

NON-SURGICAL MANAGEMENT OF HIP OSTEOARTHRITIS – IMPLEMENTATION OF A NOVEL SOLUTION TO MODIFY THE BIOMECHANICS OF THE OSTEOARTHRITIC HIP

Axel Schulz , Vivian Smeets and Micah Nicholls.

Introduction

Hip Osteoarthritis (OA) imposes a significant burden on affected individuals and the community through reductions in quality of life, in addition to substantial health care costs¹. At the age of 85 the life-time risk for hip OA is 25%. The risk of undergoing total hip replacement with end-stage hip OA is almost 10%^{2,3}.



Hip OA Management

Mild to moderate hip OA (not associated with femoral acetabular impingement or hip dysplasia) is usually asymptomatic. Symptoms are often reported in later stages of hip OA, where osteoarthritic changes are already present. The goal of non-surgical management of hip OA is to provide symptom relief, and prolong or improve quality of life. It should be clearly stated that non-surgical management of hip OA is not indicated for end-stage hip OA patients, and that some patients with moderate hip OA require total hip arthroplasty (THA) if non-surgical treatment fails.

Limited clinical data is available for the non-surgical management of hip OA. Guidelines from international bodies such as the American College of Rheumatology (ACR), European League Against Rheumatism (EULAR) and others, mainly focus on knee OA, with evidence-based treatment recommendations generalized to hip OA^{4,5}. The guidelines for non-pharmaceutical and pharmaceutical treatment of symptomatic hip OA recommend an individual, assessment based, integrated package of care. This should consist of a core treatment, and specifically selected additional treatment options based on the patient's symptoms and joint function.

Core treatment

Recommended core treatment includes patient information and pathology education, physical activity, weight loss, and potential lifestyle adaptations. The current evidence for physiotherapy is

equivocal. If physiotherapy is indicated, it should be undertaken as physiotherapist-led exercise rather than web-based training⁶. No significant difference has been demonstrated between physiotherapy and non-specific treatment⁷.

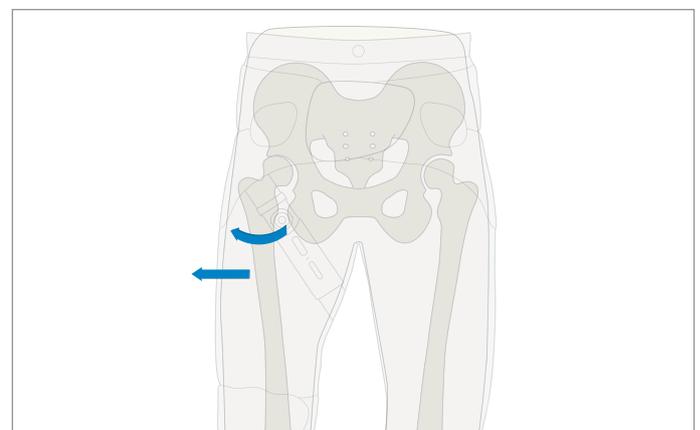
Additional treatment

Pharmacological treatment

The evidence for the use of paracetamol (acetaminophen), as recommended in current guidelines⁵, is somewhat equivocal. A recently published robust meta-analysis has concluded that the effect of paracetamol is clinically insignificant, even in the short-term⁸. Orally administered NSAIDs (i.e. diclofenac or etoricoxib) are often prescribed to provide pain relief in symptomatic hip OA. However, potential side effects necessitate that they be used in the short-term only, particularly by elderly hip OA patients⁸. Weak opioids can be beneficial, but have limitations due to side effects. Intra-articular injections of corticosteroids are proven to have a significant effect in the first week following injection, but the effect decreases over time⁹. Injections of corticosteroids are particularly recommended for patients with severe symptoms, and inflammation of the joint capsula/joint effusion. The intra-articular injection of hyaluronic acid is considered controversial, and further clinical trials with a clear protocol are needed. Platelet-rich plasma (PRP) as an intra-articular injection may be an interesting treatment option but, as is the case with hyaluronic acid injections, further evidence is required to determine its clinical benefit¹⁰.

