

Expert Consensus

Implication of Unloader braces in guideline recommended knee OA management

Who, when and how?

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Guidelines for the treatment of knee osteoarthritis have been published by a number of expert groups. Recently the OARSI and the British National Institute for Health and Care Excellence (NICE) published their recommendations for the non-surgical treatment of knee osteoarthritis. In addition to a core treatment such as patient education, weight management and exercise, biomechanical interventions such as insoles or unloader braces are recommended by these guidelines. In order to provide prescribers with a patient selection tool, as well as guidance with regards to when an unloader brace is an appropriate treatment, experienced orthopedic surgeons discussed these questions and developed suggestions to achieve the best possible treatment outcome.

Introduction

Currently there is no method to fully restore a joint with osteoarthritis. Treatment is mainly palliative, starting with exercise and lifestyle modifications and simple analgesics (e.g. acetaminophen), progressing to stronger medication, injections and ultimately joint replacement. However, the effect of pharmaceuticals is limited and is accompanied by a potentially high risk of side effects. While joint replacement is successful, its use is generally reserved for patients with end stage osteoarthritis due to

serious risks and potential side-effects. Furthermore, some patients are reluctant to undergo surgery unless they have exhausted less invasive alternatives. Finally, some reimbursement agencies are now requesting proof of tried and failed non-surgical treatment prior to funding surgery. Actual knee OA Guidelines published by the OARSI (Osteoarthritis research Society International, ACR (American College of Rheumatology) and the NICE (National Institute for Health and Care Excellence, United Kingdom) recommend the use of biomechanical interventions including unloader braces for knee OA patients without and with co-morbidities such as gastro-intestinal problems, renal dysfunction or other when appropriate^{1,2,3}.

The unloader braces are designed to reduce load in the affected compartment of the knee. A meta-analysis by Moyer et al. investigated the change in knee adduction moment. They included 17 published articles and concluded that braces do reduce the knee adduction moment and this change is highly significant (effects size 0.61, $p < 0.001$)⁴.

In addition to reducing knee adduction moment, knee osteoarthritis braces have been shown to increase the joint space in the affected compartment, reduce compartmental load in subjects with total knee replacements, and improve proprioception. Notably, Katsuragawa et al. showed a large and significant increase in bone mineral density in the lateral knee compartment relative to the medial compartment when wearing an Unloader brace for medial knee osteoarthritis⁵. This strongly supports the argument that the Unloader shifts load off the medial compartment, as it is known that bone adapts to the loads under which it is placed⁵.

One argument commonly used against the use of bracing is that it reduces strength about the knee. However, to date, two studies have investigated this hypothesis and found that muscle strength about the knee actually increased with use of an osteoarthritis knee brace^{9,10}. The most likely explanation for this is that the reduction in pain allows for increased activity and thus increased knee strength.

As recommended by the recently published knee osteoarthritis guidelines, the knee osteoarthritis patient should increase activity, optimize body weight management and increase muscle strength. For many patients however, their pain prevents them from becoming more active, thus making weight loss and strength training difficult. An unloader knee brace – either on its own or in conjunction with pharmaceutical treatment - can provide rapid pain relief enabling patients to increase their activity levels, reduce weight and build strength. Unloader braces can also be used to unload a medial or a lateral compartment after local cartilage repair of large defects during the maturation process of the repair.

Methodology

Questionnaires on current practice of non-surgical management of symptomatic knee OA were used to prepare an on-site meeting with experts. The questionnaires were collected and the answers analyzed. Based on this feedback a meeting was conducted and the results of the questionnaires scrutinized. Subsequently, the experts concluded on preliminary recommendations.

Recommendations

General

- Unloader braces are used in an individual OA management approach in conjunction with guideline recommended core treatment in order to avoid surgery in KL grade I-III uni-compartmental knee OA patients suffering from moderate to severe knee pain.

- Unloader braces are used in patients eligible for high tibial osteotomies (HTO) in order to identify those patients who will most likely benefit from a HTO.
- Unloading of large cartilage defects after local cartilage repair.

Who should get an Unloader brace?

- Patients with varus- or valgus knee OA with clinically relevant knee pain affecting activities of daily living.
- Also patients indicated for total knee arthroplasty (TKA) who do not want a TKA yet or TKA is contraindicated.
- Patients should have an active lifestyle and understand instructions on how to use the Unloader brace.

Age and OA stage are no valid parameter to select the right patients for an Unloader brace. Therefore the authors recommend an Unloader Brace Test (UBT) after selecting the brace which fits best to their individual needs and anatomy.

After initial fitting the brace should be tested for 5-10 minutes. Within this time patients should walk on flat ground as well as stairs (up and down) and check if they are capable of donning and doffing the brace. For the Unloader One and Unloader FIT braces it is known that patients often can feel an immediate onset of pain relief within the UBT⁶. Those patients are “responders” and would most likely benefit from wearing the Unloader One / FIT brace.

For patients with peripheral vascular disease, neuropathy, and sensitive skin, close physician supervision is recommended.

