

Brace and patient selection a key to success in OA knee braces

William Schaefer CO

Introduction

Until recently, the only braces typically considered for the conservative treatment of knee osteoarthritis were unloading or off-loading braces. These braces fail to treat some common symptoms in the OA knee like bilateral joint line pain and patellofemoral pain. With the introduction of the Global Knee™ from Hely & Weber, we now have bracing options to address patients in all stages of knee OA disease progression including those suffering from associated patellofemoral pain.

The increasing need for use of OA Knee Bracing

Most academic societies agree that OA bracing is effective on specific patients. Recent Medicare regulations are even encouraging brace utilization as a form of conservative treatment prior to Total Joint Reconstructions¹. We all know that OA is more prevalent in older people² and we have seen the incidence of OA in younger patient's increase³. There is a growing need for conservative care options for OA patients and the American Academy of Orthopedic Surgeons treatment recommendations for less invasive alternatives to knee replacement⁴ do not offer clear guidance for the patient who needs knee stability and non-pharmacological pain relief. Thus, braces that are designed to treat uni, bi and tricompartmental knee OA and its debilitating symptoms are in high demand.

The need for different braces to treat OA symptoms

Knee OA patients are often asymptomatic for the classic pain for which we use off-loader bracing. Many of these patients experience significant patellofemoral pain and swelling. Addressing patellar pain by altering patellar position, increases contact area between the patella and femoral trochlea and lowers contact stress at the patella femoral joint during weightbearing.⁵ Addressing swelling and the maltracking patella is an important option to have in a brace to treat knee OA patients with conservative care prior to their disease process advancing to surgical interventions.

Brace and Patient Selection is Key to success in using OA Knee Braces

Because all patients are unique and each has specific symptom and characteristics it is very important to identify which brace will benefit the patient for the greatest outcomes. On initial evaluation of an OA knee patient we evaluate all available clinical data including referring physician notes, radiology reports and images. We also perform a full evaluation including pain scale, range of motion, instability testing, manual muscle testing, biomechanical gait analysis, patella grind, and an objective pain location assessment.

On severe knee OA patients, laxity in the OA knee does not necessarily relate to instability⁶. This is not surprising as the heavily diseased joint is characterized by a loss of articular cartilage, remodeling of subchondral bone, osteophyte formation, ligamentous laxity, weakening of periarticular muscles, and thickening of the joint capsule⁷. While passive laxity, stiffness, and joint instability are not the same, it is possible that a low-stiffness knee, when exposed to high frontal plane moments during ambulation^{8,9,10} may experience joint instability¹¹. We call this functional instability or what the patient experiences during ambulation and weight bearing, and it can be objectively seen and measured through observational biomechanical gait analysis. Hinges for support and stability will help this patient ambulate blocking a peak varus/valgus moment from occurring.

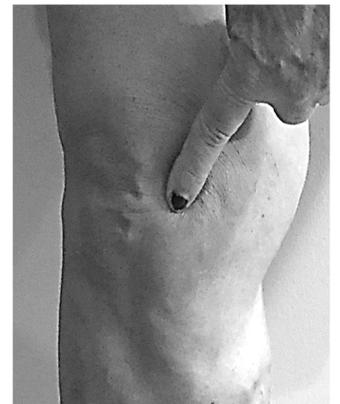
During the evaluation, we ask a rather simple question about the pain the patient is experiencing. Asking the patient to use only one finger, we ask them to indicate the exact location of their pain. When they point to the medial or lateral joint line (Picture 1), we know an unloader/off-loader brace will be an effective modality as they display classic medial joint line pain. When the patient points to their patella or just inferior to the patella (Picture 2), however, we needed a viable option to treat this symptom with a knee brace as a pain and bio-mechanical modality. We found it in the Global Knee™ which assists with instability and controls patellar movement.

