

Using Orthotics Made Easy: Medial Knee Pain

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Knee pain is a common condition experienced by people of all ages, and levels of activity. Knee pain is a problem that can be experienced due to many contributing factors, including: increased Q-angle, genu-valgum and genu-varum, muscle tightening through the gastrocnemius, iliotibial band and VMOs, hyper-extension of the knee and tibial rotation and torsion.

Symptoms may include:

- Knee locking
- Knee 'clicking'
- Knee stiffness
- Difficulty bending and extending the knee
- Pain around the patella

When discussing knee pain, terms such as 'Retro Patella pain', 'Patella Femoral Dysfunction', 'Medial Compartment Syndrome' or 'Ilio Tibial Band Friction Syndrome', come to mind. However, all these conditions are simply descriptions of knee pain. When I treat patients suffering knee pain I always keep in mind that the knee sits between the hip and the foot. Thus, I have found that anything affecting the hip, will in turn affect the knee. Conversely, whatever affects the foot, will invariably have an impact on the knee.

It is important to be aware that if the patient's pain is idiopathic (i.e.. no known trauma), both pronation and

supination may be the underlying cause of the problem - as outlined by Michaud, 1997. Michaud states that for every 1° of pronation the tibia internally rotates 1°, which in turn impacts on the knee joint, as it takes the stress that is generated by the tibial rotation.

Tibial rotation is totally different to tibial torsion. Tibial Torsion is a twisting in the osseous structure of

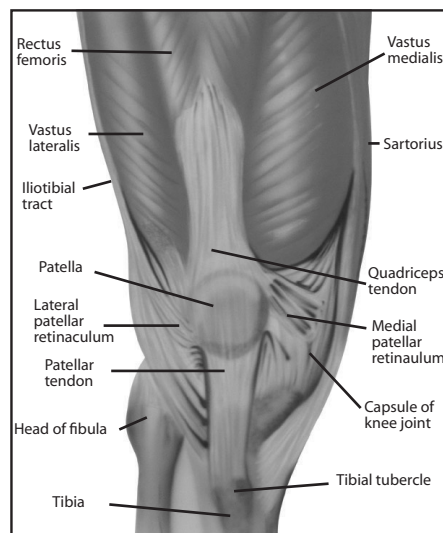


Figure 1: Ligamentous & muscular attachments of the patella.

the tibial shaft. Internal Tibial rotation is associated with excessive pronation, medially displacing the patello-femoral path and encouraging lateral displacement of the patella. Internal Tibial Rotation is a common problem and elicits pain under and around the medial aspect of the patella - especially with excess loading activities such as running and jumping.

Internal tibial rotation is also responsible for creating medial collateral strain to the ligament structures that wrap around the medial aspect of the

knee and lower leg (Cosgarea, 2002).

To treat pain associated with internal tibial rotation, you can give VMO strengthening exercises, knee strapping, and other strengthening exercises - all of these are valuable treatment options, however, they only treat the symptoms. As practitioners we must treat the cause of the condition, not just the symptoms.

CAUSES OF MEDIAL KNEE PAIN

Excessive pronation causes the medial collateral ligament to elongate resulting in the VMOs weakening and the ITBs tightening, causing external rotation of the femur as compensation. The patella ends up tracking on the lateral aspect of the femoral condyle and a grinding and crackling feeling is felt on the flexion to extension.

Strapping using the McConnell technique and strengthening VMOs is a good treatment method, however it will not correct the problem - strapping will only assist in pain relief, and the condition will constantly re-occur until the knee has degenerated or become Osteo-Arthritic, which will require surgical intervention.

A basic requirement to reduce rotational stress on the knee is STJ and MTJ control and correction.

BIOMECHANICAL TREATMENT

- McConnell strapping technique to control lateral/medial patella displacement, in conjunction with low dye strapping to mimic the support and control of an orthotic device. Low dye strapping, however, is only a temporary treatment.

Figure 2: Low Dye strapping is a temporary method to mimic an orthotic



Figure 4: Rearfoot additions - 2° and 4°. Used to maintain the NCSP and alignment with the tibia.

- ICB Orthotics moulded to the patient's NCSP (Neutral Calcaneal Stance Position) to control abnormal STJ and MTJ pronation, by aligning the calcaneus with the lower 1/3 of the tibia and limiting the joint to its original function as a hinge joint.

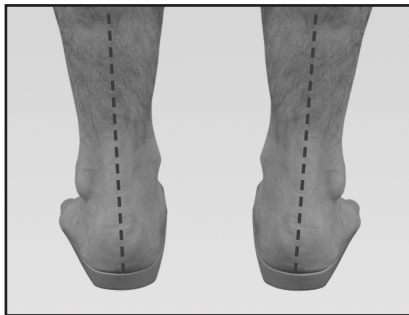


Figure 3: Correct the rearfoot to neutral and mould the orthotic.

- Strengthening VMO exercises whilst correcting the feet with orthotics, and stretching the ITBs.
- Mobilisation of the knee joint may also be useful.
- Acupuncture at the point of pain to aid pain relief.
- Runners may require increased rearfoot varus wedging to compensate for the higher tibial varum angle at heel strike to the ground, during the running cycle.

REFERENCES:

COSGAREA, A.J., BROWNE, J.A., KIM, T.K. & MCFARLANE, E.G. (2002) Evaluation and Management of the Unstable Patella, *The Physician and Sports Medicine*, 30, 10

MCCONNELL, J., & COOK, J. (2001) Anterior Knee Pain, *Clinical Sports Medicine*, 2nd Edition, [<http://www.clinicalsportsmedicine.com/chapters/24a.htm>]

MICHAUD, T.C. (1997) *Foot Orthoses and Other Forms of Conservative Foot Care*, Sydney: Williams & Wilkins

PETERSON, L., & RENSTROM, P. (1986) *Sports Injuries: Their Prevention and Treatment*, Sydney: Methuen Australia