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Enhanced Pain Relief In Chronic Knee Osteoarthritis: A Technical Guide To Stem Cell And Radiofrequency Therapy

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Faculty Disclosure Information

- Nothing to disclosure

Background

Knee osteoarthritis (KOA) is a chronic degenerative disease prevalent in the elderly, especially in women, causing severe pain and difficulty in daily activities. Common treatments include surgery and joint injections. In cases refractory to conservative treatment, ultrasound-guided saphenous nerve block and pulsed radiofrequency (PRF) are effective options for analgesia. PRF, a technique that uses short pulses of RF combined with bone marrow aspirate (BMA), an autologous biological material composed of stem cells and growth factors, offers a new approach for the management of pain and inflammation in KOA, promoting prolonged pain relief and improved function.

OBJECTIVES

This study proposes a combined technique of BMA and PRF as a promising approach in regenerative medicine for pain control in chronic knee osteoarthritis.

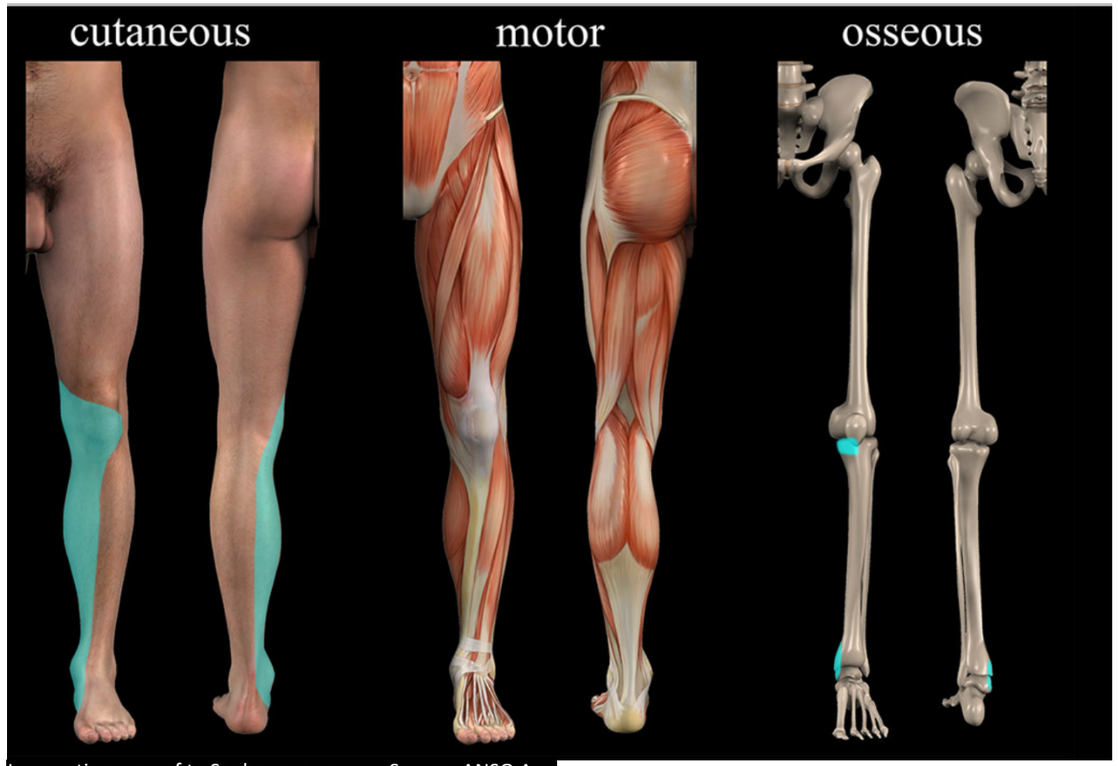
Introduction

Osteoarthritis (OA) is a chronic and progressive disease characterized by severe pain, joint stiffness, and limited range of motion, especially in the elderly. The inflammatory process in OA involves pro-inflammatory cytokines, such as IL-1β and TNF-α, which contribute to the degradation of the extracellular matrix and chondrocyte apoptosis.

Although there are surgical and nonsurgical treatment options, such as arthroscopy, osteotomy, arthroplasty, lifestyle changes, and use of NSAIDs, many patients continue to have refractory pain. Less invasive techniques, such as ultrasound-guided peripheral nerve block and PRF, have demonstrated efficacy in modulating neuropathic pain.

