
# L’ambiente meccanico ideale per la consolidazione ossea

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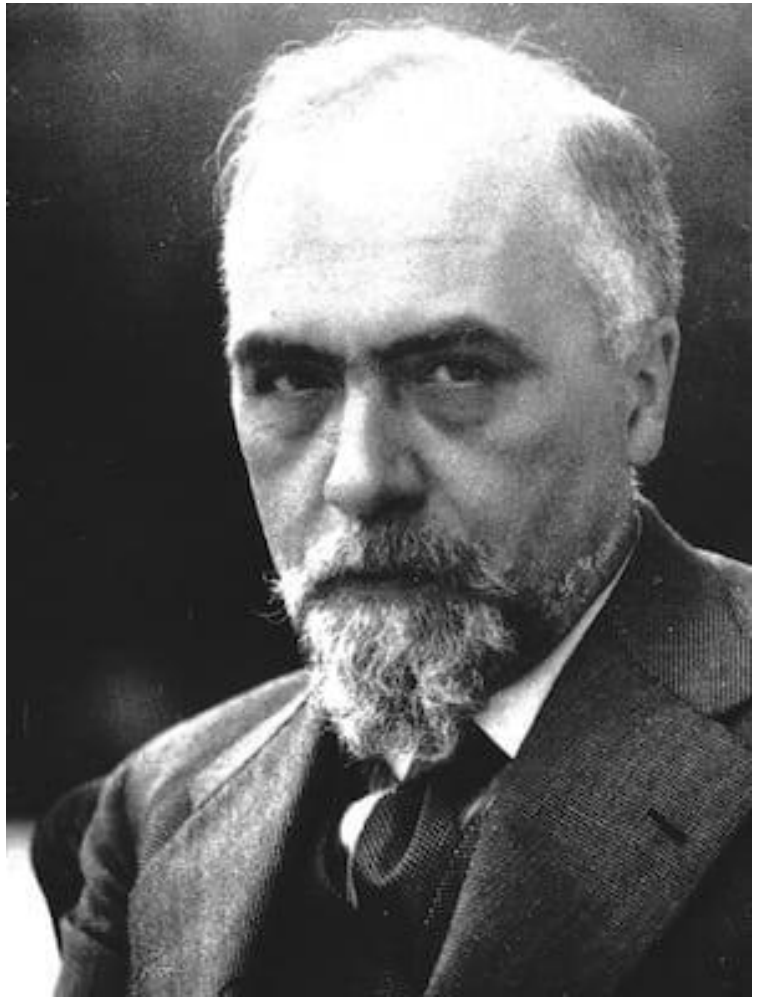
-Margaret Mead,
What is the earliest sign of civilization? Stone tools? A clay pot? Agriculture? Cave paintings? Religious icons?

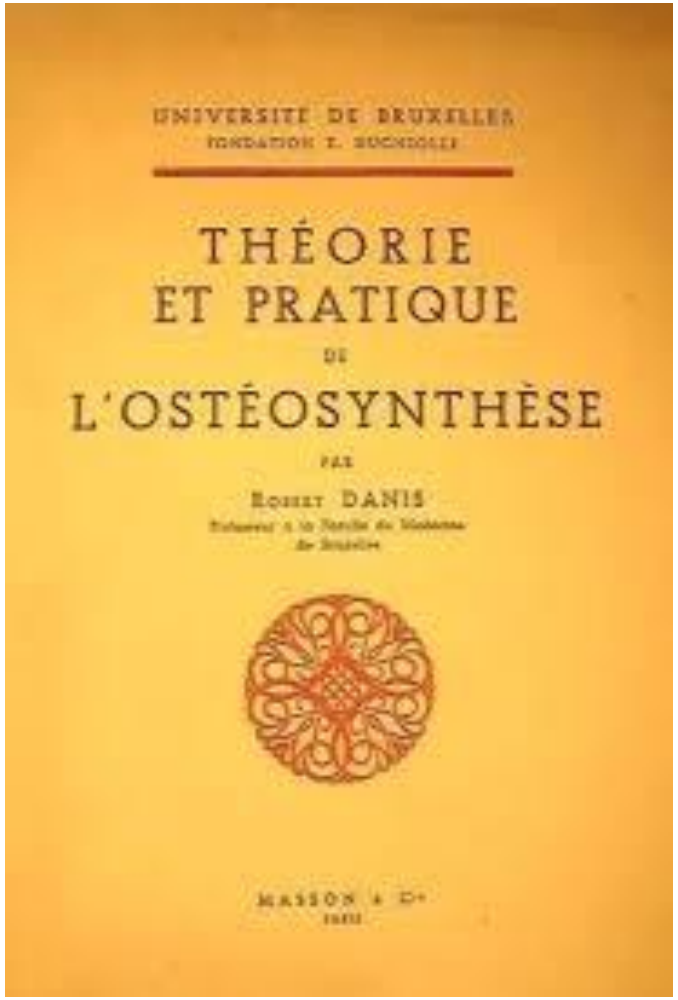

-Margaret Mead, What is the earliest sign of civilization? Stone tools? A clay pot? Agriculture? Cave paintings? Religious icons?
The first sign of civilization is a 100,000 yr old fossil of a femur.


In the animal kingdom, if you break your leg, you die. A broken femur that has healed is evidence that another person has carried the person to safety and has tended to them through recovery. it indicates that


someone has helped a fellow human, rather than abandoning him

Caminito S, Orangutan Osteobiography: Surviving Broken Bones, 2023



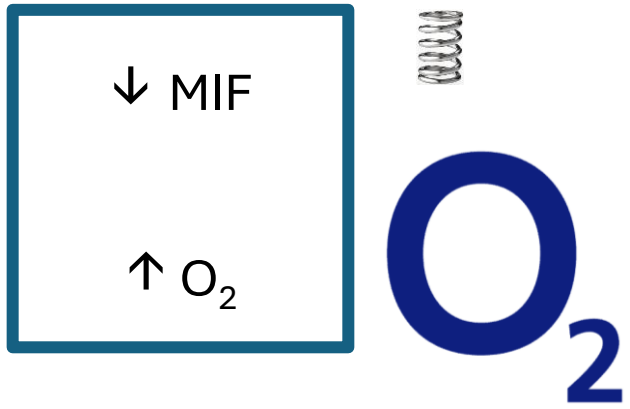



*«Il callo di frattura è patologico e deve essere evitato.»*

Robert Danis (1880-1962)