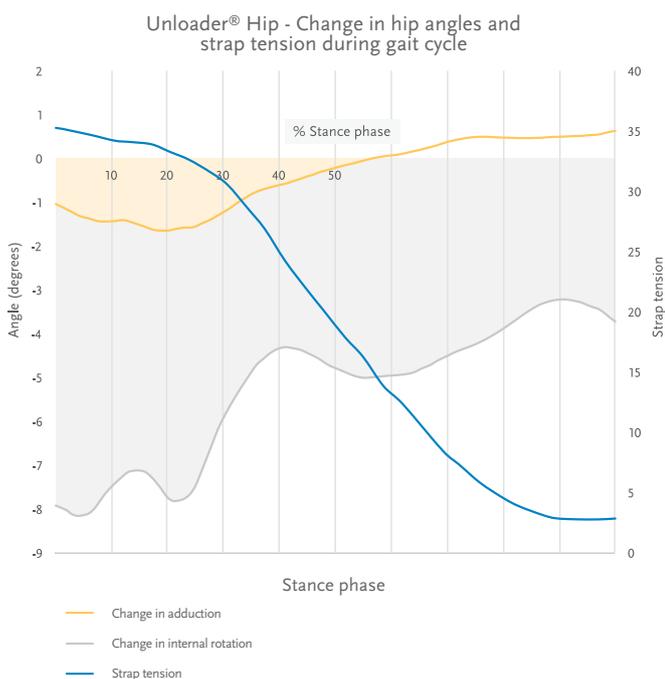
Biomechanical modification

In contrast to the knee, biomechanical modification of the hip is uncommon. However, the recently launched Unloader[®] Hip brace (Össur, Reykjavik), attempts to replicate the effect of a rotational osteotomy of the femur. With a belt compressing the pelvis, a strap



The Unloader[®] Hip brace provides an external rotation and abduction of the femoral head.

wraps from the ilium (anteriorly and medially) around the thigh, connecting with a strap on the medial side of the knee. When tightened, this strap applies an external rotation and abduction force on the hip.

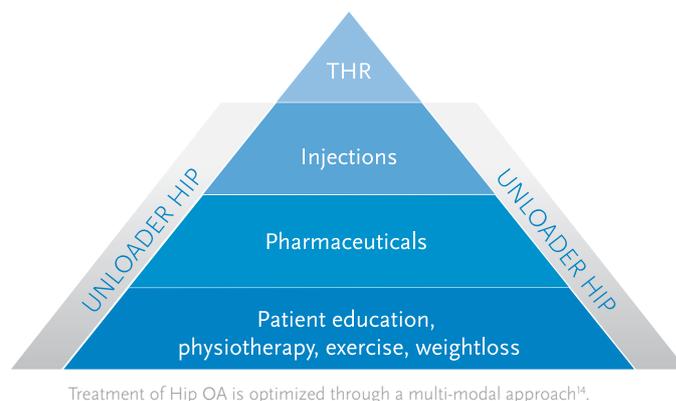


Nerot and Nicholls (2016) performed a biomechanical assessment of the effects of the Unloader® Hip brace on a cohort of 14 subjects with hip OA. They showed that wearing the brace reduced adduction and internal rotation during gait. There was also decreased internal abduction moment, which may indicate a reduction in load through the femoral head. The authors hypothesized that these biomechanical changes were responsible for the immediate reduction in pain experienced by the majority of subjects while wearing the brace¹².

Clinical results also show benefits of the Unloader® Hip in comparison to a placebo brace. A randomized controlled trial of the Unloader Hip with a one-month follow-up was undertaken with 45 subjects. A significant increase in function was found between baseline and follow-up for the group using the Unloader® Hip brace¹³.

