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The incidence and impact of arthroscopy in the year prior to total knee arthroplasty

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ABSTRACT

Background: Prior knee surgery an arthroscopy is known to increase complications and re-operations in subsequent total knee arthroplasty (TKA). We set out to examine the time dependant effect of arthroscopy on Patient Reported Outcome Measures following subsequent TKA.
Methods: A retrospective review of theatre and clinical records identified 186 patients who underwent TKA within a year of arthroscopy (2009–2013). Oxford knee score (OKS) data was compared with a published cohort from the same department (1708 patients).
Results: One hundred and eighty six patients were identified who underwent TKA within a year of arthroscopy; 112 females, 74 males; mean age 64 (SD 10); mean BMI 31.4 (SD 4.6). There was no significant difference between groups with respect to sex, age, BMI, or pre-operative OKS.
One hundred and three patients underwent TKA within six months of arthroscopy. This group had a significant reduction in OKS compared to the previously published cohort (32.8 vs 35.3, $p < 0.005$). There was no significant difference in OKS when TKA was performed more than six months after arthroscopy (35.3).
The re-operation rate was 14% in the arthroscopy group, with a revision rate of 3.8% vs 1.6% in a previously published large cohort from the same institution.
Conclusions: There appears to be a negative impact of arthroscopy in relation to subsequent TKA which seems to be time dependent. TKA should not routinely be performed within six months of arthroscopy. This should inform guidelines on the management knee osteoarthritis.

1. Introduction

The role of knee arthroscopy in the management of the degenerate knee remains a contentious issue. It is well established that arthroscopic debridement or lavage is no better than sham surgery or physiotherapy for patients with osteoarthritis (OA) [1,2]. A recent meta-analysis has demonstrated that even in the presence of mechanical meniscal symptoms, any short term benefits provided by arthroscopy do not persist at one year [3]. This research conflicts with the literature demonstrating the ability of arthroscopy to delay total knee arthroplasty (TKA) [4,5], which suggests that its benefits may not be quantifiable by current metrics.

Over recent years there has been a growing body of literature examining the impact of prior knee arthroscopy on subsequent TKA. Early studies examining the risk of prior arthroscopy reported contrasting outcomes; increased postoperative complication and revision rates in one study; and no demonstrable difference in implant survival, Knee Society scores or radiographic outcomes in another [6,7]. A more recent study, based on the interrogation of a national database, demonstrated an increased rate of infection, stiffness and venous

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thromboembolism (VTE) when TKA was performed within six months of arthroscopy [8]. This was the first study to identify the time critical nature of arthroscopy's negative impact on outcomes following subsequent TKA.

The current evidence base has been underpowered to determine if there is any impact on Patient Reported Outcome Measures (PROMs) based on the timing of arthroscopy prior to TKA [8]. The primary purpose of this study was to examine the time dependant effect of arthroscopy on a Patient Reported Outcome Measure (PROM) following subsequent TKA. By identifying all patients who had undergone TKA within a year of arthroscopy at a large arthroplasty unit from 2009 to 2013, we were able to compare PROMs data against a recently published cohort from the same unit [9].

2. Patient and methods

Between January 1st 2009 and 31st December 2013 we collected data on all patients who underwent a primary TKA at a large teaching hospital. Appropriate local review board approval for the research has been obtained. Data was collected prospectively but reviewed retrospectively. Our inclusion criteria were all patients having a primary TKA for OA who had undergone knee arthroscopy within 12 months of their TKA. This initially gave a study group of 203 patients. The number excluded was 17. Eight underwent TKA more than a year post-arthroscopy. One patient had a unicompartmental arthroplasty. One patient died and seven had no follow-up data. This gave a final cohort of 186 patients.

We collected demographic information pre-operatively, which included patient's age, gender, body mass index (BMI) and Oxford Knee Score (OKS). We recorded the findings at arthroscopy, including the Outerbridge grade for OA and any procedures performed. For this study the highest arthroscopic grade found in each compartment was used to represent the overall severity of osteoarthritis in that compartment as has been previously described [10]. Post-arthroscopy care was recorded, including any subsequent physiotherapy, intra-articular injections or oral analgesia prescription. Patients' self-rated satisfaction with arthroscopy was determined from the clinic letter and recorded as: symptoms improved, unchanged or deteriorated. All TKA procedures were performed by either a consultant, a middle grade surgeon with at least five-year experience or a specialist registrar directly supervised by a scrubbed consultant. The implant used in all cases was the Zimmer NexGen prosthesis (Zimmer, Warsaw, USA), via a medial parapatellar approach, with or without patellar resurfacing. All patients followed the same pre- and post-operative care pathway. Antibacterial prophylaxis using one pre-operative dose and two post-operative doses of a second generation cephalosporin was standard. Antithrombotic prophylaxis involved the use of mechanical calf compression devices until discharge and chemo-prophylaxis for 14 days postoperatively with either Enoxaparin (Sanofi, UK) or Rivaroxaban (Bayer, UK).

A standardised physiotherapy regime was started on the same day or the following post-operative day and included full weight bearing. Patients had to satisfy an objective set of criteria before discharge; to be independently mobile, safe on crutches or an appropriate aid and to be safe on stairs. Patients were evaluated at three and 12 months post-operatively in a specialist nurse clinic, and for the purpose of this study, contacted by telephone for an up to date OKS. A final notes review was performed in June 2015 to assess for documented complications and re-operations.

Statistical comparison was made between the study cohort and a recently published series of 1708 TKA performed in the same unit [9]. Statistical analysis was performed using StatsDirect (StatsDirect Ltd., UK) and the integrated statistical tools of Microsoft Excel (Microsoft Office 2016, © Microsoft Corporation, USA). The unpaired t-test was used for continuous data and the chi-squared test for non-continuous data. A p value of 0.05 was accepted as being statistically significant. The OKS data was distributed as one would expect; a bell curve shifted to the left in the pre-op data and to the right for the post-op. Given our sample size the use of a parametric test was valid [11].

Although not possible to compare with the previously published cohort an analysis was undertaken to ascertain whether there were any likely confounding features that might predispose to a poor outcome following TKA in the study group.

3. Results

Between January 1st 2009 and 31st December 2013 there were 3568 knee arthroscopies and 1784 primary TKA performed in our unit. Of the 3568 arthroscopies performed, 505 (14.2%) were in patients over 65 years old. Of the 1784 primary TKA performed in our unit, 186 (10.4%) had undergone arthroscopy in the preceding year. The demographic characteristics of the

Table 1
Comparison of patients who had undergone arthroscopy in the year prior to TKA against a published cohort of 1708 TKA from our department..

	Previously published LTHTR cohort	All TKA post-arthroscopy	TKA within <6/12 of scope	TKA >6/12 of scope
Number TKA	1708	186	103	83
Mean age (SD)	68 (10)	65 (8.5)	66 (8)	63 (10)
Mean BMI (SD)	30.3 (6.3)	31.4 (4.6)	31.3 (4.8)	31.4 (4.6)
% Female	57%	60%	60%	60%
Cemented	63%	83%	78%	89%
Un-cemented	32%	11%	17%	4%
Hybrid	5%	6%	5%	7%
Mean (SD) length Follow-up (months)	20 (17.0)	40.9 (16.4)	45.5 (16.2)	35.3 (14.8)
Mean (SD) pre-op OKS	15 (6.5)	14.9 (6.3)	14.8 (6.4)	15.2 (6.2)
Mean (SD) post-op OKS	36.3 (9.2)	33.8 (11.1)*	32.8 (11.3)*	35.3 (9.9)

* $p < 0.005$.

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