

CONGRESSO NAZIONALE SOCIETÀ ITALIANA FISSAZIONE ESTERNA

Fissazione esterna nel trattamento
delle emergenze e traumi militari,
tecniche di ricostruzione degli arti e
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Pain Management During External Fixation: Strategies and Outcomes

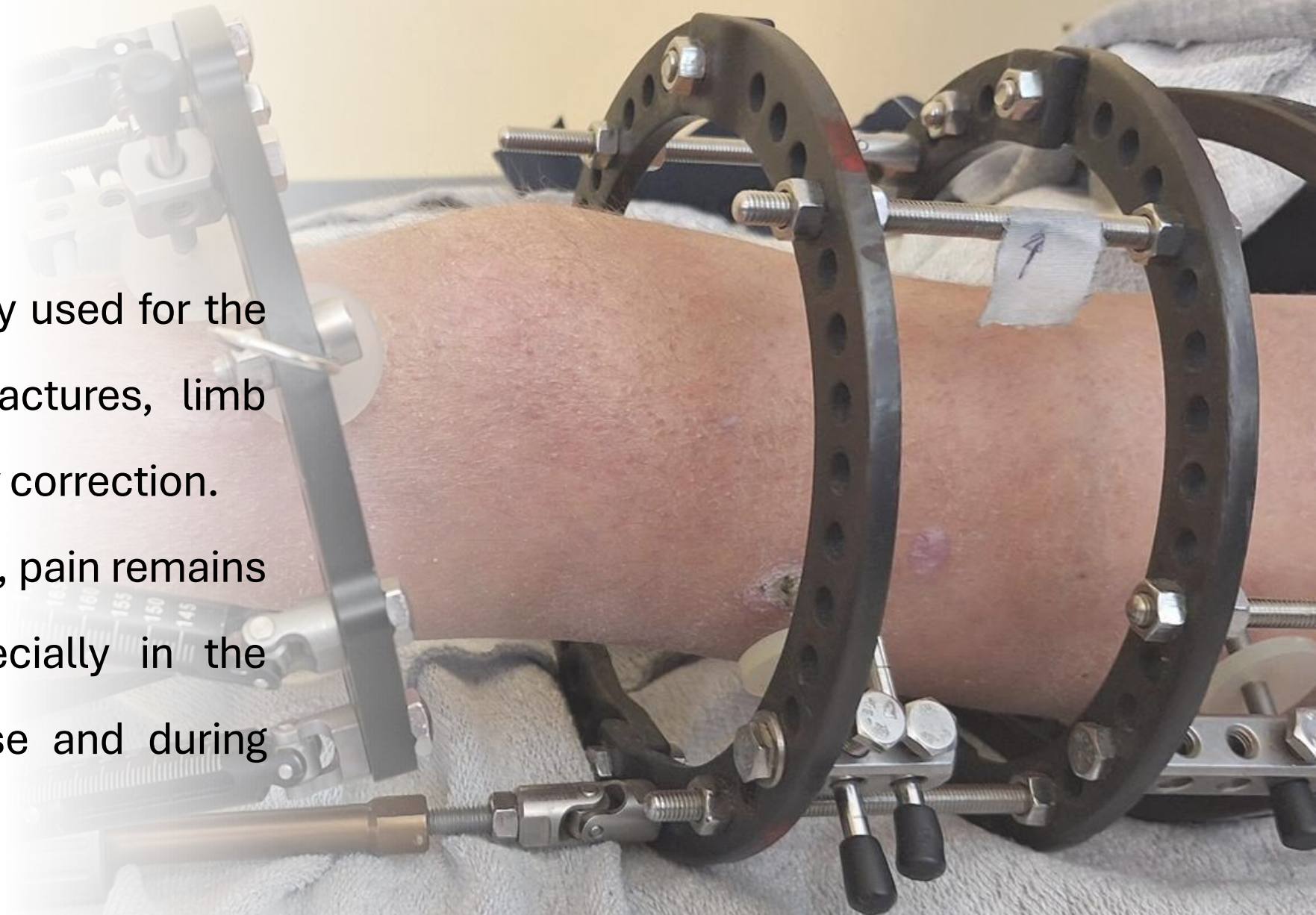
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Introduction

- External fixation is widely used for the treatment of complex fractures, limb lengthening, and deformity correction.
- Despite its effectiveness, pain remains a major challenge, especially in the acute postoperative phase and during distraction.



