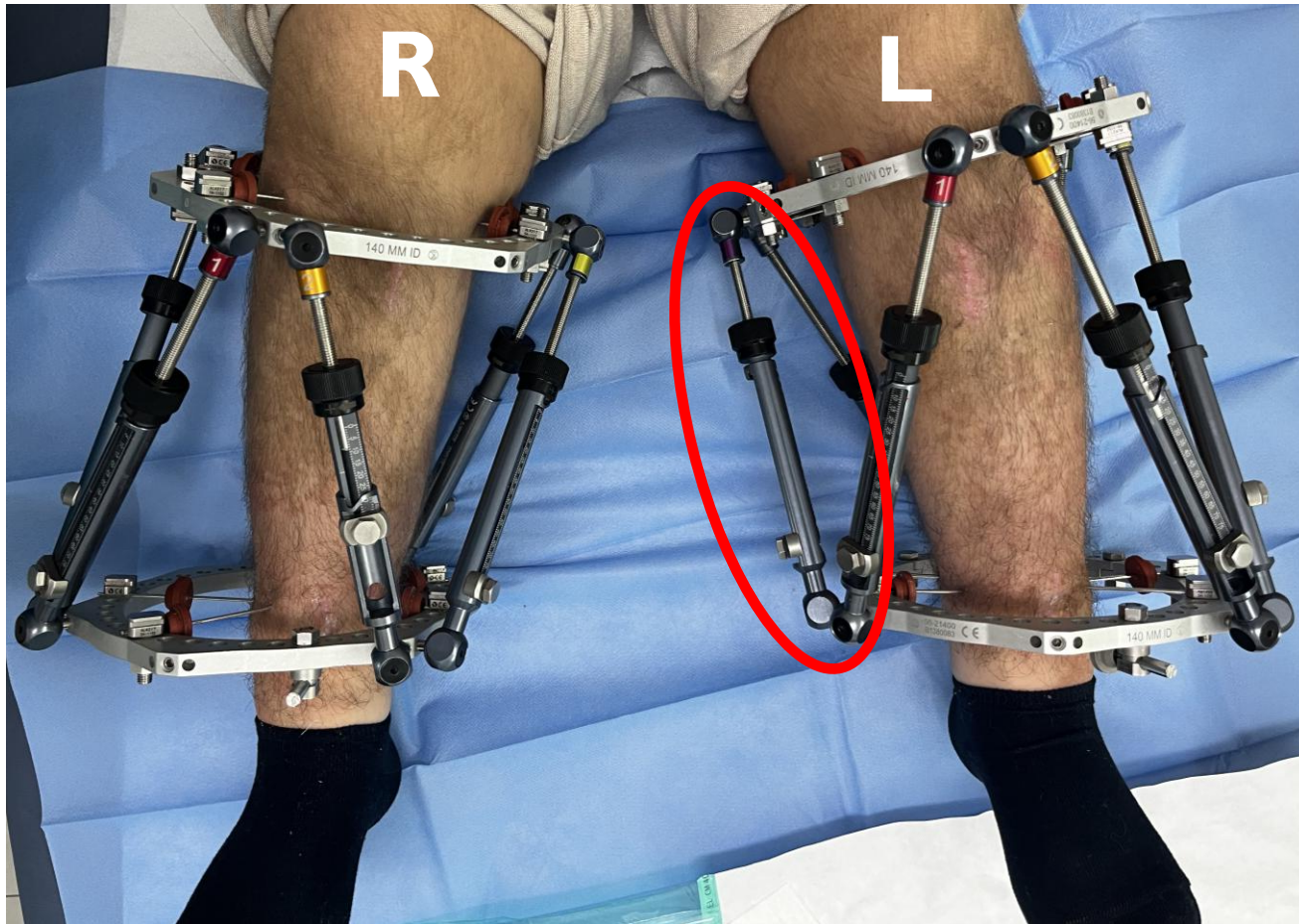
doi: 10.5005/jp-journals-10080-1562.

Pin-site Infection: A Systematic Review of Prevention Strategies

David W Shields ¹, Alexis-Dimitris Iliadis ², Erin Kelly ³, Nima Heidari ², Bilal Jamal ¹



