

PAIN RELIEF / PREVENTION

# New Knee, New Pain: Enter Chiropractic (Part 1)

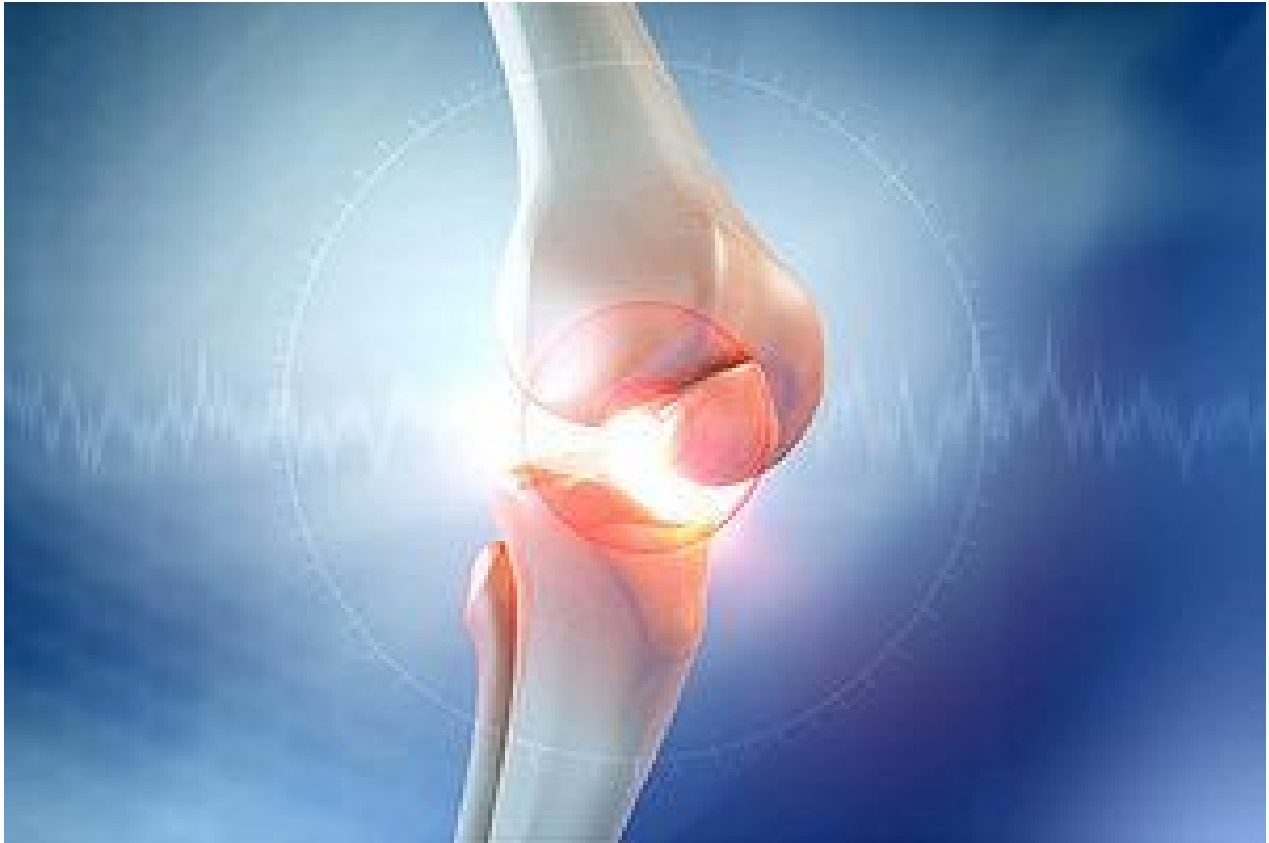
*COULD MANIPULATION BECOME THE STANDARD OF CARE FOR PATIENTS FOLLOWING KNEE REPLACEMENT SURGERY?*