SAPHENOUS NERVE

The saphenous nerve is a terminal branch of the femoral nerve, which provides sensory innervation to the anteromedial, medial, and posteromedial regions of the lower limbs, from the distal part of the thigh to the medial malleolus.

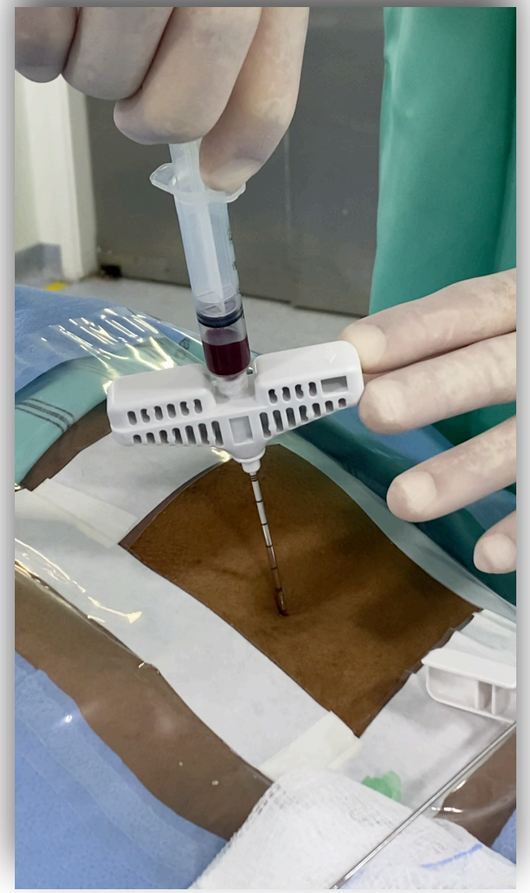


Innervation map of te Saphenous nerve. - Source: ANSO App

TECHNIQUE

BONE MARROW ASPIRATE

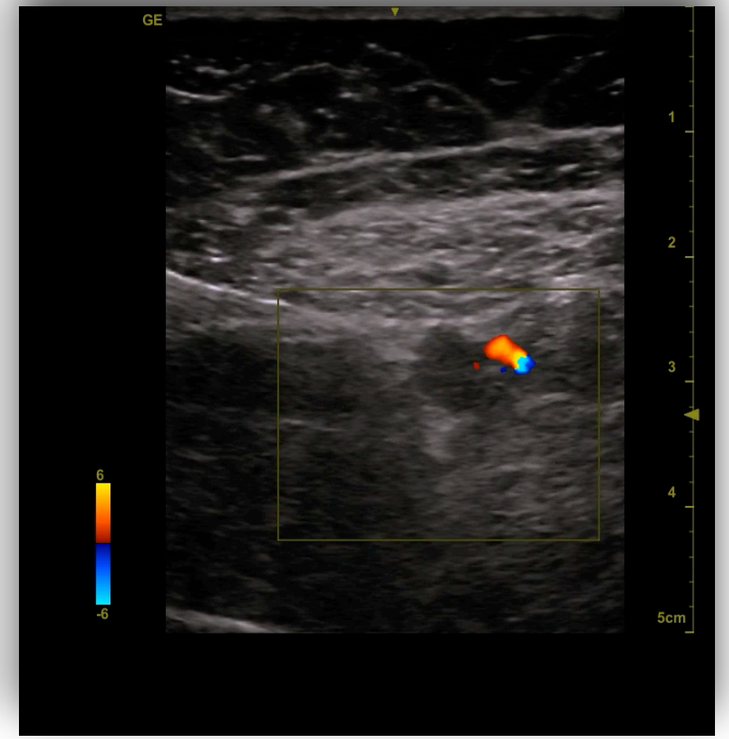
For BMA use, autologous aspirate is collected from the posterior iliac crest using sterile technique.



TECHNIQUE

SAPHENOUS NERVE BLOCK

Ultrasound-guided saphenous nerve block is performed with the patient in the prone position, using a linear transducer to identify target points along the femoral artery.