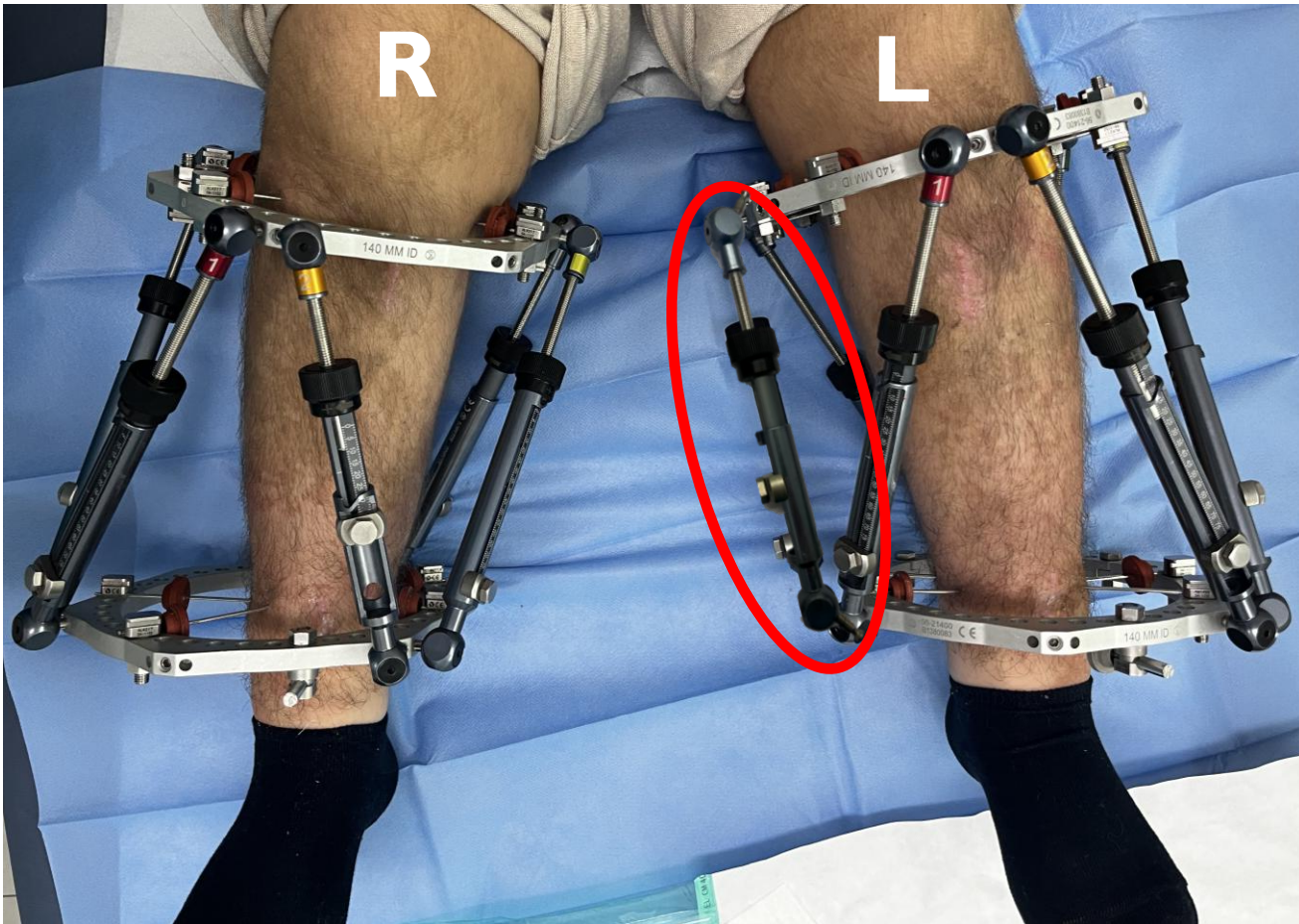
ALTERAZIONE DEL SISTEMA BARRE



- 1
- 2
- 3
- 4
- 5
- 6



16-17 MAGGIO 2025



No	Day	Date-Time	6 : Purple			
			Size	A	G	Click
52	lun	01/01/2024 20:00	Medium	35	25	1
53	mar	02/01/2024 10:00	Medium	35	24	1
54	mar	02/01/2024 20:00	Medium	35	24	0
55	mer	03/01/2024 10:00	Medium	35	23	2
56	mer	03/01/2024 20:00	Long	3	80	0

NUOVO PLANNING

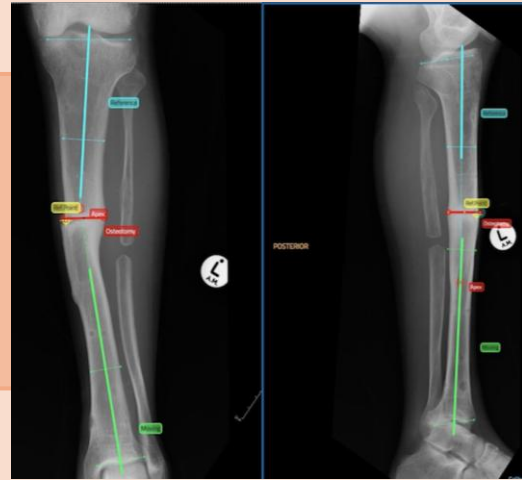
No	Day	Date-Time	6 : Purple			
			Size	A	G	Click
52	lun	01/01/2024 20:00	Medium	35	25	1
53	mar	02/01/2024 10:00	Medium	35	24	1
54	mar	02/01/2024 20:00	Medium	35	24	0
55	mer	03/01/2024 10:00	Medium	35	23	2
56	mer	03/01/2024 20:00	Medium	22	10	0



16-17 MAGGIO 2025

TAKE HOME MESSAGE

PLANNING
PRE E POST
OPERATORIO



SOFTWARE



TEAM
ESPERTO



Ti devo dire che non ho brutti ricordi fino ad adesso! Sono contenta anzi vado in ospedale con la nostalgia di quel periodo quando mi sono operata.. lo rifarei altre 1000 volte..

COMPLIANCE
E
MOTIVAZIONE



GRAZIE

Società Italiana di Ortopedia e Traumatologia Pediatrica

XXVII CONGRESSO NAZIONALE SITOP 2025

Con il patrocinio di

**Le fratture diafisarie in
traumatologia pediatrica**

**Le affezioni osteo-articolari e il
corretto timing: dall'età infantile alla
protesizzazione**

**Grand Hotel
Baia Verde**
Via Angelo Musco 8,
Aci Castello (Catania)

CATANIA
25 - 27 SETTEMBRE 2025