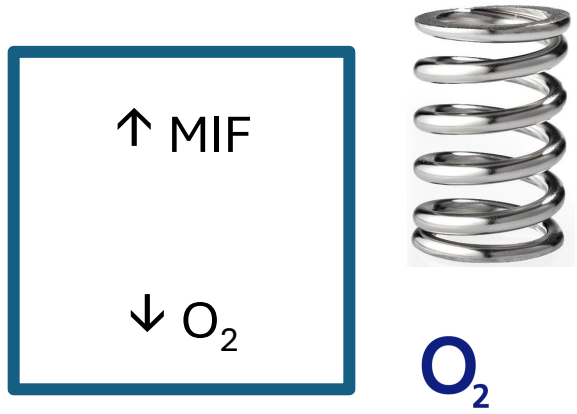
## Consolidazione primaria

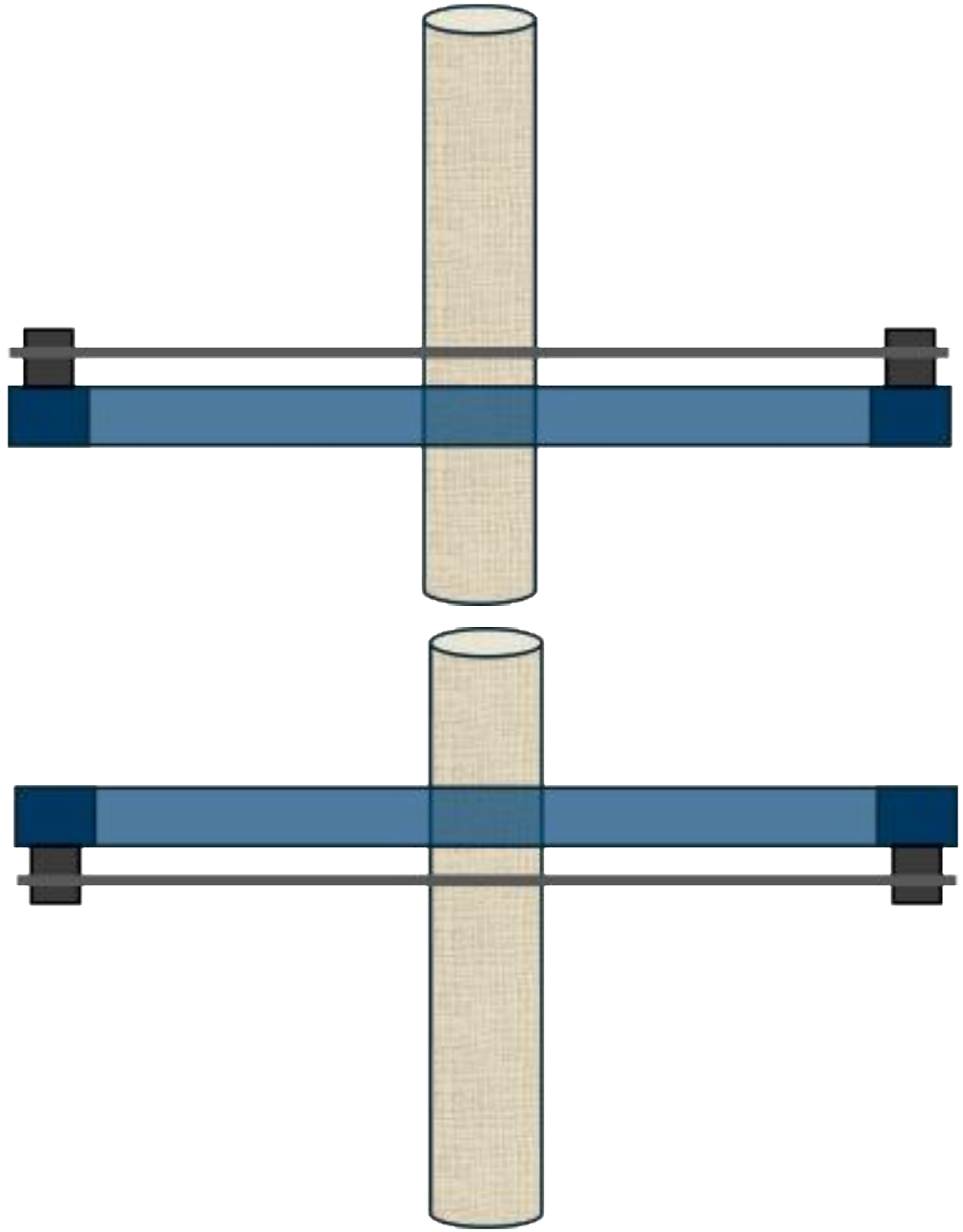
Solo intramembranosa

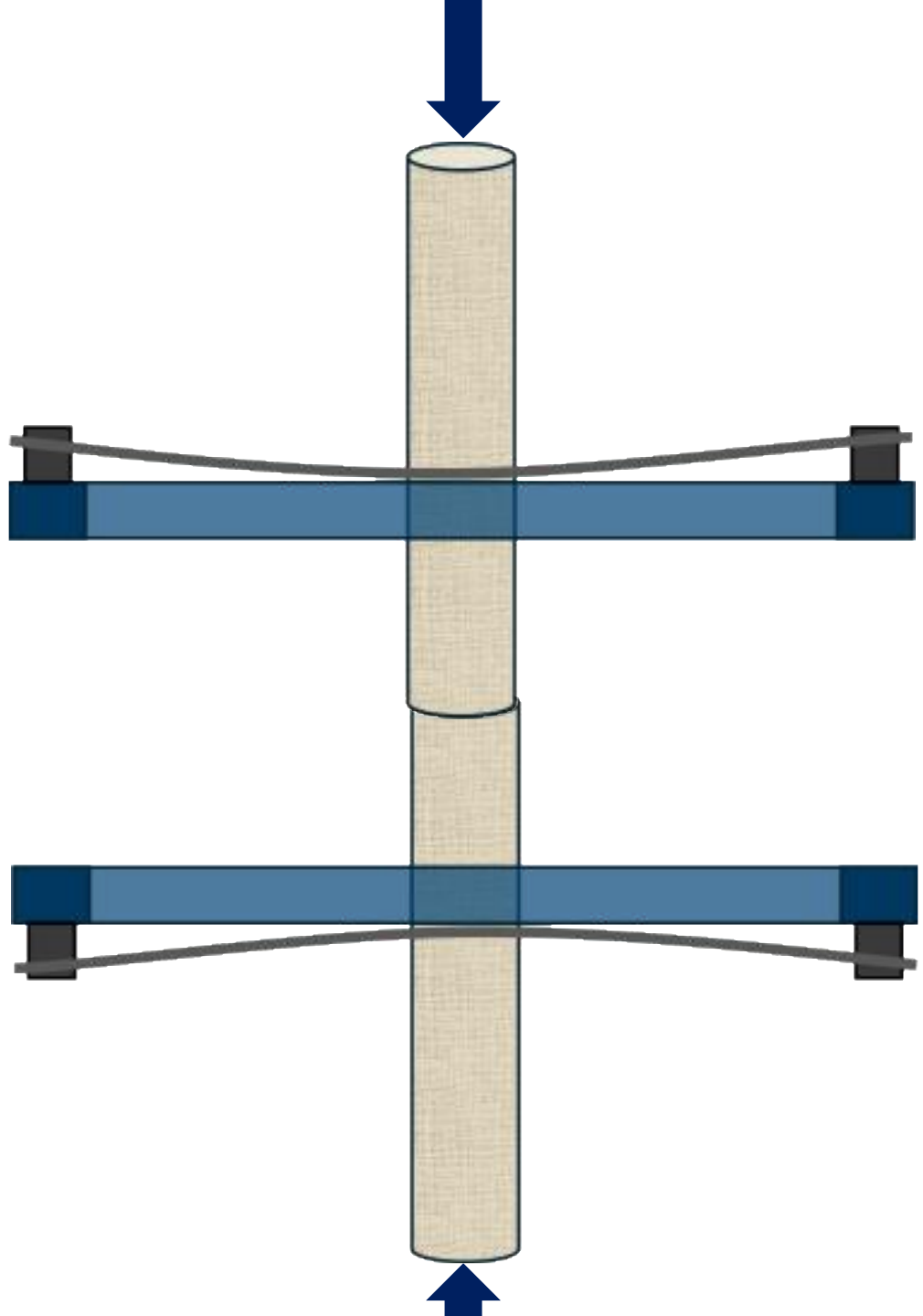


