

KineMatch® Case Studies

Normal Trochlear Anatomy

Our experience with patient-specific patellofemoral arthroplasty dates back to 1995. Patients in our cohort generally fall into one of two categories: those having a “normal” femoral trochlear sulcus angle, with or without patellar tilt; and those having a femoral sulcus angle greater than 145°, i.e. a shallow or even convex trochlea – dysplastic trochleas will exhibit a crossing sign on a true lateral radiograph (Bollier and Fulkerson, 2011). These case studies serve as illustrative examples.

Patient J.O. is a 49 year old male who initially presented with severe anterior knee pain 14 years ago after sustaining a twisting injury to his knee that was treated with arthroscopic surgery followed by a soft tissue realignment procedure two years later. During this time, he developed progressive and disabling anterior knee pain. He could not walk up or down stairs without assistance and could not kneel, squat or climb without severe pain.

Physical examination revealed severe anterior knee tenderness with severe crepitus and grinding in the retro-patellar space. He had no ligament instability and no medial or lateral joint line tenderness. All provocative tests for meniscal and ligamentous injury were negative. The radiographs revealed severe patellofemoral arthritis and no medial or lateral joint line abnormalities (Figure 5).

The patient was initially treated with medications, heat, physical therapy and Hyalgan injections without relief, and he remained symptomatic and disabled. In October 2009, he underwent a patient-specific patellofemoral arthroplasty of the right knee (Figure 5).

Post-operatively, he has done remarkably well and has returned to his previous employment at the Los Angeles County Sheriff's Department. He currently has no pain and does not require any medications. He can ambulate up and down stairs without assistance and can kneel, squat and climb without pain.

We thank Domenick Sisto M.D. (Los Angeles, CA) for contributing this case report.

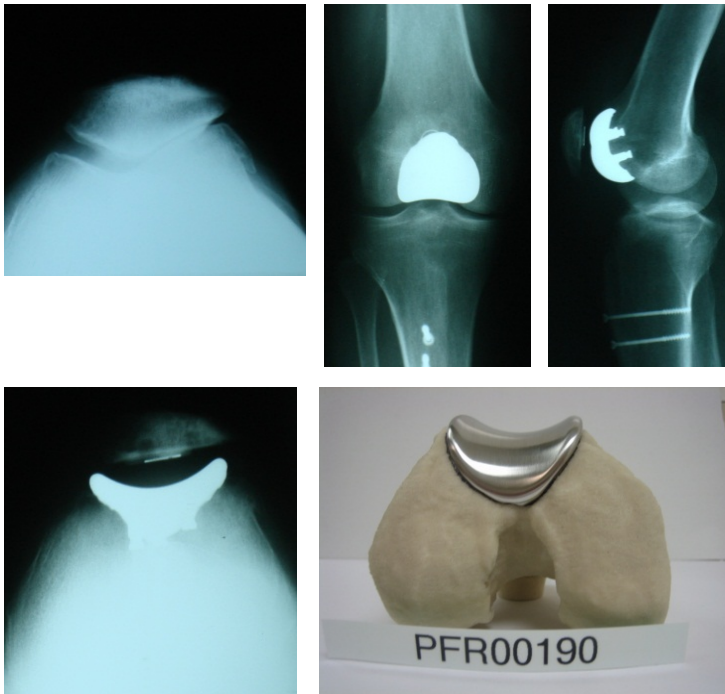


Figure 5. A 49 year old male with isolated end-stage patellofemoral arthritis, without evidence of trochlear dysplasia as seen in pre-operative Merchant view (top-left), treated with a patient-matched patellofemoral prosthesis and all-polyethylene patella button. Post-operative anterior-posterior (top-middle), lateral (top-right), and Merchant (bottom-left) views demonstrate proper orientation of patellofemoral prosthesis. Placement, fit, and alignment of the patient-specific trochlear implant was confirmed by the manufacturer using the patient-specific CT bone model prior to final polishing (bottom-right).

