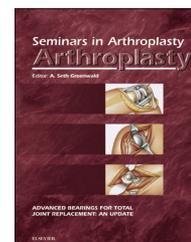


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The causes of total knee arthroplasty failure: Avoiding your next revision



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ABSTRACT

This article is a personal retrospective of the author's more than 35 years of experience as an arthroplasty surgeon and specifically addresses how to avoid revision total knee arthroplasty.

1. Avoid revision surgery if the patient is satisfied, unless imminent danger of prosthetic failure appears.
2. Use proper technique at the primary arthroplasty to avoid the problems of aseptic loosening, instability, malalignment, and infection that force most revisions. Scrupulous attention to detail in patient selection and operative technique at the primary surgery will help avert revision surgery.
3. Remember that surgical technique is prosthesis specific. Understanding the design and insertion philosophy of each implant is crucial to success; every implant system is different.
4. Strive to understand the underlying reason that an arthroplasty has failed to make a patient satisfied and fix the problem at revision. If the reason for revision is unclear, it is unlikely that surgery will make the patient better.
5. Avoid revision surgery if the problem is pain with no identifiable, surgically correctable problem.
6. Maintain strict selection criteria for obese patients, who have higher prevalence of problems that can lead to total knee revision. Surgeons who operate on obese patients likely will have more revision cases. Often, however, obese patients have gratifying results in terms of pain relief and improved function.

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1. Introduction

Orthopaedic companies and physician practices post successful total joint replacement patient testimonials, exceptional clinical outcomes, and high survivorship rates, all of

which have conditioned patients to expect near 100% success for every surgical intervention. The national projected usage of total knee arthroplasty, the tri-compartmental total knee, stands at nearly three quarters of a million for 2016. It has been suggested that only 80% of patients will rate their

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total knee arthroplasty as successful and this leaves a significant number of patients who may present seeking an improved result. Addressing the unhappy patients who are not satisfied with their results remains a challenge for the arthroplasty surgeon. While revision of the unsuccessful knee may be imperative in some cases, avoiding revision outside of a strict set of indications is key to true success.

2. The problem

Several scoring systems (the Knee Society Score, the Oxford Knee Score, WOMAC, etc.) are available to determine the result of total knee arthroplasty. However, if the patient is unhappy then, regardless of the clinical score, nobody is happy with the result. Patient satisfaction is based on pain relief, which is relatively easy to measure with a numeric score, and on function, which is hard to measure, is very subjective, and ultimately comes down to whether the patient is satisfied with the result. If the patient is satisfied, even with malposition, malalignment, or instability, revision should be avoided. The exception, of course, is infection or obvious polyethylene wear with danger of wear through, but polyethylene wear is less of a reason for a revision now than a decade ago. Because “the enemy of good is better,” revision should be avoided by only intervening when a clear clinical indication exists for intervention.

Patients generally are not dissatisfied from lack of arthritic pain relief, which in most practices is a problem in less than 10% of arthroplasties, but rather from their perceived inability of the patients to do what they want to do. Patients expect to return to full and pain-free function of everything they want to do, and patients whose expectations are not met will seek revision. In a study reported in 2014, only 66% of people reported that their knee was “normal,” and between 33% and 54% had some residual arthritic symptoms and functional problems [1]. The Table lists published studies since 1982 with the most common reasons for revision knee arthroplasty [2–9].

3. Infection

Patients with infection exhibit a clear indication for treatment with revision arthroplasty. The International Consensus Meeting on management of prosthetic joint infection, directed by Javad Parvizi and Thorsten Gehrke [10], surveyed a large group of international orthopaedic surgeons to outline clinical protocols to prevent infection—from patient preparation, surgeon preparation, skin preparation, and wound handling during and after surgery—or treat infection. The recommendations include weight loss management, smoking cessation, nutritional counseling, diabetic control, remote source infection control, MRSA screening, chlorhexidine wash, temperature control, Foley catheter removal, etc. The most important conclusion from the Consensus Committee was for surgeons to measure and report surgical site infections (SSI). They concluded that if SSI are not tracked, hospitals and surgeons are not really serious about decreasing this reason for revision [10].

4. Other reasons for revision

Other reasons for revision—instability, loosening, malalignment, and malposition—are for problems related to total knee arthroplasty design and surgical technique. For most orthopaedic surgeons, implant design is out of their hands. Engineers and surgeon designers collaborate ideas with historical perspective and use of best judgment, testing in the laboratory and then clinically to optimize design characteristics and an insertion technique. Ultimately, it is the surgeon who chooses the system to use. Many choices include cruciate retaining, bicruciate retaining, cruciate substituting; medial ball-and-socket (my favorite), mobile bearing, or rotating platform, etc. Literature abounds in support of each design, with no shortage of key opinion leader exhortation for each specific prosthesis. Surgeons also must choose from technique dogmas: externally rotate or do not externally rotate; 5°, 3°, or 7° of distal femoral valgus resection; medial collateral ligament release or gap balance, intramedullary or

Table – Reasons for Total Knee Arthroplasty Revision (%)

Study	Cameron and Hunter [2]	Rand and Bryan [3]	Fehring et al. [4]	Sharkey et al. [5]	Bozic et al. [6]	AOA [7]	Schroer et al. [8]	Thiele et al. [9]
No. of patients	94	142	279	212	60,355	9880	844	358
Polyethylene wear	6.4		7	25	4.9	1.4	10	7
Aseptic loosening	41.5	20.4	3	24	16.1	30	31.2	21.8
Instability	2.1	38.7	27	21	25.2	5.8	18.7	21.8
Infection	20.2	0.7	38	17.4		21.7	16.2	14.5
Arthrofibrosis				14.6		3.8	6.9	4.5
Malalignment/ malposition	3.2	28		11.8		2.2	6.6	20.7
Extensor mech failure AVN patella		0.7		6.6				0.6
Periprosthetic fracture	2.1	3.5		4.2				
Isolated patellar revision				2.8	1.5	2.4		3.3
Other	24.5		18	0.9		2		5.9
				0	35.4	30.7	10.4	

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