Conclusion

Non-surgical management of hip OA is initiated when relevant osteoarthritic changes are present. The goal of hip OA management is to relieve symptoms and increase mobility. Interventions that enable patients to actively manage their hip OA have been shown to improve patient outcomes, therefore patient education surrounding their pathology is important¹¹. The management of hip OA consists of a non-pharmacological core treatment focusing on: patient information, pathology education, adaptation of lifestyle, exercise, and body weight optimization where necessary.



Treatment of Hip OA is optimized through a multi-modal approach¹⁴.

Use of oral pharmaceuticals should be limited to suitable patients, and administered for as limited duration as possible due to the risk of side effects. Intra-articular injection of corticosteroids provide short-term pain relief, but have limitations for treatment of chronic OA. While research on the Unloader® Hip is still in its infancy, results to date suggest that the brace improves patient function. They further suggest that this improvement is mediated by alterations in hip position and loading during gait.

References

- Zhang W, Nuki G, Moskowitz RW, Abramson S, Altman RD, Arden NK, et al. OARSI recommendations for the management of hip and knee osteoarthritis: part III. Changes in evidence following systematic cumulative update of research published through January 2009. *Osteoarthritis Cartilage* 2010;18:476–99.
- Murphy LB, Helmick CG, Schwartz TA, et al. One in four people may develop symptomatic hip osteoarthritis in his or her lifetime. *Osteoarthr Cartil*. 2010;18(11):1372–9.
- Culliford DJ, Maskell J, Kiran A, et al. The lifetime risk of total hip and knee arthroplasty: results from the UK general practice research database. *Osteoarthr Cartil*. 2012;20(6):519–24. Fernandes L, Hagen KB et al. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis *Ann Rheum Dis* 2013;72:1125–1135
- Hochberg MC, Altman RD, April KT, et al. American College of Rheumatology 2012 recommendations for the use of nonpharmacologic and pharmacologic therapies in osteoarthritis of the hand, hip, and knee. *Arthritis Care Res*. 2012;64(4):465–74.
- Bennell KL, Buchbinder R, Hinman RS. Physical therapies in the management of osteoarthritis: current state of the evidence. *Curr Opin Rheumatol*. 2015;27(3):304–11.
- Bennell KL, Egerton T, Martin J, et al. Effect of physical therapy on pain and function in patients with hip osteoarthritis: a randomized clinical trial. *JAMA*. 2014;311(19):1987–97.
- Da Costa BR, Reichenbach S, Keller N, et al. Effectiveness of non-steroidal anti-inflammatory drugs for the treatment of pain in knee and hip osteoarthritis: a network meta-analysis. *Lancet*. 2016;387(10033):2093–105
- McCabe PS, Maricar N, Parkes MJ, Felson DT, O'Neill TW. The efficacy of intra-articular steroids in hip osteoarthritis: a systematic review. *Osteoarthr Cartil*. 2016;24(9):1509–17.
- N. J. Murphy J. P. Eyles D. J. Hunter Hip Osteoarthritis: Etiopathogenesis and Implications for Management *Adv. Ther*. Published online Sept 2016.
- Wang SY, Olson-Kellogg B, Shamlivan TA, Choi JY, Ramakrishnan R, Kane RL. Physical therapy interventions for knee pain secondary to osteoarthritis: a systematic review. *Ann Intern Med* 2012;157:632–44.
- Nerot A., Nicholls M. Clinical study on the unloading effect of hip bracing on gait in patients with hip osteoarthritis. *Prosthet Orthot Int*. 2016 Apr 26. pii: 0309364616640873. [Epub ahead of print]
- Nicholls M, Lindgren K, Kristjansson K., Gudmundsdottir S, "Bracing for hip osteoarthritis," *Orthopädie + Reha-technik World Congress*. [Presentation]. Leipzig, 2016
- Adapted from review by Creamer P, Hochberg MC "Osteoarthritis" *Lancet*. 1997 Aug 16;350(9076):503-8.