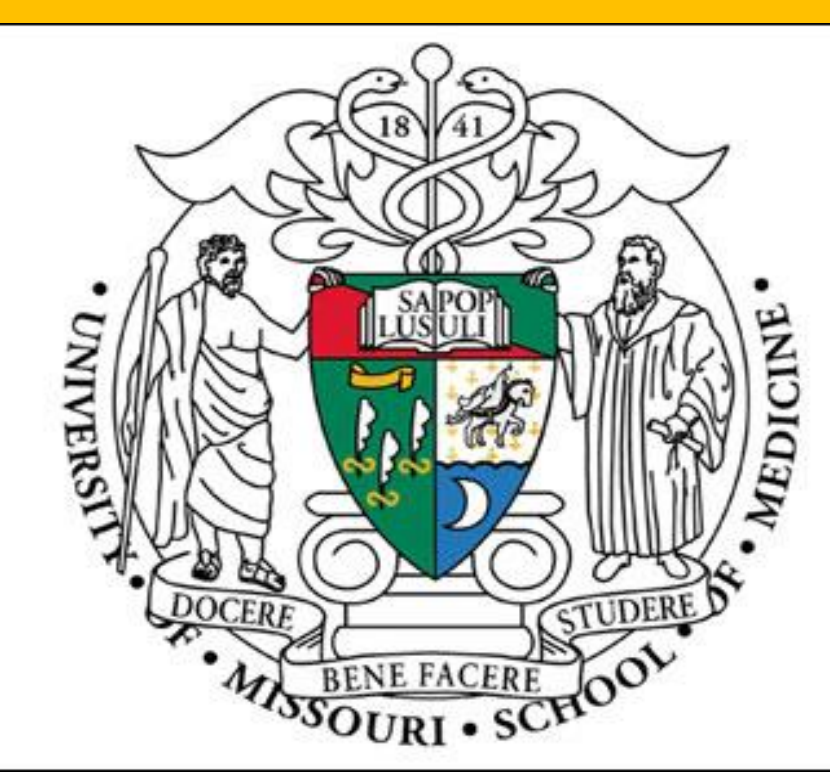




Final surgical interventions in primary total knee arthroplasty infections: a retrospective cohort

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Introduction

Periprosthetic joint infection (PJI) is a devastating complication of total knee arthroplasty (TKA). Incidence of PJI in TKA ranges from 1-2%¹⁻². In the United States, two stage revision has become the gold standard for treatment of chronic PJI³. The two-stage revision was first advocated by Insall⁴ and has been tailored to incorporate explanation, placement of antibiotic spacer with parental antibiotics, and reimplantation when lab values or cultures have normalized. Acute infections and hematogenous infections treated early may respond with irrigation and debridement with or without modular component exchange. There has been great discrepancy in the reported success rates of two stage revisions, with most studies reporting success rates over 90%⁴⁻⁶. We performed a retrospective analysis of surgical interventions for PJI in primary TKA treated at our institution with the aim of investigating the overall course of treatment, number of reoperations, and final outcomes of an intended two-stage intervention.

Methods

We obtained an IRB waiver to retrospectively collect data from our institution's electronic medical record. Billing records were used to identify those treated for PJI. Inclusion criteria consisted of patients who had undergone primary TKA for any indication. Outside referrals for PJI treatment were included if original components were retained and treatment was provided by one of three arthroplasty trained surgeons at our institution. We included cases that met the Musculoskeletal Infection Society criteria for PJI, however, this cohort underwent treatment before the publication of the 2011 guidelines. In some cases, complete documentation satisfying the multiple criteria was not well documented. We included patients based on the intention to treat for PJI per the surgeon's discretion. Patients were excluded if treatment intervention was not for PJI, documentation was inadequate, or if no follow up existed. Demographic data, dates of operations, types of intervention, and length of follow up were recorded. We aimed to collect data from a cohort with up to five years of follow up with dates ranging from January 2006 to December 2009. Treatment was categorized based on the patient's eventual or most invasive intervention. For example, patients treated with irrigation and debridement followed by two-stage revision were considered as part of the two-stage intervention group. Total number of operations were recorded as well as final surgical interventions.