Objectives



To analyze the types and sources of pain during external fixation.



To present current strategies for pain management.

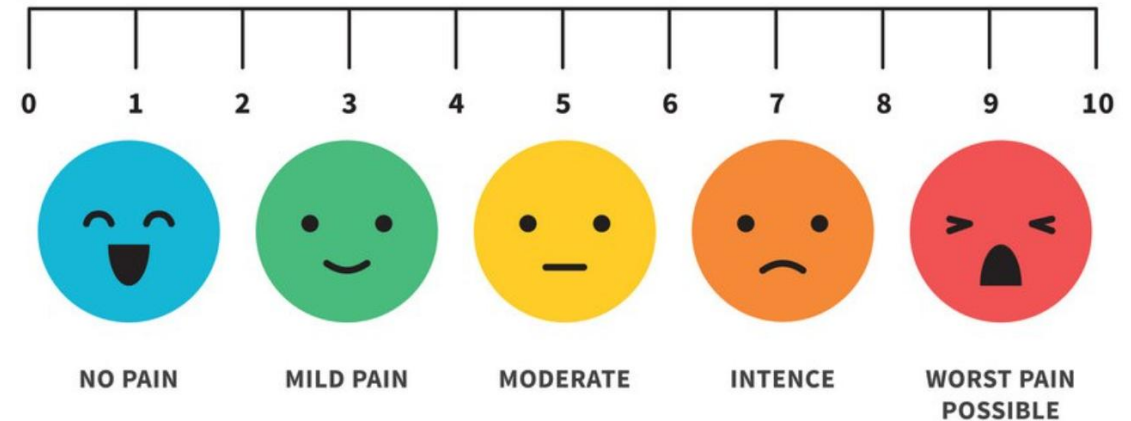


To discuss outcomes and recommendations based on clinical experience and literature.

Types of Pain

- **Postoperative Pain** – tissue trauma, inflammation.
- **Neuropathic Pain** – nerve irritation or entrapment.
- **Mechanical Pain** – due to movement, weight bearing, pin-site irritation.
- **Distraction Pain** – gradual stretching of soft tissues and nerves.

PAIN MEASUREMENT SCALE



Pathophysiology

- Inflammatory mediators (e.g., prostaglandins) activate nociceptors.
- Nerve stretching/compression leads to sensitization.
- Pin-site infections exacerbate pain response.



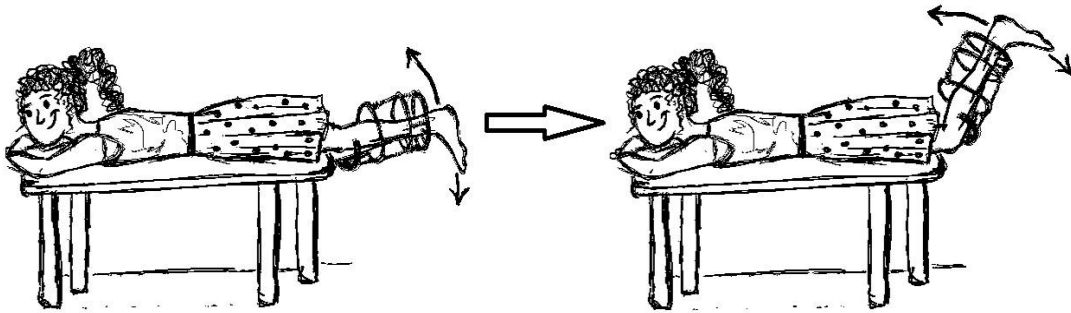
Pain Management Strategies

Pharmacological

- **NSAIDs** – for inflammation and baseline pain.
- **Opioids** – short-term, moderate to severe pain.
- **Gabapentinoids** – for neuropathic pain.
- **Local anesthetics** – peri-pin infiltration, nerve blocks.



