

#2000 - Clinical Study / Free Papers

Medium-Term Outcomes Of Imageless Robotic-Assisted Patello-Femoral Arthroplasty

Orthopaedics / Knee & Lower Leg / Joint Replacement - Primary

Giacomo Pacchiarotti¹, Alessandro Todesca², Michele Coppola²

1. Department of Orthopaedics and Traumatology, University of Rome “La Sapienza”, Rome, Italy
2. Department of Orthopaedic Surgery, Istituto Chirurgico Ortopedico Traumatologico (ICOT), Latina, Italy

Keywords: Patello-Femoral Arthroplasty, Robotic-Assisted Arthroplasty, Patello-Femoral Osteoarthritis

Background

Despite the precision-enhancing benefits of robotic-assisted surgery in implant positioning, its application in patello-femoral arthroplasty (PFA) remains barely reported in literature. The study is the first to introduce a series with a minimum three-year follow-up of PFAs implanted through a robot-assisted approach.

Objectives

The primary objective of this analysis is to assess the functionality of the implanted PFAs with multiple scores and their survival, offering valuable insights into the performance and longevity in the medium term.

Study Design & Methods

In a retrospective analysis, 16 patients, comprising 9 males and 7 females, with two individuals undergoing bilateral procedures, underwent NAVIO™ (Smith & Nephew Inc., Memphis, TN, USA) imageless robotic-assisted PFA surgery spanning from 2018 to 2021. The study targeted individuals experiencing anterior knee pain with isolated patello-femoral osteoarthritis, a minimum 3-year follow-up and the availability of all perioperative data. Rigorous evaluations were conducted, collecting pre- and post-operative data, including range of motion, radiographic images, and multiple scores: VAS, APKS, OKS, KOOS, and UCLA.

Results

The average age of the cohort at the time of surgery was 55.4±14.4 years (range: 32-78 years), while the average BMI (Body Mass Index) of the participants was recorded as 26.8±5.2 (range: 20-36). Etiologies for patello-femoral osteoarthritis included idiopathic degeneration in 44%, post-traumatic causes in 33%, and dysplasia in 22% of cases. Pre-implantation results were documented with scores of: VAS 7.9±1.4 (range: 4.9-10), AKPS 34.6±23.3 (range: 7-89), OKS 17.3±10.3 (range: 10-41). At an average follow-up of 54.6 months ± 9.1 (range: 36-67), overall patient satisfaction was high, with only two exceptions: One case experienced osteoarthritis progression, requiring primary arthroplasty revision. Another patient, with high preoperative functional scores (UCLA 7), maintained comparable post-operative results, not reaching his expectation. Clinical and radiographic follow-up showed no signs of loosening or infection. The mean maximum flexion reached an average of 131.1°±10.5° (range: 110°-145°), accompanied by significantly improved score results (p <0.01): VAS 1.10±1.4 (range: 0-4), AKPS 90.2±8.6 (range: 73-98), OKS 46.3±1.8 (range: 43-48), KOOS 155.3±7.5 (range: 146-167), and finally UCLA 5.3±1.5 (range: 3-7).

Conclusions

This study is the first to present a series of robotic assisted patello-femoral arthroplasty cases with a three-year minimum follow-up. The examination of medium-term functional and pain control outcomes post robot-assisted procedures, utilizing multiple scoring systems, shows high overall satisfaction, significant score improvements across the cohort, and excellent implant survival. The sole reported failure is attributed to tibio-femoral osteoarthritis progression.