Trochlear Dysplasia

Patient D.B. is a 56 year old woman with anterior knee pain since her teenage years. Non-operative treatments had included activity modification, prescription and over-the-counter pain medications, steroid and visco-supplementation injections, nutritional supplements, and physical therapy. Serum laboratory studies had not been suggestive of inflammatory arthritis.

Imaging studies demonstrated severe patellofemoral dysplasia and an absence of arthritis outside the patellofemoral compartment (Figure 6). She had undergone arthroscopies of both knees. She underwent patient-specific patellofemoral arthroplasty in September 2008 for her right knee and in December 2008 for her left knee.

Despite the chronically subluxed position of her patellae pre-operatively, an extensive intra-operative lateral release and medial plication have been sufficient to maintain her patellae centered within the patient-specific trochlear implants (Figures 6,7). She flexes easily to at least 120 degrees. The patient considers the procedure a success.

We thank Ronald P. Grelsamer M.D. (New York, NY) for contributing this case report.

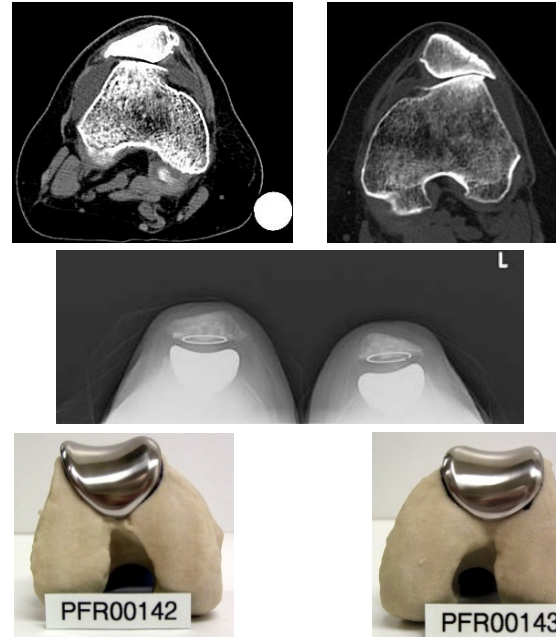


Figure 6. A 56 year old female with bilateral isolated end-stage patellofemoral arthritis, with bilateral trochlear dysplasia (top row), treated with patient-specific patellofemoral prostheses. Post-operative Merchant views (middle row) demonstrate proper orientation of patellofemoral implant components. Placement, fit, and alignment of both patient-specific trochlear implants were confirmed by the manufacturer using the patient-specific CT bone models prior to final polishing (bottom row).

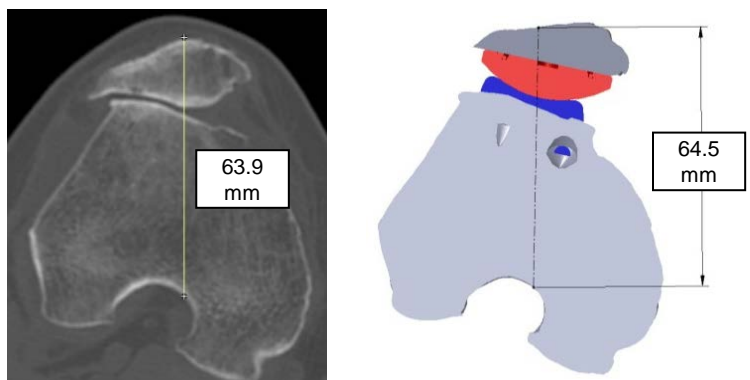


Figure 7. Comparison of (left) pre-operative and (right) post-operative anterior-posterior patellar offset for the right knee described in Figure 6. Post-operative measurements were based on the known geometry of the patient-matched patellofemoral implant and the all-polyethylene patella selected at the time of surgery. In the presence of pronounced trochlear dysplasia, treatment with a patient-specific patellofemoral arthroplasty prosthesis resulted in an insignificant net change in patellar offset (0.6 mm).