Pain Management Strategies

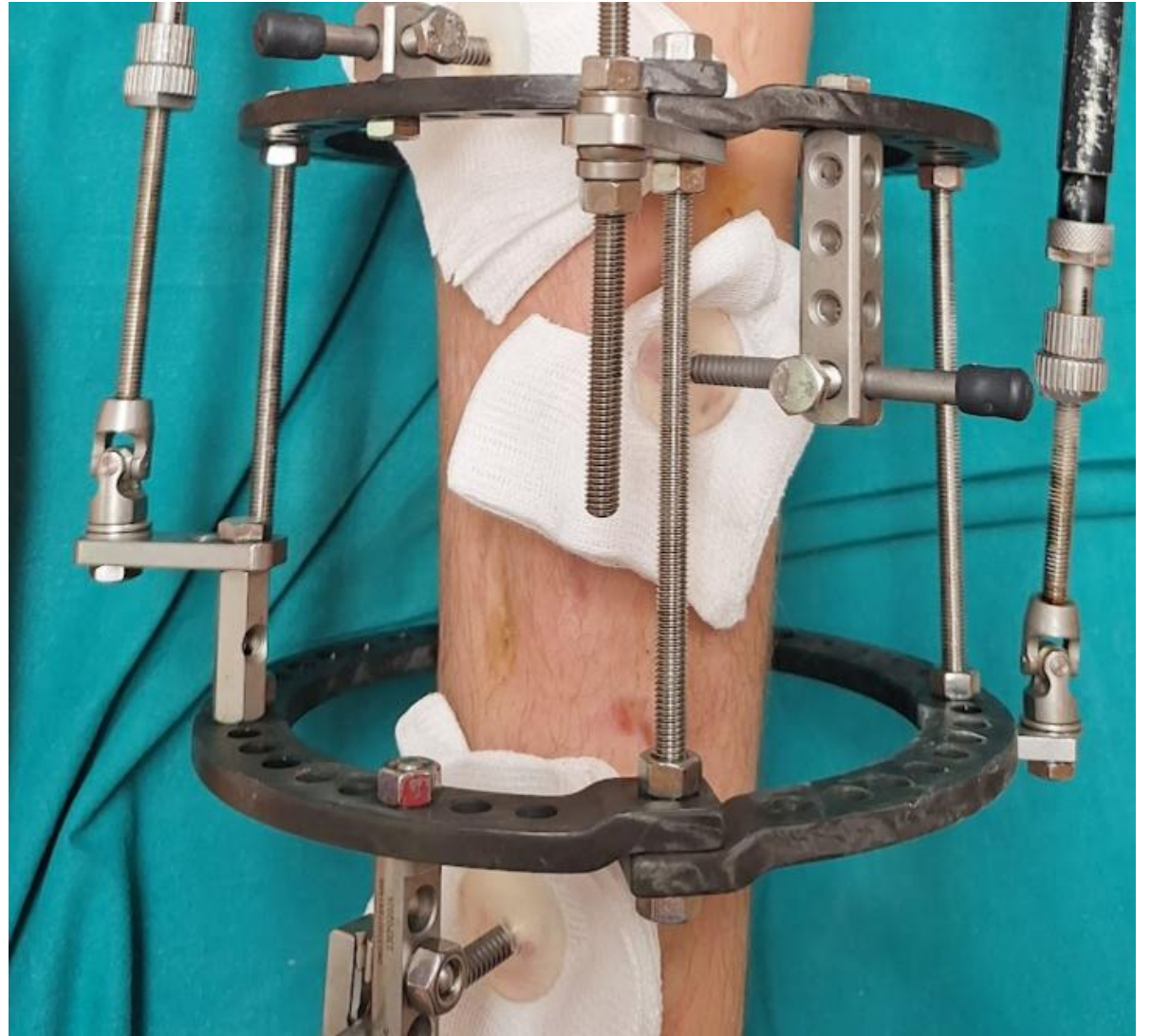


Non-Pharmacological

- **Physiotherapy** – early mobilization, desensitization.
- **Psychological support** – cognitive behavioral therapy.
- **Cold therapy** – for acute pain/inflammation.
- **Patient education** – expectations, pain journaling.

