***CORR* Insights®: The Oxford Unicompartmental Knee Fails at a High Rate in a High-volume Knee Practice**

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Where Are We Now?

The survivorship of medial unicompartmental knee replacements observed in national joint registries is uniformly worse than that reported by individual centers, particularly those institutions where an implant system was developed [16, 17, 20, 22, 26]. The registries also show that community unicompartmental knee replacement failure rates are roughly twice that of total knee replacements [9, 15]. In the specific case of the Oxford unicompartmental knee replacements (Oxford, Biomet, IN, USA), the revision rate in registries is four times that reported by developers [17]. Suggested explanations for the discrepancy include inappropriate surgical technique, and patient selection

reflecting surgeon inexperience. Critics of registry data also point out that the indication in a large proportion of unicompartmental knee replacement revisions is nonspecific pain rather than poor function, implant loosening, or that radiographic signs of loosening are perhaps overinterpreted [1, 10, 12]. As the volume of total knee replacement has surged, unicompartmental knee replacements have held their ground — at about 8% to 10 % of cases worldwide — because some surgeons believe they offer a cost-effective, less invasive, and more functional alternative to total knee replacement. According to recent papers [2, 3, 14, 19], including some from the Oxford developers, indications for unicompartmental knee replacements may be too restrictive. On the other hand, Kaiser Permanente National Registry data [20, 21] showing relatively high unicompartmental knee replacements failure rates persuaded participating surgeons to use fewer partial knee replacements. The New Zealand National Joint Registry [22] concluded that the poor results of unicompartmental knee replacements revisions “contraindicate” the use of unicompartmental knee replacements in younger patients. The cost and morbidity of unicompartmental knee replacement revision now drive such decisions [6, 7, 15, 18].

This CORR Insights® is a commentary on the article “The Oxford Unicompartmental Knee Fails at a High Rate in a High-volume Knee Practice” by Schroer and colleagues available at: DOI: 10.1007/s11999-013-3174-5.

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Where Do We Need to Go?

In a report of 83 cases, Schroer and colleagues addressed some of the uncertainties associated with registry data. Apparent radiographic implant loosening was confirmed by bone scan and intraoperative assessment. No knee was revised for pain or radiographic loosening alone. The surgeon used the indications, instrumentation, and techniques advocated by the implant developers, and he cannot be dismissed as “low volume.” Nonetheless, 11 implants had

loosened by 5 years and nine of these implants were revised. Two other knees underwent revision; one for polyethylene dislocation and another for lateral compartment degeneration. The study authors did not observe a “learning curve” effect, tending to confirm that inexperience was not at the root of these failures. The series is small, but the number of failures was large enough to convince the surgeon to stop using this unicompartmental knee replacement. The authors did not offer a specific explanation for the implant loosening, but they speculated that the implant developers may have mastered a technique not readily transferable to smaller centers. Unfortunately, the study authors did not provide information on prosthesis or limb alignment. Immediate postoperative alignment is an objective way to observe how closely some operative criteria were met. Despite recent deemphasis of this principle [5, 13], it appears that limb alignment and implant position play an important role in unicompartmental knee replacement survival.

Where Do We Need to Go

The limitations of registry data are well known, but the discrepancy between unicompartmental knee replacement and total knee replacement revision rates is a fact. We thank Schroer and colleagues for taking the time to show that even qualified, high-volume, subspecialized community surgeons cannot match the outcomes reported by developers. If unicompartmental knee replacement is to maintain its place in the treatment of medial gonarthrosis, this problem must be addressed more effectively. One approach would be a retrospective, independent sample of failures reported to registries. Such a multicenter study in France [8] revealed that implant loosening and arthritis progression — not “pain” — accounted for a majority of revisions. If surgical technique is the issue, as the multicenter study suggested, we should identify all potentially critical errors, and determine whether these correlate with failure. The high incidence of radiolucencies around the Oxford unicompartmental knee replacement is alarming, and one wonders whether developers are unusually tolerant of loose implants. Roentgenographic stereophotogrammetric analysis can detect subtle, but continuous migration diagnostic of loosening in total knee replacement [11]. Roentgenographic stereophotogrammetric analysis has been used to evaluate unicompartmental knee replacement wear, and migration in eight asymptomatic knees, but not in a prospective evaluation of implant stability [4, 23–25]. A prospective Roentgenographic stereophotogrammetric analysis study at a high-volume independent institution may be the fastest way to quantify loosening rates in unicompartmental knee replacement; this would help us

determine whether technique is responsible for most failures. Unicompartmental knee replacement may be a tricky procedure, but an experienced arthroplasty surgeon can master the approach. The precise surgical objectives and indications for medial unicompartmental knee replacement are not well established, which is a far greater concern.

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