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Short Communication

Osteoarticular Maneuvers and Exercises for the Relief of Pain and Restoration of Knee Mobility

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Injuries involving the knee occupy the third place in the list of those insured by social security in Brazil, among these cases, osteoarthrosis is often one of its causes, being more common in the female gender with onset around 40 - 50 years [1]. Besides osteoarthritis, postoperative (arthroplasties, ligament reconstruction, and meniscectomies) and impairments that have conservative treatment as the choice (femur-patellar syndrome, tendinopathies, meniscal and ligament injuries, and fractures) commonly are causes of pain, joint stiffness, and progressive loss of function [2-6].

In cases of radical treatment, there is an obvious need for early mobilization; however, cases of conservative treatment involving prolonged immobilization or rest also lead to joint complaints. For these cases, joint mobilization techniques such as Maitland's, Mulligan's, and McKenzie's concepts may help relieve pain and stiffness. It is through activation of peripheral (gating theory) and central (descending inhibitory pathway) analgesic pathways, in addition to the temporary increase of space between the joint surfaces, that patients with knee involvement benefit [7-12].

However, such resources may not be resolutive, but that they are part of a comprehensive treatment, in order not to create dependence or false expectations with the maneuvers [13-16]. It is not the purpose of this release to delve into the study of Maitland, Mulligan and McKenzie, the intent is to function as a quick reference guide for the physical therapist, from the illustration and description of the maneuvers applicable to the knee. Remember that these are basic techniques, with variations and alternatives, but that even so, they must be performed after previous and specific evaluation of each patient. In order to facilitate understanding, the techniques were compiled in "passive, active-assisted and active", but each concept is commonly studied individually and these nomenclatures are rarely used [17].

The passive articular techniques (Figure 1 A-F) are characterized by rhythmic and oscillatory accessory movements graded I - IV by Maitland. The patient's participation is restricted to relaxing, not blocking the movement, and allowing the physiotherapist to work. Mobilizations I-IV should be applied in 4-6 series of 20 seconds to 2 minutes each. Figure 1G shows a proposed positioning to gain knee extension, assisted by the addition of load and the maintained position without joint movement.

Figure 1: Passive Articular Techniques. 1A. Latero-lateral mobilization of the patella. 1B. Inferior (caudal) patellar mobilization. 1C. Upper (cephalic) patellar mobilization. 1D. Posterior sliding of the tibia with the femur fixed. 1E. Medial sliding of the tibia with the femur fixed. 1F. Anterior tibial slip with traction under the fixed femur. 1G. Sustained distal weight discharge forcing knee extension.

The techniques described here as "actively assisted" (Figure 2 A-C) were proposed by Mulligan, who brings an approach to joint glides by "trial and error". During the requested exercise, the physiotherapist should follow the movement with a facilitatory joint glide (mobilization with motion - MWM) and analyze whether or not there was improvement in the patient's complaint. If the answer is positive, the positioning is maintained. If it does not change or worsen the symptoms, then the professional should use another glide until he or she finds a way to help the joint kinematics that provides symptom improvement, or decide not to use the technique. This "test" of the ideal treatment plan (glide) should be performed up to a maximum of 10 repetitions, and then the MWM should be performed for 3-4 sets of 10 repetitions [18]. Figure 2B has the particularity of being commonly applied in cases of meniscal injury; it is called the Mulligan Concept "Squeeze" Technique (MC Squeeze Technique) and consists of applying sustained force on the joint line during the active movement of knee flexion and/or extension with final overpressure by the patient. Tolerable discomfort during the technique is acceptable, but not exacerbation of pain, and the technique should be practiced for 3 sets of 10 repetitions [19].

The active joint techniques or self-mobilizations (Figure 3 A-E) are orientations carried out and tested during physiotherapeutic care that should be incorporated into the patient's routine, since symptom improvement has been reported with such movements and the patient is able to reproduce them accurately. The aforementioned concepts are adopted for active-assisted joint techniques and an overpressure at the end of the movement in order to increase the final ROM [13,18].

Figure 2: Active-assisted articular techniques. 2A. Active knee flexion associated with internal rotation of the tibia and fibula. 2B. Active knee flexion with over pressure associated with compression at the joint line by the physical therapist. The same approach can be performed associated with knee extension (MC Squeeze Technique). 2C. Active knee extension associated with external rotation of the tibia and fibula.

Figure 2: Active-assisted articular techniques. 2A. Active knee flexion associated with internal rotation of the tibia and fibula. 2B. Active knee flexion with over pressure associated with compression at the joint line by the physical therapist. The same approach can be performed associated with knee extension (MC Squeeze Technique). 2C. Active knee extension associated with external rotation of the tibia and fibula.

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