Surgical Considerations

- Ring diameter no more than 3 cm larger than the limb diameter
- Fiches replace all K-wires wherever possible
- For each ring, at least 2 fixation points, preferably perpendicular to each other



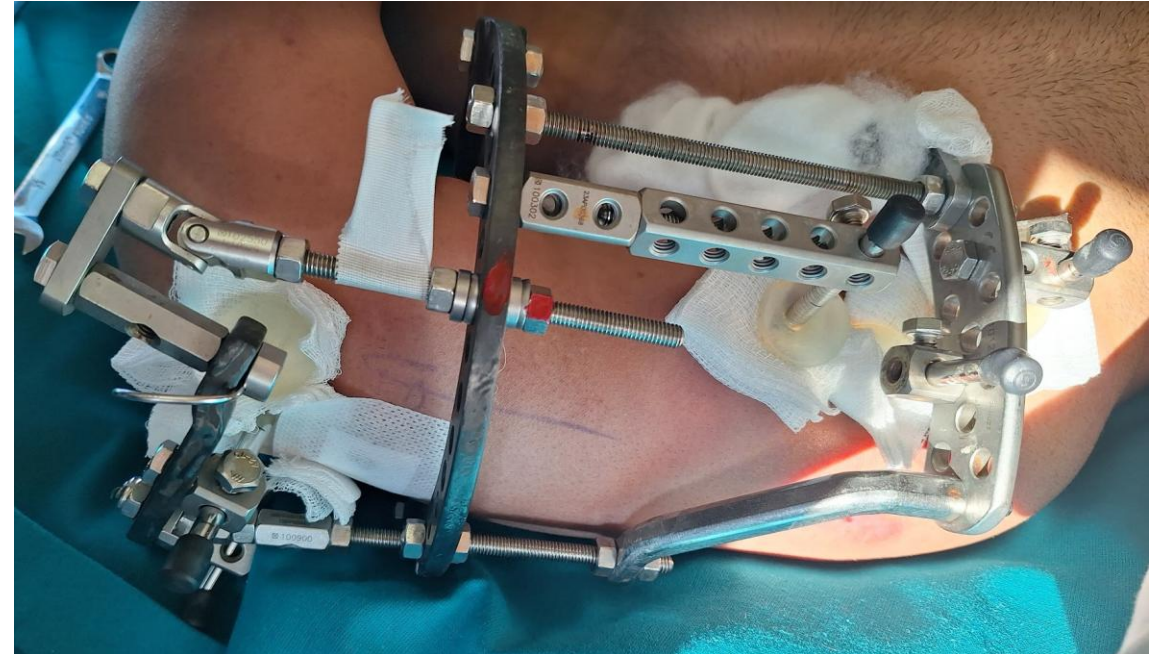
Surgical Considerations

- Rings connected to each other with rods or threaded sleeves, or by using oblique supports
- No use of olive wires
- K-wires tensioned between 90 and 110 kg
- Use of arches and hemiarches where possible (proximal femur)



Surgical Considerations

- Optimal pin placement to avoid neurovascular structures.
- Use of hydroxyapatite-coated pins to reduce inflammation.
- Careful tensioning and alignment to prevent undue stress.



Outcomes

- Multimodal pain management improves compliance and recovery.
- Better sleep quality, mobility, and reduced need for long-term opioids.
- Early rehabilitation reduces total duration of fixation.



Conclusions



Pain during external fixation is multifactorial and must be proactively managed.



A tailored, multimodal approach is essential.



Ongoing monitoring and adjustment of treatment plans improve outcomes and patient satisfaction.



GRAZIE