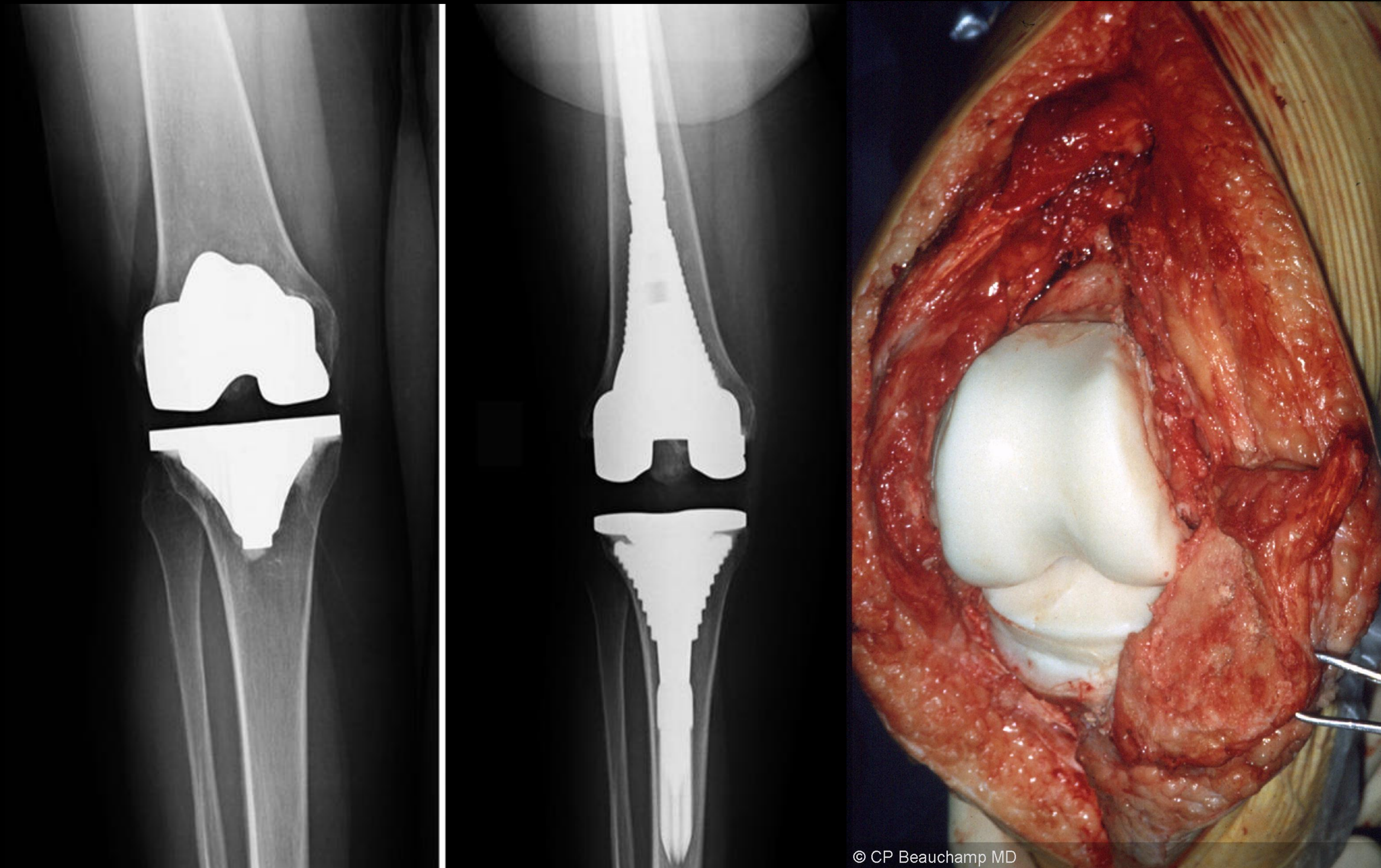


Figure 1
Left: An infected knee replacement (left) and the final reimplanted knee (right)
Right: An antibiotic cement spacer used in the intermediate stage of two stage revision

Table 1: Treatment type and outcomes of two stage joint revisions

	Mean/Incidence	SD/rate	Range
Age	61.4	+/- 8.59	41.8-76.6
Sex	7 Male		
Time from initial operation (mo)	17.3	+/- 19.4	0.2-69.7
Follow up duration from initial intervention (mo)	59.4	+/- 29.4	
Two-stage never reimplanted	4/18	(22.2%)	
<i>Antibiotic spacer</i>	2/4	(50%)	
<i>Amputation</i>	2/4	(50%)	
Two-stage reimplanted	14/18	(77.8%)	
<i>Have another operation</i>	9/14	(64.3%)	
<i>Total operations</i>	3.22		1-5
<i>Retain reimplanted components</i>	7/14	(50%)	
<i>Revision TKA after reimplanted</i>	2/14	(14.2%)	
<i>Fused after reimplanted</i>	2/14	(14.2%)	
<i>Amputation after reimplanted</i>	1/14	(7.1%)	
<i>Mortality</i>	1/14	(7.1%)	

Results

After obtaining IRB approval, we identified 140 patients who had undergone treatment for a chronic PJI with a two-stage revision by one of three fellowship trained arthroplasty surgeons. Patients were excluded for analysis if they had a minimum of 2 year follow up after the initiation of staged treatment. Average follow-up was 48 months (range <1-113 months). Eighty-two percent of patients who had undergone treatment of PJI did not return for follow-up at a minimum of 2 years after surgery. Only 25 patients (18%) had returned for clinical and radiographic follow-up (Table 1)

Conclusions

Two stage revision is largely regard as the gold standard for treatment of chronic PJI in primary TKA. Follow-up for these patients who continue to be at risk for infection related failure over an extended period of time frequently did not return to the institution where their infection management was started. Our retrospective study identified that a subset (23.8%) of those undergoing two-stage intervention and who had returned for follow-up were never reimplanted. Only half of those reimplanted retain those components over a 31 month follow up from the time of their initial intervention. These results give a more guarded prognosis for the outcome of patients with prosthetic joint replacement than what has been traditionally reported in the literature. The more challenging prognosis may be impacted by host comorbidities, antibiotic susceptibility of infecting organisms, timing to surgical treatment, or other factors.

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