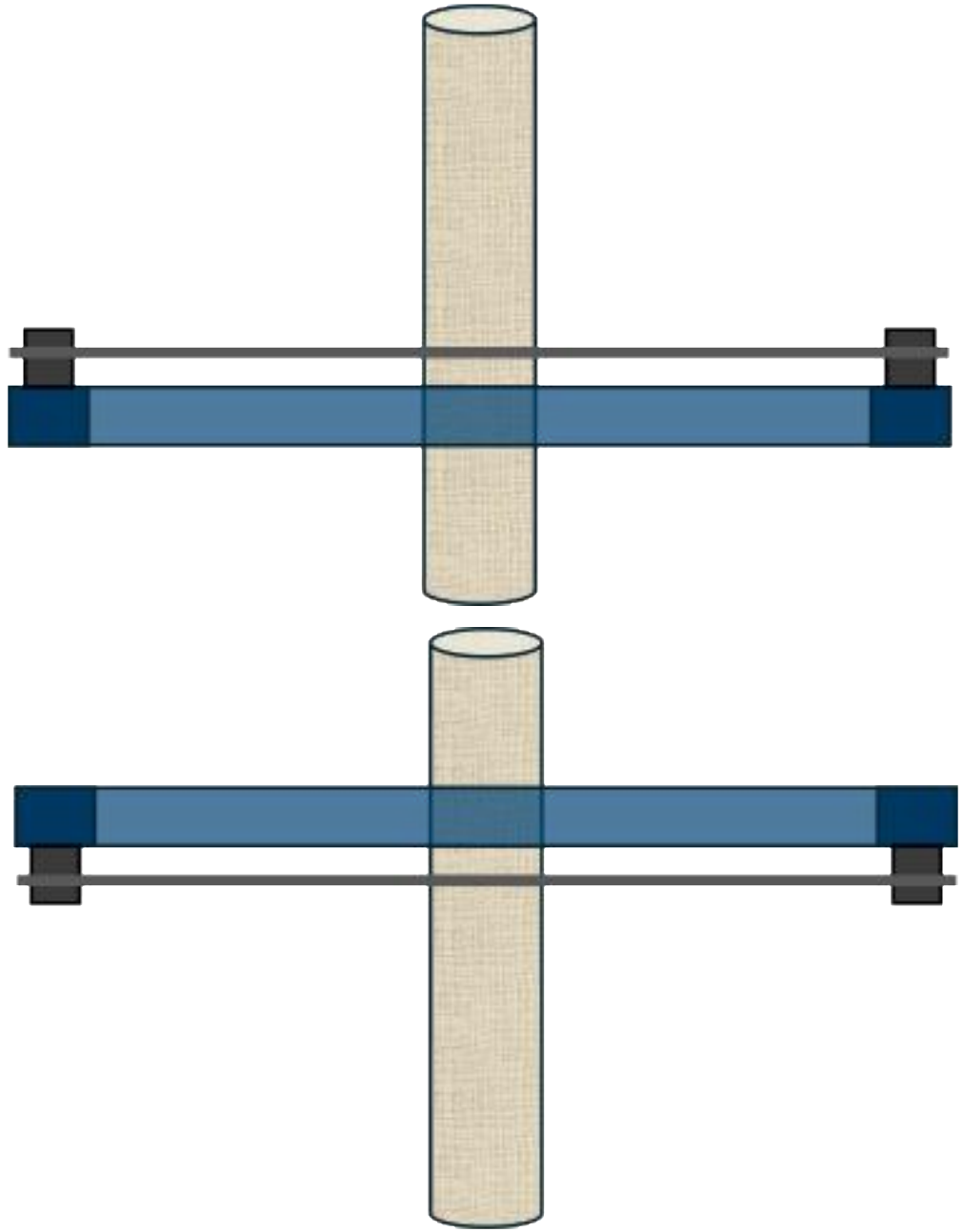

## Consolidazione secondaria

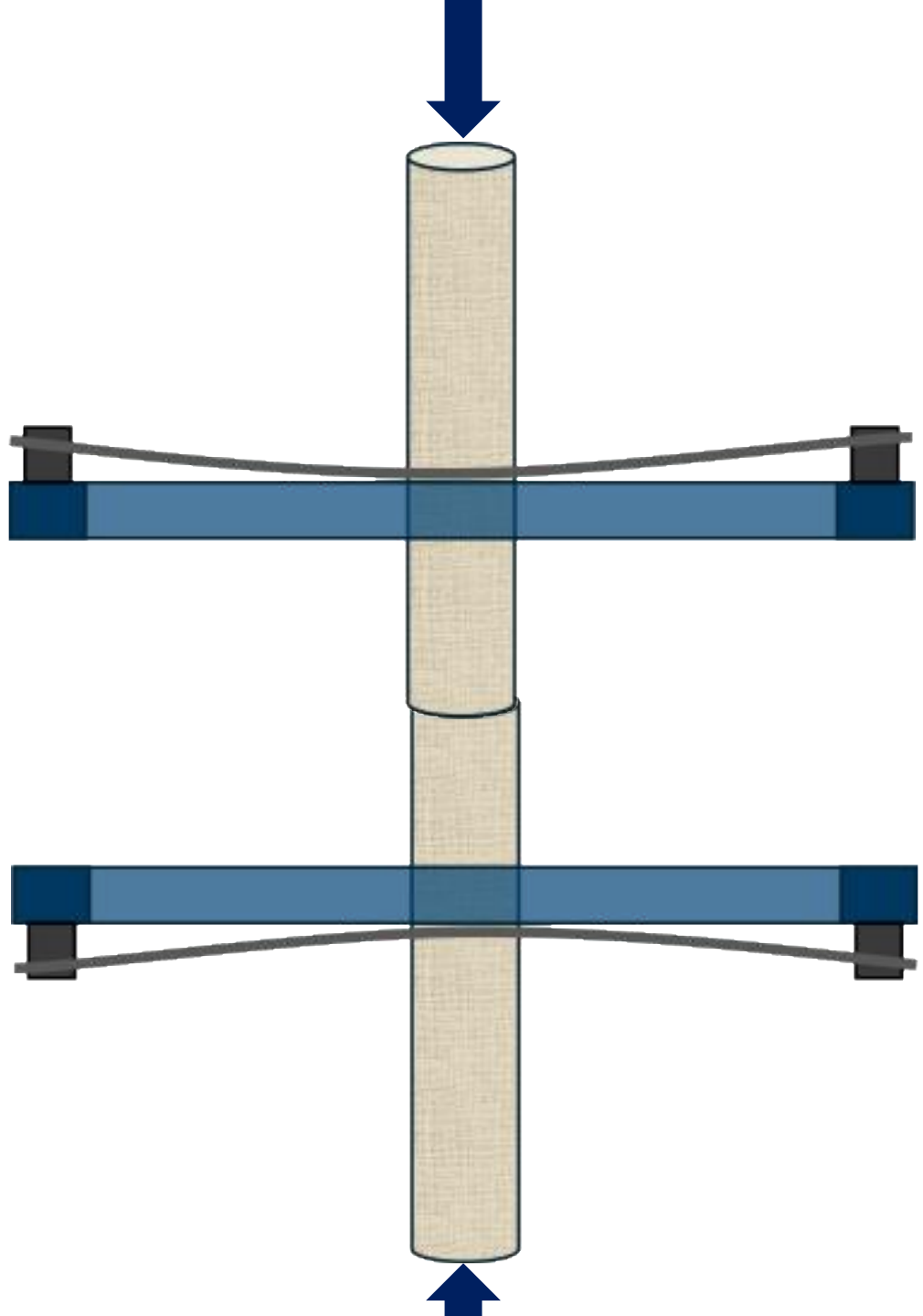
Intramembranosa + encondrale

