

Minimally Invasive and Small Incision Joint Replacement Surgery: What Patients Should Consider

Purpose

The purpose of this position statement is to provide information to patients about the emerging use of minimally invasive and small incision techniques in the practice of hip and knee joint replacement surgery.

Background

Hip and knee replacement are among the most common and successful orthopaedic surgeries. The indications for these surgeries are well established and their overall success documented by extensive research^(1,2). Substantial pain relief and improvement in function, with longevity of 15 years or more, is expected for most patients.

Minimally invasive and small incision joint replacement surgery has recently been offered by some surgeons, and has been promoted by surgeons, hospitals, and orthopaedic industry. This variation of traditional joint replacement surgery encompasses an array of modifications to the original technique.

Definitions

“Less invasive surgery” is terminology that encompasses both small incision techniques and minimally invasive techniques. Small incision hip and knee replacement surgery entails performing the conventional approach through a smaller skin incision. The length of less invasive incisions may be compared to contemporary incisions (those used by most surgeons today), which are smaller than historical incisions (those used when joint replacement surgery was in its early stages of development). Minimally invasive hip and knee replacement surgery uses not only a smaller incision (or incisions) but also new exposure techniques. This is said to be less invasive to soft tissues and or bone.

In knee arthroplasty published studies have defined incisions for less invasive surgery as approximately one-half that of contemporary incisions. Some techniques allow a minimally invasive approach to the knee to minimize incisions into the extensor mechanism or the suprapatellar pouch.

In less invasive hip arthroplasty, reports have described both one and two incision surgeries. Some techniques allow for surgery through a single incision, usually one-half the length of a contemporary total hip incision. Other techniques utilize 2 smaller incisions – each 2 to 4 inches in length. Minimally invasive surgery may allow less hip muscle detachment and smaller capsular incisions.

Less invasive surgery may include unique pre- and post-operative pathways for anesthesia, nursing care and rehabilitation. Some institutions, however, may include both contemporary and less invasive surgical patients in the same pathways.

Patient Selection Criteria

Patient selection for less invasive surgery is evolving, but some surgeons define the ideal patient as young, thin, healthy, and motivated. Good candidates should have a thorough understanding of the possible advantages and disadvantages of this type of surgery.

Possible advantages

The reported advantages of less invasive surgery occur in the first few weeks or months after surgery. The reported short-term advantages include:

- Smaller incision length (improved cosmesis)
- Less discomfort (immediate peri-operative pain)
- Less blood loss (fewer blood transfusions)
- Shorter hospitalization
- Shorter rehabilitation
- Earlier return to work

Possible disadvantages

The reported disadvantages of less invasive surgery relate to the difficulty of performing surgery within a restricted visual field as well as issues related to learning a new exposure technique. The reported disadvantages include:

- Stretching/tearing of skin/soft tissues
- A more restricted visual surgical field
- Increased duration of surgery
- Superficial nerve injury in hip surgery with the anterior incision
- Fracture of bone during implant insertion
- Limited implant choices

Unknown surgical technique related factors

Several factors are not yet thoroughly understood when comparing contemporary and less invasive hip and knee replacement surgery. These factors will be the object of ongoing research, and include:

- Long-term durability of the joint reconstruction
- Long term pain relief, motion and function
- Implant positioning
- Infection rate
- Incidence of thromboembolism
- Incidence of neurovascular injury
- Joint stability and dislocation rate
- Reoperation rate

What to discuss with your surgeon

You should have a clear understanding of the goals of your joint replacement surgery before you proceed. A discussion of joint replacement surgery should include a review of the technique that your surgeon suggests. If your surgeon offers minimally invasive or small incision surgery, ask about potential short-and long-term risks and benefits of this type of surgery. Review his or her specific results for contemporary and minimally invasive surgery in relation to fracture, infection, blood clot, neurovascular injury and dislocation rates. Inquire about his or her qualifications, competence, and proficiency with the technique. Understanding the usual post-operative course, including hospitalization, blood loss, rehabilitation, and return to work is important.

Conclusion

Less invasive hip and knee replacement surgery is of great interest to both patients and their surgeons. Much of this interest is based on the promise of the same or better long-term results, with a shorter and less painful recovery. This set of outcomes has not yet been validated with large studies. The most positive results have been demonstrated by a small number of high surgical volume total joint centers in selected patient populations. We will have a better understanding of the value of this type of surgery in the future, and hope to understand whether it will benefit most joint replacement patients, just select groups of patients, or relatively few patients.

Credentialing

The AAHKS, through its educational endeavors, attempts to educate the public, orthopaedic surgeons, and other practitioners about new and existing techniques. However, the AAHKS does not certify the competence of an individual for clinical use of a new technique or provide any credentials.

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References

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2. NIH Consensus Development Conference on Total Knee Replacement, December 8-10, 2003, Final Statement
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