Jeffrey Bentz, DC; V. Robert Agostino, EdD

Total [knee arthroplasty](#) is a common surgical procedure for providing pain relief and improved function in patients who have severe knee arthritis.<sup>1</sup> The development of arthroplasty suggests there will be a large number of postsurgical patients in various stages of recovery in the coming decade.<sup>2</sup> This article suggests treatments for this burgeoning number of potential chiropractic patients. We believe chiropractors have a crucial role in the ongoing treatment of knee implant pain, but they must have an array of techniques to offer new and continuing patients. This case study (presented in two parts) explores some diagnostic and treatment strategies using chiropractic techniques on postsurgical knee pain patients. We explore a cluster of techniques, with supporting analyses and rationales for using it. We also ask for added research and writing, even on a case-by-case basis, to establish the wider efficacy of these treatment approaches.

## Knee Implants: A Primer

A total knee replacement is a surgically implanted mechanical apparatus that replaces non-functional bone and cartilage. The lower end of the femur, the top surface of the tibia and the back surface of the patella are impacted by the metal and polyethylene components of the implant.<sup>2</sup> Although the mechanical apparatus cannot "feel" pain, there are possible complications in the muscles, tendons, ligaments, tissues and nerve networks that surround the area of the knee, generating pain.



There are approximately 543,000 total knee replacements performed each year. Between the years of 1979-2002, the rate of knee replacement procedures among those ages >65 years increased approximately eightfold. They are performed more frequently for women than men.<sup>4</sup>

Total knee replacements have become one of the most common orthopedic procedures for older people.<sup>4</sup> Invasive interventions such as arthroscopy and joint replacement surgery are considered when other treatment modalities have failed for patients who generally have more severe pain and disability with radiographic evidence of osteoarthritis.<sup>5</sup> This trend among over-65 women and men represents both a great service opportunity and a chance to expand the patient base for contemporary chiropractors.

In the case report that is the focus on this article, ligament and tendon origins and attachments were removed during the total knee replacement between the distal femur and proximal tibia to allow the mechanical joint to be implanted. The tendons that attached the muscles to the bone of the original knee had to then be reattached to the mechanical joint.<sup>3</sup>

#### Knee Pain Following Implantation

**Osteoarthritis** is a chronic degenerative disorder of multifactorial etiology, including acute and/or chronic insults from normal wear and tear, age obesity, and joint injury.<sup>6</sup> The tibia, femur, and patella are the three bones connected to articulate the knee. The meniscus is the tissue that creates a cushion between the tibia and the femur. When the menisci are torn or degeneration has occurred, they no longer act as the cushions between the tibia and the femur. Such degeneration can lead to damage of the bones themselves.<sup>3</sup>

Knee pain can also be caused by the following conditions; arthritis, Baker's cysts, bursitis, a

connective tissue disorder, dislocation of the kneecap, iliotibial band syndrome, infection of the knee joint, tear of a ligament or meniscus, tendonitis, strain or sprain, bone tumor, Osgood-Schlatter disease, etc.<sup>7</sup>

The general movements of the knee are: knee flexion initiated by the hamstrings; extension initiated by the quadriceps; medial rotation initiated by the semitendinosus, popliteus, and semimembranosus muscles; and lateral rotation initiated by the biceps femoris muscles.<sup>8</sup> Practicing chiropractors must take into account the multiple functions of the muscles surrounding the knee, especially in an arthroscopic patient. The muscles surrounding the knee joint have proximal and distal attachments to the iliacus, femur, tibia and fibula.<sup>9-10</sup>

A chiropractor treating post-implant knee pain must make absolutely sure that the tissues, muscles and nervous tissue around the knee have healed adequately; although many knee arthroplasty patients walk well within one or two months after surgery, the patient in this case observed that his healing processes were incomplete until 10 or more months later.<sup>11</sup>

Similarly, a knee implant is tightly connected to the ipsilateral hip complex; manipulations on the knee can impact the hip socket and surrounding tissues and muscle. The competent chiropractor must take a holistic approach to the entire hip-knee-ankle-foot articulations before manipulating the knee using the following techniques.