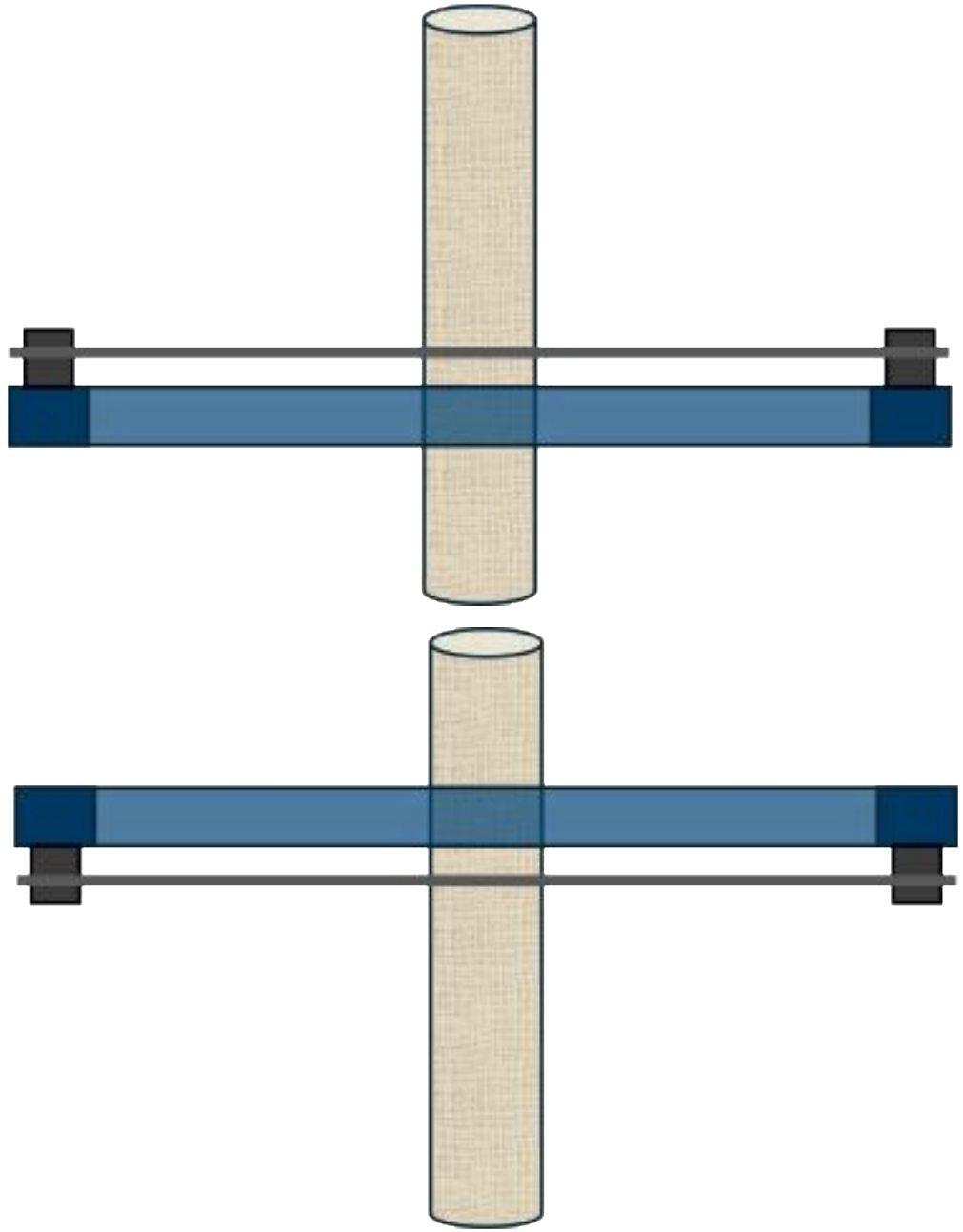






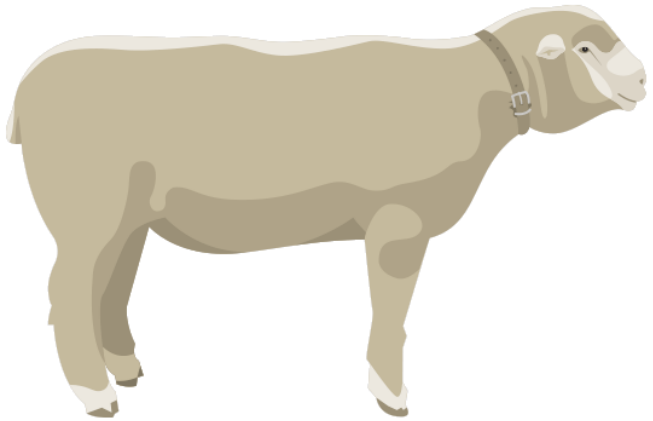


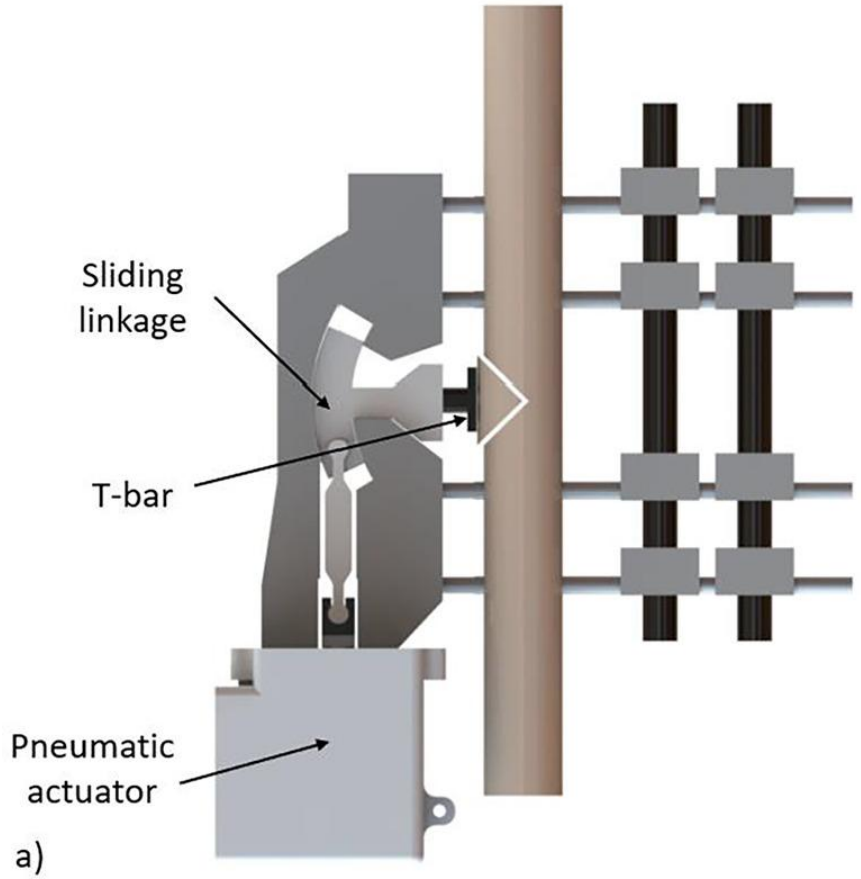


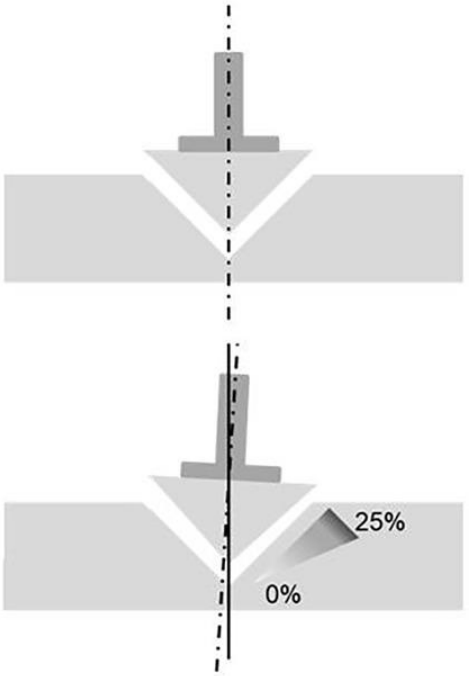



