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Prevention, Diagnostics, Therapy, Rehabilitation & Medical Technology

Jonas Reckermann
won gold in Beach Volleyball at the 2012 Olympics. Five months later he ended his professional career at 33 on account of back problems.

→ **Offprint**

Patellofemoral Pain Syndrome

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Patellofemoral Pain Syndrome

A multimodal therapeutic approach

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Patellofemoral pain syndrome (PFPS) is a frequent cause of "front of knee pain". Physically very active women without significant pathological changes to articular cartilage form a key risk group. PFPS is thought to be triggered by overburdening the patellofemoral joint (e.g. sport-based stress from training too hard).

Patients with PFPS suffer from retro- and/or peripatellar pain, which worsens during activities involving heavy use of the patellofemoral joint – such as walking, running, climbing stairs, squatting and prolonged sitting. PFPS is generally caused by a functional misalignment where the knee joint assumes a valgus position due to inner rotation of femur and tibia. This results in decentralisation of the patella. The root cause of the functional misalignment is often weak external hip rotators and hip abductors plus insufficient torso stability. Malposition of the foot may also be considered. Muscular imbalances in parts of the quadriceps, contractures of the iliotibial band and the ischiocrural muscles present as secondary conditions, and can both worsen and sustain PFPS. The result: a vicious circle.

PFPS treatment options

Since PFPS patients do not present with structural damage, surgical options cannot be used to alleviate the complaint. PFPS treatment is first and foremost conservative, is often prolonged and does not meet the expectations of physician or patient.

Multimodal treatment approach

Evidence-based treatments include a range of conservative therapy options. Alongside physio-

Fig. 1: Cooling of quad tendon

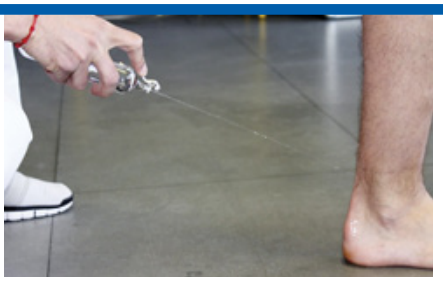

Fig. 2: Cooling of Achilles tendon

Fig. 3: Patella Pro recentering orthosis (Otto Bock HealthCare)

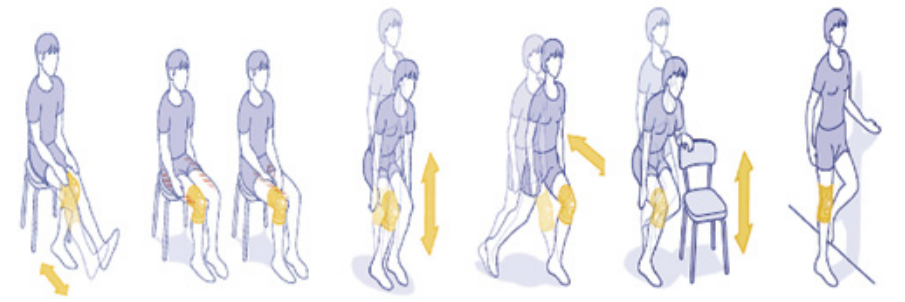

Fig. 4: Home training programme with orthosis (illustration: Otto Bock HealthCare)

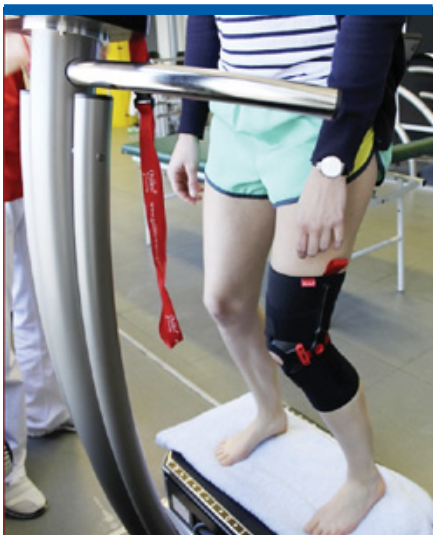

Fig. 5: Galileo vibration training (Novotec)

therapy (specialised weight/neuromuscular training both with and without resistance), this also includes care plans using tape, orthoses, inserts and pharmacological treatment options (nonsteroidal anti-inflammatory drugs). The primary treatment goals here are to reduce pain and improve muscular function. This set of goals can be achieved only with a targeted, multimodal treatment approach. Reducing pain first requires amelioration of the neuromuscular stiffness in the affected lower extremities, in conjunction with passive support for the alignment of the patella. This approach can achieve pain reduction for PFPS patients in as little as one week.

The multimodal therapeutic approach described here includes the following therapeutic strategies (Figure 6):

// **Specialised physiotherapy**
targeting correction of functional misalignment (stability of the torso/pelvis, thigh and lower leg).

