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The Journey patellofemoral joint arthroplasty: A minimum 5 year follow-up study

Nathanael Ahearn *[,1], Andrew J. Metcalfe [1], Mohammed A. Hassaballa [1], Andrew J. Porteous [1], James R. Robinson [1], James R. Murray [1], John H. Newman [1]

Avon Orthopaedic Centre, Southmead Hospital, Bristol BS10 5NB, UK

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ABSTRACT

Background: The Journey patellofemoral joint arthroplasty (PFA) was designed to improve patient outcomes following surgical management of patellofemoral joint osteoarthritis. It is based on the asymmetric trochlear geometry of the Genesis II total knee arthroplasty, with Oxinium components, to provide a reliable treatment option in an often young, high demand group of patients.
Methods: We report the minimum five year functional outcome and survivorship of the Journey PFA performed at our institution between October 2005 and September 2009.
Results: A total of 101 Journey PFAs were implanted in 83 patients, and we have complete outcomes for 90 implants (89%). There were 80 implants in female patients, and the mean age at time of surgery was 60 years (26 to 86). The median Oxford Knee Score (0 to 48) improved from 18 to 30, and median Western Ontario and McMaster University Osteoarthritis Short Form Index (0 to 60) improved from 22 to 35. There were a total of 12 revisions, with mean time to revision 50 months (10 to 99).
Conclusions: The Journey PFA gives a good medium-term functional outcome with 88% survivorship at a mean of seven years. This is the largest study of Journey PFA in the literature, and it provides a reliable option for patients with isolated patellofemoral joint osteoarthritis when arthroplasty is considered.

1. Introduction

Isolated patellofemoral joint (PFJ) involvement occurs in around 10% of patients with symptomatic knee osteoarthritis [1]. There is often a predisposing risk factor, such as chronic patellar instability or trochlear dysplasia, and this can pose a challenge for optimal management. Isolated patellofemoral joint arthroplasty (PFA) has been a successful intervention for the management of isolated PFJ arthritis, with clinical outcomes comparable to total knee arthroplasty (TKA) [2]. As isolated PFJ arthritis often occurs in younger active patients, with normal tibiofemoral articulations, PFA may be a preferable option for this patient group. The literature reports a variety of implants showing good early to long-term clinical outcomes and survivorship [3–6].

Patellar stability with the PFA in situ is thought to be the key determinant of outcome. This relies on the inherent ability of the implant design to restore the complex anatomy and kinematics of the PFJ [5]. Stability can be increased by correction of abnormal patellar indices such as patella alta (by tibial tubercle distalisation) or trochlear dysplasia (by appropriately positioning the trochlear component, avoiding excess extension or anteriorisation).

The Journey PFA (Smith and Nephew, Memphis, Tennessee) was designed to address the failures of previous PFA designs, which were known to have high early failure rates due to patellofemoral dysfunction [7,8]. The trochlear geometry is asymmetric, based upon the design of the Genesis II TKA (Smith and Nephew, Memphis, Tennessee), implanted in neutral rotation with a lateralised trochlear groove in extension. The design of the trochlear component is critical in PFA implants as over 75% of patients have pre-existing trochlear dysplasia and patellar maltracking [9]. It is designed to articulate with the patella in extension, whilst being relatively unconstrained, and the coronal radius of curvature is deeper than that of previous unconstrained devices, attempting to optimise patellar function [10]. The femoral component is made of Oxinium with the aim of reducing wear rates on account of reduced scratch profile and increased wettability (Figures 1–3).

Whilst the Journey PFA has design features that could potentially result in improved patient outcomes compared to earlier implants, this has not been evaluated in clinical practise. There have been short term evaluations of the Journey PFA reported in the literature [5], reporting satisfactory outcomes. We report the minimum five

* Corresponding author at: 24 Withey Close West, Bristol BS9 3SX, UK. Tel.: +44 117 968 6207.
E-mail address: nahearn@nhs.net (N. Ahearn).
[1] Tel.: +44 117,950 5050.