**2 gruppi:**

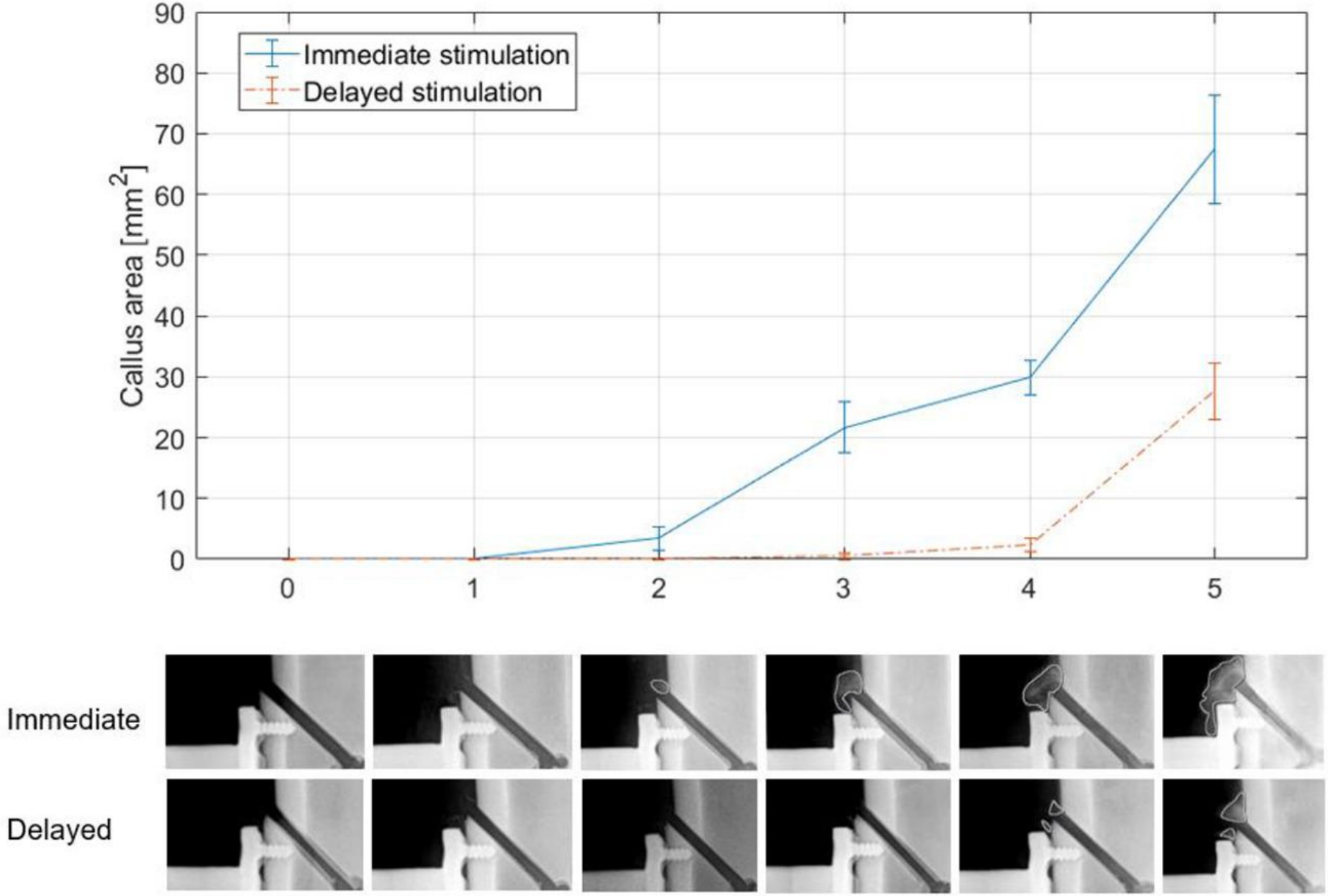
- **stimolazione immediata** (1000 cicli/giorno)
- **stimolazione ritardata** dal 22° giorno postop