Managing patients' expectations

Within non-surgical knee OA management it is important to manage patients' expectations. Non-surgical knee OA management is treating symptoms and not the disease itself. If symptoms like knee OA pain and knee function are to be improved, patients have to adapt their lifestyle and adapt their body weight if necessary. Patients should be informed that a brace, even if lightweight and easy to use is still a brace - “You may not love this brace, but you will love what it does for you,” was one comment used to describe it. Based on the experience and available clinical data patients can expect clinically relevant pain relief and improvement of knee function^{7,8}.

When to use an Unloader brace?

“UBT-Responders” should use the brace during the day while being active. In the beginning, the brace should be worn for a couple of hours only to get used to it. A clinical control should take place after 8-12 weeks but can be done by the clinician as well to ensure a proper fit of the Unloader brace. Outcome of the knee OA management should be evaluated regularly. When experiencing less pain patients tend to increase their activities automatically – so there is usually no need to ask patients to increase their activity levels by the prescriber.

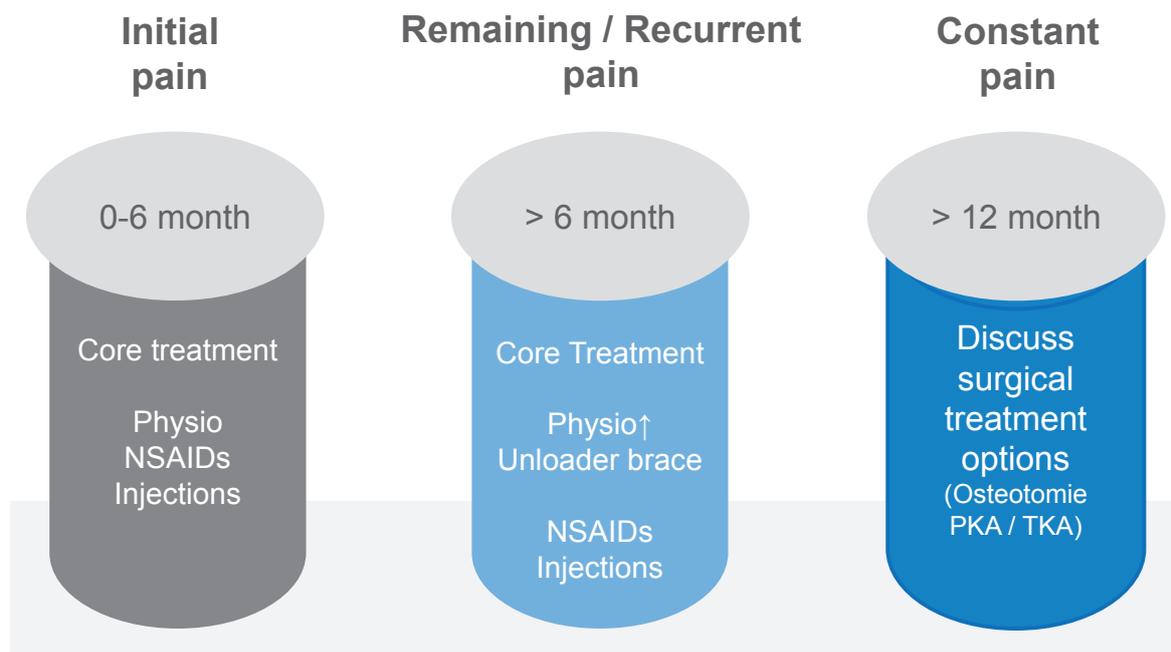
How to include Unloader braces within individual non-surgical knee OA management?

In general a stepped care approach should be considered to address patients' needs. A stepped care approach is related to the symptoms of knee OA and includes treatment of initial, remaining/recurrent and constant knee OA pain (picture 1).

Treatment of initial knee OA pain (at GP level) is based on adequate diagnostic (x-ray) including adequate x-ray diagnostic and guideline recommended core treatment (education, strength training, exercise (+ body weight management if applicable)). In case of knee effusion, synovitis NSAID and corticosteroid injections are indicated as short term treatment, if no contraindications exist.

In case initial treatment is not delivering sufficient pain relief and improvement of knee function, patients should be referred to an orthopedic specialist. Additional treatment is indicated by increasing physiotherapy and in case of varus/valgus knee OA adding an Unloader brace to the treatment of the remaining/recurrent pain. Unloader braces should be combined with other appropriate treatment options such as education, strength training, physiotherapy and body weight management. In addition, pharmacological treatment option such as NSAIDs / Cox2-inhibitors and corticosteroid injections in case of inflammation and effusion can be used. If required, additional diagnostics with scintigraphy or 2-3Tesla MRI scan should be considered to identify fulminant synovitis and avascular necrosis / significant meniscal injury.

Observing a progression of knee OA and constant pain despite individualized treatment over weeks partial / total knee replacement should be discussed with the patient.



Picture 1: Stepped Care approach knee OA Kellgren Lawrence I-III°

(Core Treatment: patient education, strength training, weight management; PKA: partial knee arthroplasty; TKA: total knee arthroplasty)

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