A radiographic example of this shows the patient in Picture 3 displaying a classic presentation of an OA knee in need of an off-

Picture 1



Picture 2



Picture 3



Picture 4



loading brace. Further analysis of this patient, however, shows in a lateral view for the same patient, one who pointed to their patella or just inferior to their patella when referring to the presentation of their pain, a very clear bone spur formed on the patella and bi compartmental knee OA. That spur, when the quadriceps muscles are activated, catches and drags its way into position. The patient experiences significant anterior knee pain during this contraction demonstration. Activities such as stair climbing can cause significant pain. Lifting and elevating this patella with a patellar sling strap, sometimes with a slight lateral tension along with hinges for stability, seems to alleviate the majority of this patient's patella femoral pain. With the Global Knee™ (Picture 5) we can treat the symptomatic painful patella and provide stability for the functionally unstable joint yet one that is asymptomatic for bone on bone pain.

Picture 5



Summary

Matching the brace to the patient should consider the patient's pain, location of the OA, degree of instability, and lifestyle needs. Using these criteria for brace selection has shown to improve our outcomes and allow us to achieve better patient compliance when pain location is directly correlated to brace selection. The Global Knee™ is designed specifically to do this. With both unloading/off-loading braces and the Global Knee now available, almost all symptoms can be treated effecting the OA Knee. With that said, it now becomes even more important to identify to the proper brace selections for the patient diagnosis and symptoms. Consideration of the patient's activity level, ability to tolerate a brace, and which symptom the patient is experiencing is not only important, but vital to successful outcomes.

About the Author and Clinician:

Bill Schaefer is a certified orthotist who has been in private practice, served as an orthotist at the Philadelphia VA Hospital, and now is employed as an orthotist for Synergy Orthopedics. He has been a practicing orthotist for over 35 years. Bill has no disclosures other than the company he works for is the distributor of Hely & Weber the manufacturer of the Global Knee™ in New Jersey and Eastern Pennsylvania.

¹Documenting Medical Necessity for Major Joint Replacement (Hip and Knee)

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²Why is Osteoarthritis an Age-Related Disease?

Anderson, A. Shane, Loeser, Richard F. Best Pract Res Clin Rheumatol. 2010 Feb; 24(1): 15.

³Osteoarthritis in Young, Active, and Athletic Individuals

Amoako, Aadae O, A Pujalte, George Guntur, 2014 May 22. Clin Med Insights Arthritis Musculoskelet Disord. 2014; 7: 27–32.

⁴AAOS Clinical Practice Guideline Summary, Treatment of Osteoarthritis of the Knee - 2nd Edition_May 18, 2013

⁵A knee brace alters patella position in patellofemoral osteoarthritis: a study using weight bearing magnetic resonance imaging.

Callaghan MJ, Guney H, Reeves ND, Bailey D, Doslikova K, Maganaris CN, Hodgson R, Felson DT. Osteoarthritis Cartilage 2016 Dec;24(12):2055-2060.

⁶Instability, Laxity, and Physical Function in Patients with Medial Knee Osteoarthritis

Schmitt, Laura C , Fitzgerald, G Kelley , Reisman, Andrew S , Rudolph, Katherine S Phys Ther. 2008 Dec; 88(12): 1506–1516.

⁷Kelley's Textbook of Rheumatology. 9th ed

Firestein GS, Kelley WN. . Philadelphia, PA: Elsevier/Saunders; 2013

⁸Increased knee joint loads during walking are present in subjects with knee osteoarthritis.

Baliunas AJ, Hurwitz DE, Ryals AB, Karrar A, Case JP, Block JA, Andriacchi TP: Osteoarth Cart. 2002, 10 (7): 573-579.

⁹Kinetic and kinematic characteristics of gait in patients with medial knee arthrosis.

Gok H, Ergin S, Yavuzer G: Acta Orthop Scand. 2002, 73 (6): 647-652.

¹⁰The knee adduction moment during gait in subjects with knee osteoarthritis is more closely correlated with static alignment than radiographic disease severity, toe out angle and pain.

Hurwitz DE, Ryals AB, Case JP, Block JA, Andriacchi TP: J Orthop Res. 2002, 20 (1): 101-107.

¹¹Self-reported knee joint instability is related to passive mechanical stiffness in medial knee osteoarthritis

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