#### The Case Report: Background

The focus of this case report is the patient's left knee. The patient is a recently retired professor with a complete left knee arthroplasty. In the mid-1990s, he was already planning his campus walking to the flattest routes and fewest stairs. During the spring and summer of 2003, the patient's left knee cartilage deteriorated with much pain. His classroom mobility devolved from actively moving about the classroom to limping into class on a cane and sitting almost immobile, unable to stand for even five minutes, because of the pain.

Early "remedies" included Ace bandages, knee braces, shoe inserts, capsaicin creams, ice, heat and massage therapy. Before the surgery, injections of Synvisc, physical therapy, exercises, electrical stimulation treatments, and NSAID pain medication did nothing to lessen the constantly increasing pain or restore his mobility.

On Dec. 10, 2003, the patient had left knee arthroplasty. The device used was the Genesis II implant. (Technical specifications for this implant are available from the [Smith-Nephew Co. website](#).) The surgery was done by a team from a leading orthopedic practice, with a lead surgeon who has operated on several hundred knees and hips. The patient's medical insurance allowed for three days of physical therapy in the hospital and an additional seven days in a special recovery unit at the hospital for post-operative knee implant patients.

After 10 days of in-hospital physical therapy and later extensive outpatient rehabilitation therapy, it was 10 months before the patient's pain lessened to normal and his gait was restored. Physical therapy took place in an out-patient setting, housed in the professional office building adjoining the hospital. The therapists were excellent overall, with extensive experience, good training, continuing-education training and excellent patient care skills.

Over the intervening years (2004-2010), the left knee pain would occasionally flare up and the usual medical treatments were prescribed: physical therapy, exercises and NSAIDs. This case study details the 2010 chiropractic treatment of what had become an uncomfortable pattern of

flare-ups and incomplete remissions. To complicate matters, in 2005 and 2009 the patient had his hips replaced. Re-establishing gait and balance and pain management had to continue while the hip surgeries were healing. The patient was unpleasantly surprised in early 2010 when the knee pain erupted again, two years into his retirement from university life.

During the spring of 2010, the patient's left knee began to ache and then eventually became painful, to the point that daily activities were affected. Even on vacation, much to the patient's disappointment, soaking the left knee in the warm waters of the Gulf of Mexico did not cure or even lessen the pain. The orthopedic surgeon who had performed the original surgery recommended another round of extensive physical therapy to strengthen the leg and knee.

The patient scheduled 12 visits of physical therapy that consisted of ultrasound, electrical muscle stimulation, heat and ice sessions, stationary bike exercise, treadmill, stepping machines, and massage, along with pre- and post- ranges-of-motion measurements. However, the pain did not lessen.

At the end of one of the PT sessions, the patient asked the therapist if anything could be done directly to the knee that might lessen the pain. The physical therapist pulled the leg straight back away from the patient's body, which produced the first mitigation of the pain in about six months.<sup>11</sup> The patient recognized this motion as a manipulation a chiropractor might use. He left the PT session with much less pain in the knee and a resolve to discuss this with the surgeon.

Some authors have associated the development of patellofemoral pain with malalignment of the patella within the femoral trochlear groove.<sup>12</sup> It can be hypothesized that joint mobilization might activate segmental pain inhibitory mechanisms.<sup>13</sup> In a watershed book called *Peripheral Manipulation*, Geoffrey Douglas Maitland described a five level amplitude scale that included four levels of mobilization and one level of manipulation. We include Maitland's scale, discussed later, because "the grading system helps to standardize treatment and make communications between practitioners easier and more precise."<sup>14</sup>

The patient reported the PT result to his orthopedic surgeon, who recommended chiropractic care. The chiropractor to whom he was referred had a history of working with this orthopedic surgeon's patients. In consultation with the patient, this case study evolved, with both parties learning about the uses of chiropractic manipulation to lessen the knee pain and discomfort.

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*Editor's note:* Part 2 of this article is scheduled to appear in the March 1 issue and includes complete references for both parts.

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