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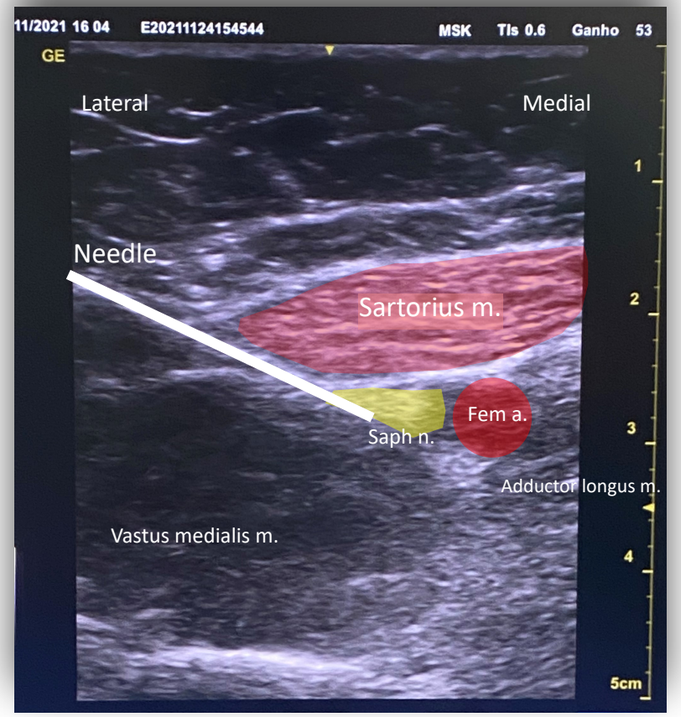

TECHNIQUE

BONE MARROW ASPIRATE Injection

After collection, 10ml of BMA is injected into the joint space of the affected knee and the other 10ml along the saphenous nerve

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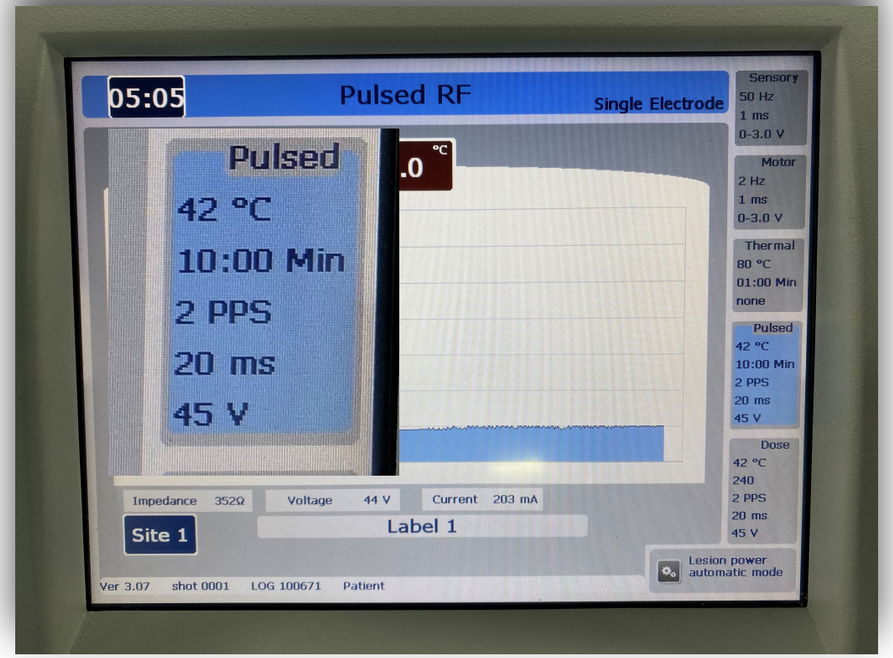
TECHNIQUE

PULSED RADIOFREQUENCY

After BMA injection, treatment is followed by application of PRF under the parameter of 45V, 20ms wave weight, 2 Hz, 42ºC, for 10 minutes.



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Conclusion

BMA + Pulsed Radiofrequency

- The combination of bone marrow aspirate (BMA) and pulsed radiofrequency (PRF) in the management of knee osteoarthritis pain represents a promising and minimally invasive approach.
- Evidence suggests that these techniques, when combined, can significantly improve clinical outcomes, such as pain relief and functional improvement, financial viability and rapid recovery after the procedure, increasing patients' quality of life.
- Additional studies are needed to validate the application and identify the patients who benefit most from this therapeutic combination.

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