Barcik J et al. Bone. 2023



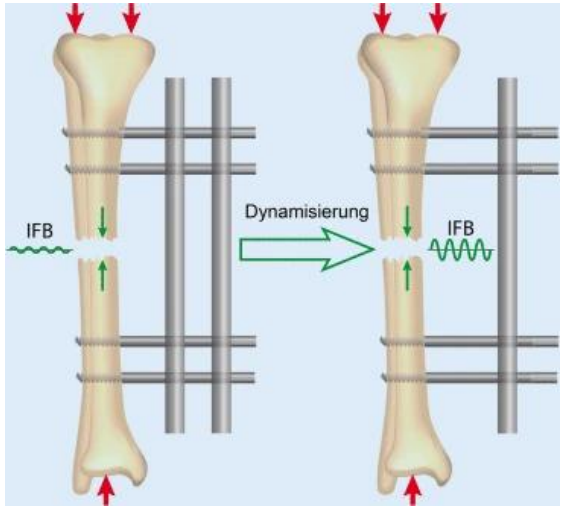

Barcik J et al. Bone. 2023

AO

AO Foundation

## Dinamizzazione «classica»

## Destabilizzazione del montaggio



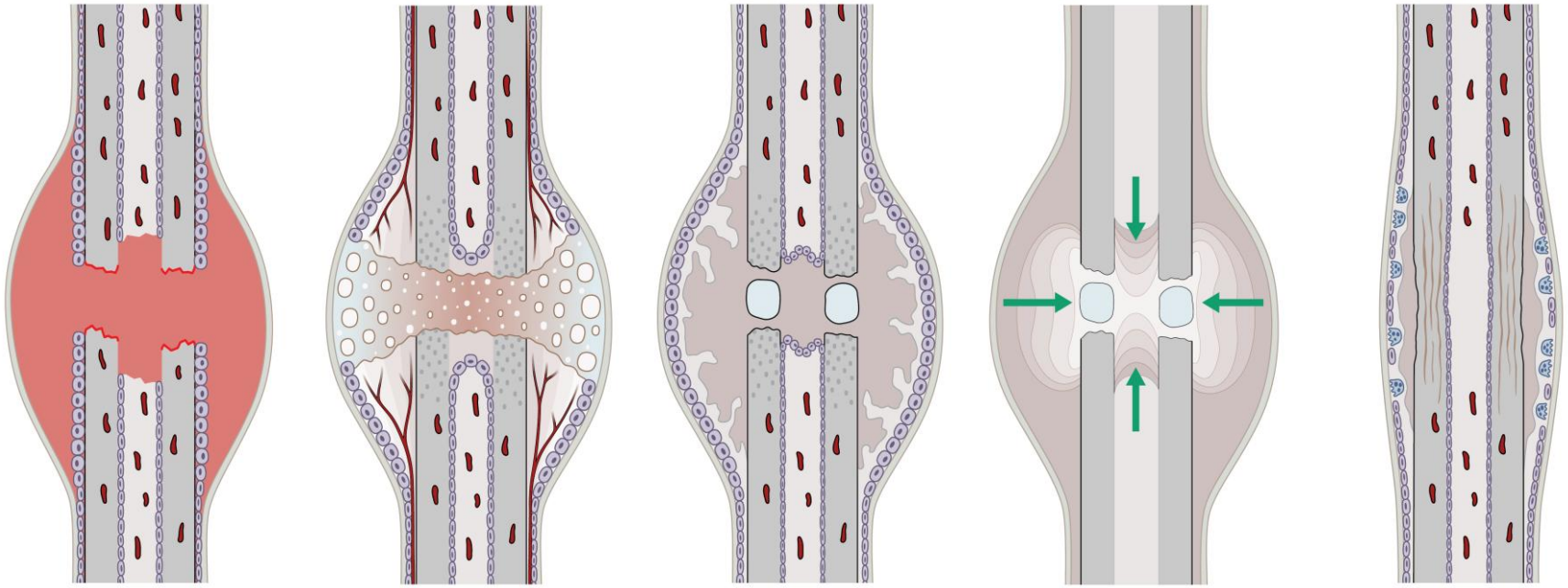

# Dinamizzazione inversa

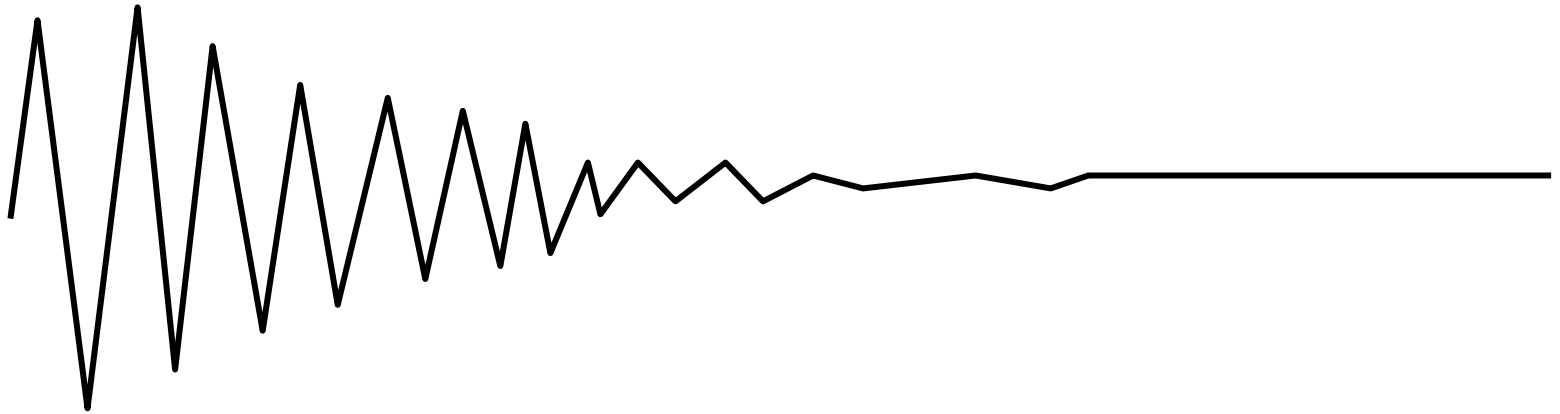


