Clinical Integration of Osteopathic Manipulative Medicine

Family Medicine: Knee pain with a focus on osteoarthritis

Author: Andrea Sarchi, OMS-IV and Sheldon C. Yao, DO

Introduction: Knee pain is a common reason for patient visits to primary care clinics and emergency departments. As the largest human joint when considering volume and surface area of articulating cartilage, the knee is highly susceptible to injury, degeneration due to age, inflammation, and infection. Therefore, there is a large range of pathology that can occur in the knee and consequently result in pain. These include periarticular bursitis, patellar dysfunctions, referred pain from the hip, femur, or spine, and intra-articular processes such as meniscal injury, ligamentous injury, or fracture, amongst others.

One particularly important condition that we must be aware of, especially in the elderly, is osteoarthritis. Osteoarthritis commonly affects the knee, and treatment consists of acetaminophen and other oral NSAIDs, topical NSAIDs and capsaicin, and intra-articular glucocorticoids. While these treatments can be very effective, manual therapy has also proven to provide significant relief to patients with osteoarthritis. Therefore, there are a number of osteopathic manipulative medicine techniques that can be applied to treating osteoarthritis of the knee.

Patient presentations and differential diagnosis: As there are numerous causes of knee pain, the presentation can vary widely. One way to classify the different diagnoses and presentations is by anatomic location:

- Medial knee pain (most common)
  - Osteoarthritis, pes anserine bursitis, medial plica syndrome, medial collateral ligament sprain, medial meniscal tear
- Anterior knee pain
  - Quadriceps injury, patellar subluxation, patellofemoral pain syndrome, patellar tendonitis, prepatellar bursitis (Jumper’s knee), tibial apophyseitis (Osgood Schlatter disease)
- Lateral knee pain
  - Lateral compartment osteoarthritis, lateral collateral ligament sprain, lateral meniscal tear, iliotibial band tendonitis
- Posterior knee pain
- Popliteal cyst (Baker’s cyst), posterior cruciate ligament injury, deep venous thrombosis
- Diffuse knee pain with inflammatory changes
  - Rheumatoid arthritis, gout, psedogout, septic arthritis

Abnormal noises such as clicking or popping that arise at the knee may indicate osteoarthritis or, in the setting of trauma, a meniscal tear.

The primary symptom of osteoarthritis is pain that is worsened by movement and relieved by rest. As the disease progresses, pain may be present with only minor movements or at rest. Morning stiffness and stiffness after inactivity are also common complaints of osteoarthritis. The diagnosis is made by the presence of knee pain and at least three of the following characteristics:

- Age >50
- Morning stiffness < 30 min
- Crepitus
- Bony tenderness
- Bony enlargement
- No palpable warmth

**Clinical pearls and diagnostic tools:**

- There are a number of special tests that can be utilized to diagnose the etiology of knee pain:
  - Varus-valgus stress test – evaluates the medial and lateral collateral ligaments
  - Anterior drawer test/Lachman maneuver – evaluate anterior cruciate ligament
  - Posterior drawer test – evaluates posterior cruciate ligament
  - McMurray test – evaluates for meniscal tears
  - Apley’s compression test – evaluates for meniscal tear
  - Apley’s distraction test – evaluates for ligemantous dysfunction
  - Knee joint effusion test (Bounce Home test) – evaluates for joint effusion
  - Patella femoral grinding test – evaluates for patellofemoral pain syndrome

**OMM Integration:** There are numerous studies illustrating the effectiveness of manual therapy in treating knee pain and osteoarthritis. In one meta-analysis study of 48 randomized trials, Collins et al demonstrated that there were beneficial effects to physiotherapy, exercise, orthoses, and acupuncture in patients with anterior knee pain. In another study, Abbott et al showed that manual physiotherapy provides benefits over standard care in treating patients with knee pain due to osteoarthritis. The benefits were sustained to 1 year. Furthermore, Ebert et al showed that manual lymphatic drainage techniques aid in the early postoperative stages after total knee arthroplasty and improve active knee flexion for up to 6 weeks postsurgery. Unfortunately, no randomized controlled trials have been performed to assess the effectiveness of osteopathic manipulative medicine in the treatment of osteoarthritis of the knee. However, many of the manual techniques used by Abbott et al were similar to OMT techniques. In addition, anecdotal evidence suggests that osteopathic manipulative treatment of the knee is beneficial in relieving
knee pain. Therefore, it is expected that OMT would provide similar benefits to those shown from studies analyzing other manual techniques.

**Osteopathic Structural Examination:** Observe the patient for any signs of trauma or swelling to the knee. Then check the patient’s posture from the front, back, and side. Note any abnormal posture, genu valgum, or genu varum. Finally, have the patient walk and observe for a limp or antalgic gait.⁹

On palpation of the knee, be sure to identify the following landmarks: patella and patellar tendon, fibular head, tibial plateau, medial joint line and medial collateral ligament, lateral joint line and lateral collateral ligament, and tibial tuberosity.⁹

Test the patient’s range of motion both actively and passively. The knee will normally flex 135 degrees and extend zero degrees. Medial and lateral rotation of the flexed knee is about 10 degrees in either direction. While testing the range of motion, monitor the patient’s knee for signs of crepitus. Such a finding is commonly seen in osteoarthritis.⁹

Lastly, the fibular head should be articulated for anterior and posterior glide. A posterior glide somatic dysfunction is the most common somatic dysfunction of the knee.⁹ While the aforementioned steps are appropriate in evaluating a patient with knee pain, be sure to also check the patient’s lower back, hip, and the rest of his/her lower extremity for dysfunctions that may be contributing or causing the pain.

**Possible Treatments Options:** The goals of treatment are to stretch the soft tissues, release tissue adhesions, improve blood flow and lymphatic drainage, decrease edema, increase range of motion, and decrease pain. The following are some of the many possible OMT treatment techniques:⁹

- Counterstrain of the knee
- Facilitated positional release of the knee
- Myofacial release and popliteal spread
- Articulatory techniques and high-velocity low amplitude of the fibular head
- Muscle energy of the fibular head, hip, and lumbar spine
- Pedal pump and use of a percussion hammer

Other effective non-pharmacologic treatments for knee pain include weight loss and exercise.⁵

**Citations and related evidence-based medicine articles:**

1. Anderson BC. Office Orthopedics for Primary Care: Diagnosis and Treatment, 2nd, WB Saunders, Philadelphia 1999.