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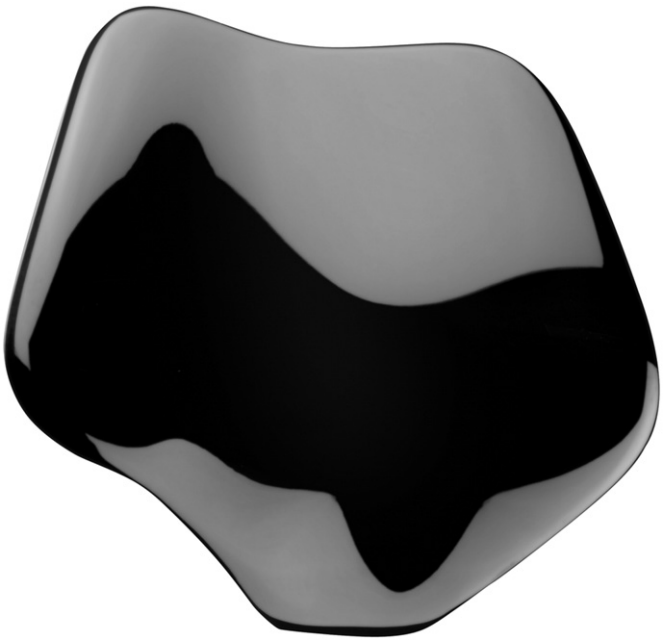

Figure 1. Journey PFA front view.

year functional outcome and survivorship of the Journey PFA at our institution.

2. Methods and materials

A retrospective review of prospectively collected data was undertaken of a consecutive series of adult patients who underwent PFA using

Figure 2. Journey PFA side view.

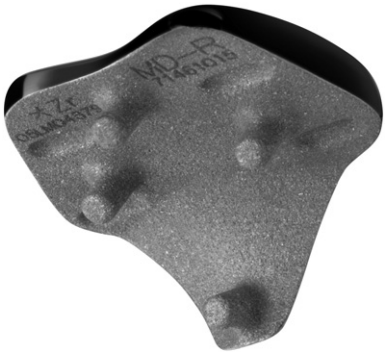

Figure 3. Journey PFA back view.

the Journey implant. The operations were performed between October 2005 and September 2009. The patients were identified from the Bristol Knee Group database, which was used to record all cases performed at the Avon Orthopaedic Centre, Southmead Hospital, Bristol (North Bristol NHS Trust), the Spire Bristol Hospital, and the Nuffield Health Bristol Hospital.

The indications for surgery with the Journey implant were any adult patient undergoing primary PFA for symptomatic PFJ arthritis, with intact cruciate ligaments (Figures 4–6). We included patients that had previously undergone re-alignment surgery, such as tibial tubercle osteotomy, and those with a fixed flexion deformity up to 10°. Exclusions were patients with significant tibiofemoral osteoarthritis, or inflammatory arthritis.

All patients underwent pre-operative patient reported outcome measures. These included Oxford Knee Score (OKS), Western Ontario and McMaster University Osteoarthritis Short Form Index (WOMAC), American Knee Society Score (AKSS), Fulkerson patellar instability score and Short Form-12 Health Survey (SF-12). Clinical follow-up was performed at two and five years and outcome measures were collected. Patients in this study were posted a further questionnaire at a minimum five years post-operatively (unless one had been completed within the past year) containing the above patient reported outcome measures, a question about further operations and revision, and a visual analogue scale (VAS) for satisfaction. If this failed to yield a response, a repeat questionnaire was sent, followed by a telephone interview where possible.

The primary outcome measure was the patient reported outcome measure score at five year follow-up (OKS, WOMAC, and AKSS). Secondary outcome measures included implant survivorship. In addition complications, time to revision, and an outcome of patient satisfaction were recorded.

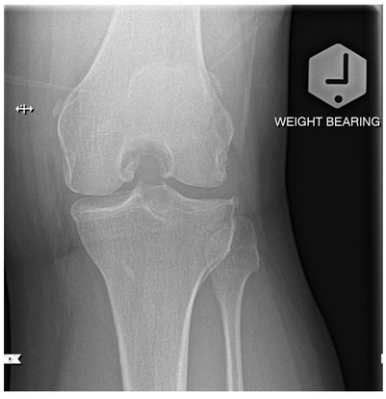

Figure 4. Preoperative Rosenberg radiograph demonstrating absence of tibiofemoral osteoarthritis.