

Outcomes and Complications of Unicondylar Arthroplasty

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KEYWORDS

- Unicompartmental knee arthroplasty • Patellofemoral compartment
- Lateral compartment • Medial compartment

KEY POINTS

- With careful attention to specific patient and anatomic indications, unicompartmental knee arthroplasty offers clinical results and survivability that are as good, or better, than total knee arthroplasty.
- Unicompartmental knee arthroplasty results in diminished perioperative morbidity compared with total knee arthroplasty.
- Unicompartmental knee arthroplasty can be converted to total knee arthroplasty with relative technical ease.
- Although not performed as frequently as medial unicompartmental knee arthroplasty, with a few specific technical alterations lateral unicompartmental knee offers a reliable option for management of isolated lateral compartmental arthritis.
- Unicompartmental knee arthroplasty is an alternative to total knee arthroplasty in appropriate selected patients and is not a “bridge” procedure.

INTRODUCTION

Unicompartmental knee arthroplasty (UKA) was initially introduced in the early 1960s as an alternative to total knee arthroplasty (TKA) for arthrosis limited to either the medial or lateral tibiofemoral compartment. Proponents of UKA cited its ease of implantation, minimal bone sacrifice, more natural-feeling knee, more normal gait, and ease of revision to TKA as rationale for selecting UKA over TKA. Nevertheless, a combination of poor prosthetic design and instrumentation and poor patient selection led to high rates of failure in early series.^{1–6} As a result of high rates of failure, UKA was widely abandoned by the late 1980s. In the last 15 years, UKA has seen resurgence

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as several studies have demonstrated that survivorship of UKA is comparable or superior with that of TKA in appropriately selected patients.

HISTORIC DURABILITY AND SURVIVORSHIP OF DESIGN

Modern UKA first developed in the 1960s with tibial hemiarthroplasty implants. Introduced in 1964, the MacIntosh prosthesis consisted of a single piece of cobalt-chrome that had a smooth concave superior surface and a flat serrated inferior surface. The McKeever prosthesis, developed around the same time, was a similar tibial metal-resurfacing prosthesis that included a T-shaped fin on the undersurface for additional fixation. Short and intermediate follow-up studies demonstrated good results in 70% to 80% of patients undergoing hemiarthroplasty.¹⁻³ More recently, Springer and colleagues⁴ demonstrated a 50% revision rate of 26 knees treated with the McKeever prosthesis at average 8 years, with all being easily converted to either UKA or TKA. Remaining patients had good function at long-term follow-up (mean, 16.7 years). The McKeever tibial hemiarthroplasty was concluded to be a reasonable surgical option in patients who are not candidates for osteotomy or UKA.

In the late 1960s, UKA progressed to prostheses that resurfaced both the tibial and femoral surfaces, with the introduction of such implants as the polycentric knee, the St. Georg sled, and the Marmor. These prostheses were used in either a unicompartmental or bicompartamental manner depending on the extent of arthritic involvement. Initial reports were concerning because of high rates of early failure. Laskin⁶ reported minimum 2-year follow-up data on 37 patients treated with the Marmor UKA. In the follow-up interval, eight patients (22%) required revision surgery and more than half of patients in the series experienced settling of the tibial component greater than 1 mm. Revisions were performed for progression of arthritis in the other tibiofemoral compartment (four patients); patellofemoral pain (two patients); severe unexplained knee pain (one patient); and loosening of the tibial components (one patient). Insall and Aglietti⁵ reported 5- to 7-year follow-up results of 32 patients undergoing hemiarthroplasty in the early 1970s. Of 22 patients available for follow-up, 7 required revision surgery (32%) and only 8 experienced a good result.

By the end of the 1980s, more encouraging reports began to appear in the literature demonstrating results of UKA that were comparable with TKA and better than osteotomy in the appropriate patient population. Thornhill⁷ reported excellent results in 92% of patients at 42-month follow-up. Capra and Fehring reviewed results from 52 patients undergoing UKA at 8.3-year follow-up and predicted survivorship of 93.75% at 10-years postarthroplasty, comparable with contemporary reports of TKA survivorship.⁸ Kozinn and colleagues⁹ reported good or excellent results in 92% of knees at a mean 5.5-year follow-up after UKA with a metal-backed tibial component. Ninety-two percent of the knees were rated as having a good or excellent result, and 94% had lasting relief of pain. There were no failures requiring revision. Heck and colleagues¹⁰ demonstrated a 10-year survivorship rate of 91.4% in 294 patients undergoing UKA with the Marmor prosthesis at multiple centers. These promising reports were all tempered by caveats stressing proper patient selection with regard to patient-specific and anatomic factors.

MODERN UNICOMPARTMENTAL INDICATIONS

In light of increased emphasis on patient selection, Kozinn and Scott¹¹ outlined specific indications for UKA in 1989 with regard to patient age, weight, activity level, pain, range of motion, and angular deformity. In terms of patient-specific factors, they recommended that patients be more than 60 years old; have low demand for activity

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