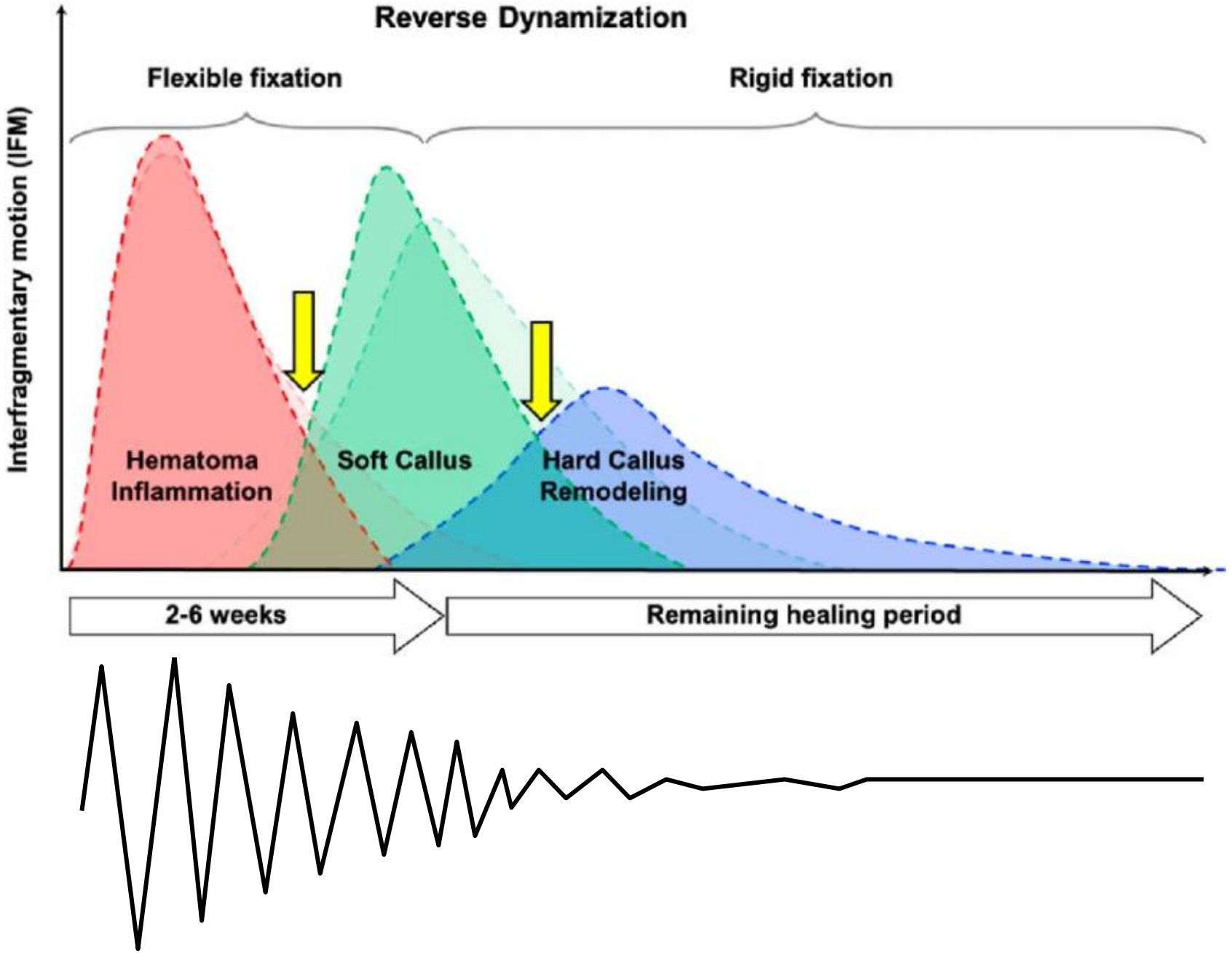
## Reverse Dynamization Accelerates Bone-Healing in a Large-Animal Osteotomy Model

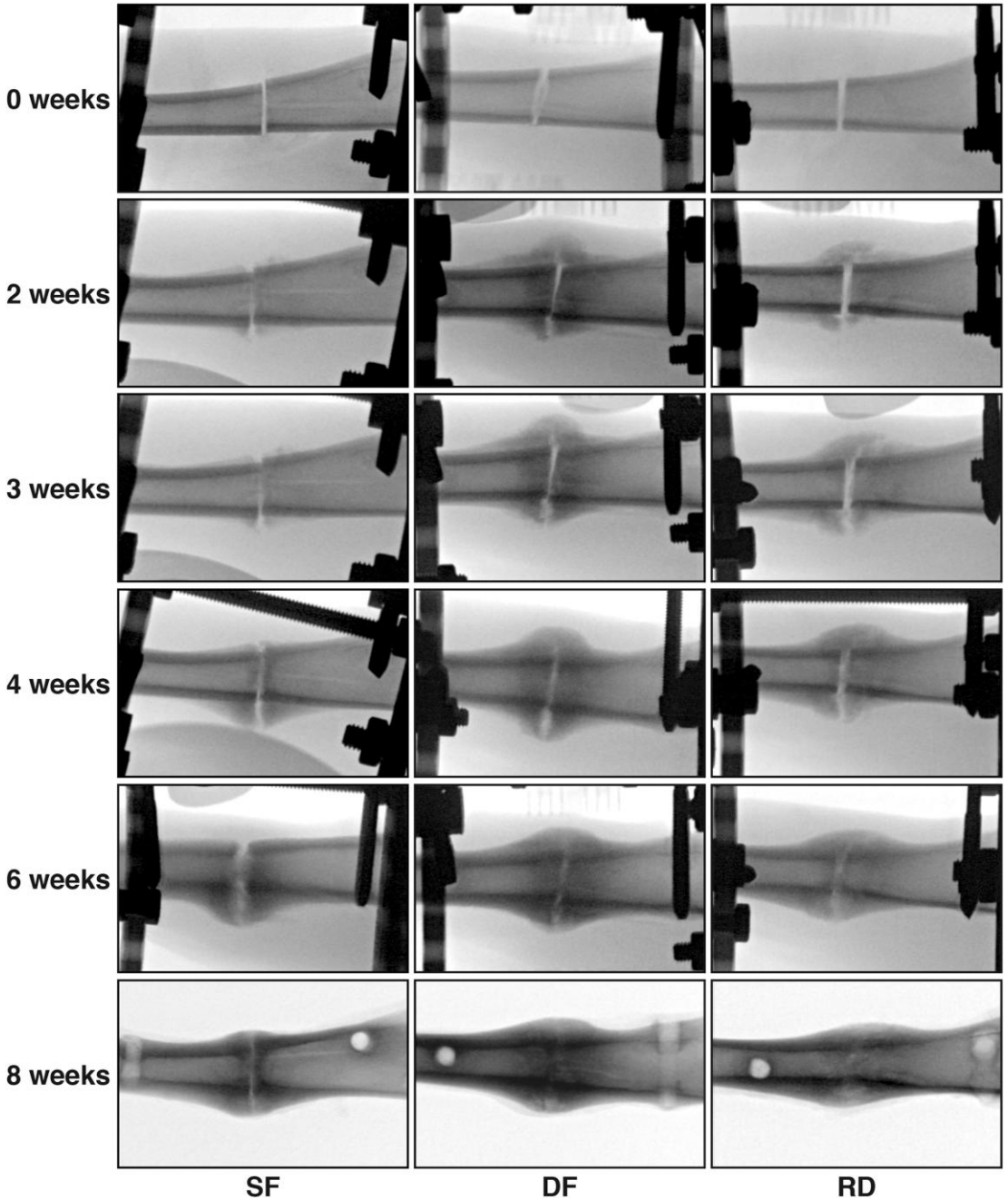
Vaida Glatt, PhD, Mikhail Samchukov, MD, Alexander Cherkashin, MD, and Christopher Iobst, MD