// **Gluteal tape (McConnell method; Figure 7):**
Gluteal tape (McConnell method) can help strengthen the extension and outer rotation of the femur, thereby countering the functional misalignment.

// **Short-term cooling of patellar and Achilles tendon with ethyl chloride (Figures 1 and 2):**
Cold applications using ethyl chloride have a positive effect on blood supply and metabolism, thus increasing the efficacy of the subsequent training session.

// **Fitting patient with the "Patella Pro" recentering orthosis (Figure 3):**
The Patella Pro is a specialised recentering orthosis that works by progressively countering patella lateralisation at the relevant angle of flexion and thus having a positive effect on pain felt.

// **Six-minute full-body vibration training (Figure 5):**
The vibration training utilised is a type of weight training. Immediately after a local cold application, training can then proceed at a higher degree of intensity.

// **Completion of the "Patella move" programme by the patient (Figure 4):**
This programme contains a series of easy-to-follow exercises for reducing pain, improving muscular strength, coordination and balance.

It is essential that the individual therapy modules in each treatment unit are performed strictly in sequence. McConnell method gluteal tape is applied at the start of each therapy unit and worn until the next treatment. Following completion of taping, a cold spray is used to cool the patellar and Achilles tendon for 10 seconds. Immediately following application of the cold spray, patients should then wear the recentering orthosis on the affected knee for 6 hours daily. A six-minute

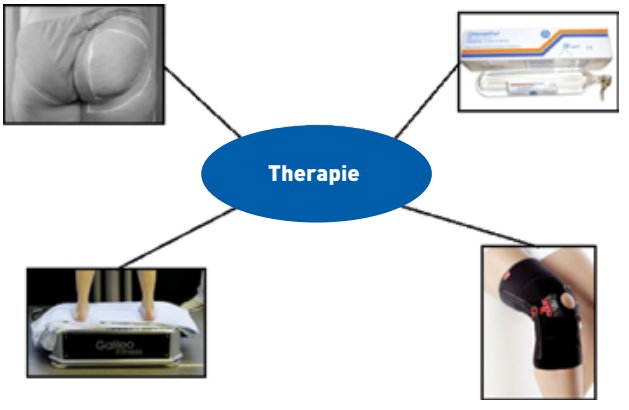

Fig. 6: Treatment algorithm

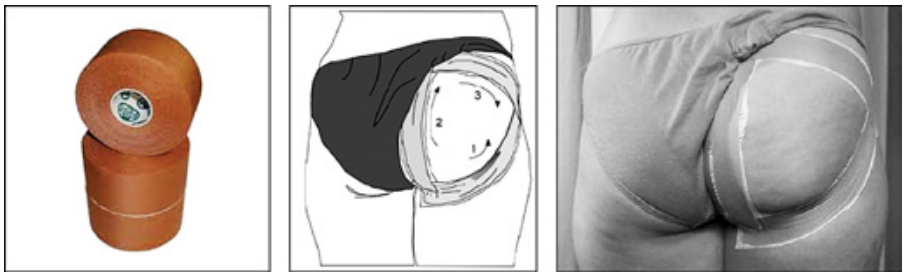

Fig. 7: Gluteal tape, McConnell method (photo: McConnell 2002)

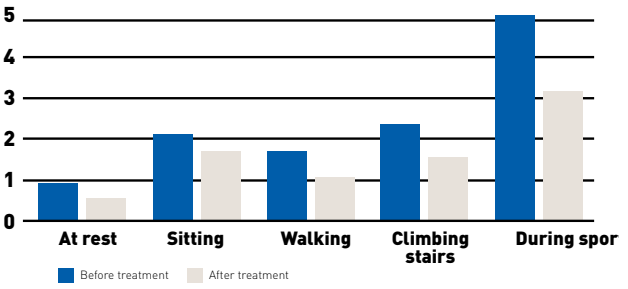

Fig. 8: Pain intensity (NAS)

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session of full-body vibration training follows, at over 25 Hz and a total amplitude of between 3 and 4 mm.

This involves patients standing with feet hip-width apart, knee joint slightly bent and an upright torso on a Galileo Fitness vibration platform. In addition to the strategies as described, patients also complete the Patella Move movement programme on their own once a day. Patients should also continue to participate in their normal sporting activities during the treatment period.

The efficacy of this programme was investigated in clinical practice using a prospective observational study with an initial cohort of ten athletes who had exhibited PFPS for an average of 27 (±17) months. After only a single week of treatment involving three treatment days, the intensity of pain felt during daily activities and sports was significantly reduced. Based on the results, further comparative observational studies with a higher sample size are to be recommended.

Summary

In summary, it can be said that the one-week multimodal treatment algorithm described – utilising physiotherapy to correct functional misalignment, gluteal tape (McConnell method), local cold applications with ethyl chloride, the fitting of the recentering orthosis mentioned, the laterally alternating full-body vibration training and the above-mentioned home training programme – can result in significant pain reduction (Figure 8) during performance of a range of dynamic activities.

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