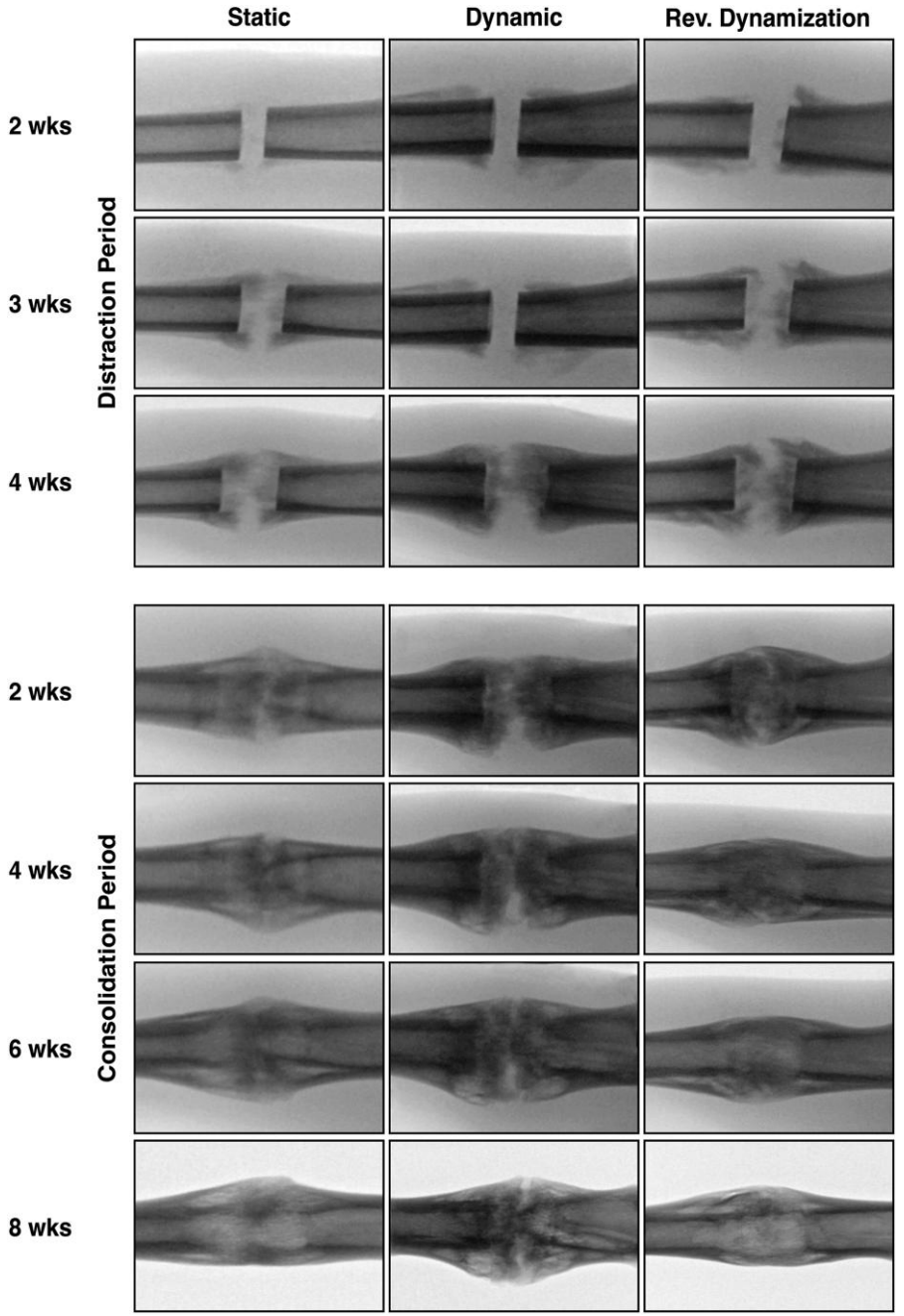
*Investigation performed at the Center for Limb Lengthening and Reconstruction, Nationwide Children's Hospital, Columbus, Ohio*






Reverse Dynamization
Flexible fixation
Rigid fixation
Interfragmentary motion (IFM)
Hematoma
Inflammation
Soft Callus
Hard Callus
Remodeling
2-6 weeks
Remaining healing period




Glatt V et al. J Bone Joint Surg Am. 2021
Bafor A et al. J Bone Joint Surg Am. 2023

# Accordion

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> Front Physiol. 2023 Sep 8:14:1259567. doi: 10.3389/fphys.2023.1259567. eCollection 2023.

## The accordion technique enhances bone regeneration via angiogenesis factor in a rat distraction osteogenesis model

Kai Liu [#] [1], Sulong Wang [#] [1], Ainizier Yalikun [1], Peng Ren [1], Aihemaitijiang Yusufu [1]

Affiliations + expand

PMID: 37745241 PMCID: PMC10514895 DOI: 10.3389/fphys.2023.1259567

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Oct 18;14(1):244 doi: 10.1038/s41598-024-71335-0.

## ion t ue did not improve bone o del of distraction osteogenesis

Kavaseri [1 2], Isabelle Villemure [4], Frank Rauch [1 5], Bettina M Willie [7 8]

654 DOI: 10.1038/s41598-024-71335-0

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