

Advances in Hip Surgery

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Over the past several years there have been several advances in the field of hip surgery. Some advances have resulted in less invasive surgery enabling more rapid recovery, other advances have resulted in more durable implant options that may permit a higher level of patient function or greater implant longevity.

Amongst some the more notable advances are hip arthroscopy, hip resurfacing arthroplasty, anterior surgical approach to the hip and alternative bearings.

Hip Arthroscopy

Although arthroscopy of other joints, particularly the knee, has been available for many years, arthroscopy of the hip has only recently become commonplace. The development of a traction table and specialized equipment has permitted a wide range of surgical options that in the past were very difficult if not possible to perform. The specialized traction table is the

same table that is used in the anterior approach to the hip.

The understanding of a condition known as femoro-acetabular impingement as a cause of hip pain has resulted in diagnosis and treatment of patients with hip pain. Femoro-acetabular impingement is when the neck of the hip contacts the front of the hip socket when the hip is flexed. This can be as a result of abnormal anatomy of the neck or less commonly the socket. It can also be seen in people with extremely mobile hips such as gymnasts and other flexible athletes. This impingement can damage the labrum (a ring of tissue encircling the socket) and the articular cartilage. This can result in pain, a catching sensation in the hip and subsequent osteoarthritis of the joint.

Arthroscopy of the hip is an outpatient procedure done through two or three puncture wounds. The labrum can be shaved or repaired, the impinging bone can be resected, loose flaps of cartilage can be removed and the overall state of the joint can be assessed. Recovery is rapid and by one week most patients are walking well.

Treatment of hip impingement may prevent or lessen the development of hip osteoarthritis.

Hip Resurfacing Arthroplasty

Hip resurfacing has been performed for at least 50 years but it was largely abandoned in the 1970s due to a very high failure rate. The failures were due to high friction and excessive wear of the plastic bearing surface. In the 1990s the concept of resurfacing was combined with advances in metal-metal bearings. As a result, resurfacing returned as a viable option. I have been performing hip resurfacing since 2001 as part of an FDA study. The FDA approved the use of resurfacing in the United States in 2006.



In resurfacing surgery, the femoral head and neck are not removed; they are just shaped to accept the prosthesis. As a result, less bone is removed leaving the femoral shaft untouched in case subsequent surgery is needed. Conversion of a resurfacing prosthesis to a conventional total hip is a very easy procedure. Additional benefits of resurfacing are the excellent durability and stability of large diameter metal on metal bearings.

Consequently, patients are more apt to return to a higher level of function than what was traditionally allowed by conventional hip replacement prostheses. It is not uncommon for hip resurfacing patients to ride bicycles competitively, run marathons, climb mountains, ski and do other high impacted activities that would have been forbidden previously by the operating surgeon.



Resurfacing is not suitable for all patients, however, and careful patient selection is key to the success of the procedure. Fracture of the femoral neck can occur in patients with poor bone quality so resurfacing is not typically performed in patients with osteoporosis, inflammatory arthritis (such as rheumatoid arthritis), men older than 65 and women older than 60. Furthermore, there is quite a long learning curve for surgeons before

they are proficient at this technique.

Anterior Surgical Approach to the Hip Joint

There are many different ways to approach the hip joint to perform a joint replacement. Most of them involve cutting through some of the muscles or their tendons around the hip. This may result in more surgical pain and a longer rehabilitation period. One commonly used approach enters the hip joint from the back by cutting the posterior capsule, which can result in dislocation of the prosthetic joint. Most of these approaches mandate some sort of reduced activity and precautions that may be life long.

The direct anterior approach to the hip for joint replacement has gained popularity in North America over the past two years. The surgical approach is not new but a specialized surgical table is now available that facilitates the exposure of the hip. The surgeon enters the hip from the front, between muscles so that no muscles or tendons are cut nor is the posterior hip joint capsule violated. As a result, patients have less pain, a shorter hospital stay, have no postoperative precautions and can bear weight as tolerated immediately after surgery. Patients do exceedingly well and are typically walking with only a cane within a few weeks and with no walking aids by four to six weeks.

This surgical approach can be used for other surgeries as well, such as difficult hip fractures, joint infections and hip impingement or labral injuries not correctable with arthroscopy.

Alternative Bearing Surfaces

The bearing surfaces for hip replacement have traditionally been a metal (cobalt chromium) head articulating with a plastic (ultra-high molecular weight polyethylene) socket. The polyethylene has been found to be the “weak link” in joint replacement as over time it will wear and result in bone loss and prosthetic loosening. Revision of the implant often becomes necessary. This is particularly the case with younger, more active patients.

Polyethylene is still the most commonly used bearing for the socket, but improvements in its

manufacturing have improved its durability greatly. Manufactures now irradiate the polyethylene in an inert environment (i.e. a vacuum or nitrogen) which has improved its wear characteristics. Polyethylene offers a good deal of options to the surgeon (lipped liners, variable head sizes, ability to mate with other manufactures' heads etc.) so it is the preferred choice for most patients older than sixty-five.

Ceramic on ceramic bearings are an option that is a good choice for a younger woman. Manufacturing improvements have reduced the incidence of ceramic fracture but these bearings are best suited for a patient who will not be doing impacting activities. Metal ion release from metal on metal bearings is a concern in women of childbearing years as a result, ceramic on ceramic bearing may be a good choice for these patients. On the down side, ceramic bearings are available in fewer sizes and are more costly than other options.

Metal on metal bearings have been used for over 40 years but it has only been over the past 10-15 years that the metallurgy and manufacturing processes have been perfected to make these bearing widely accepted. Metal on metal bearings are very durable, have low wear rates and are available in very large diameters which further decreases wear and decreases the risk of dislocation. They can be made for resurfacing or a conventional total hip. All these features make metal on metal bearings a good option for younger, more active patients particularly men.

Metal ion release into the body is a concern of this bearing type. Although this issue has been studied for many years, no clearly damaging effects have been identified, nevertheless, metal on metal bearings are not recommended for women who may become pregnant.

Ceramic on metal bearings have less wear and ion release than metal on metal bearings. The head is made of ceramic and the socket side is metal. This is a good bearing for younger women not intending to become pregnant and younger men who do not engage in impacting activity.

Conclusion

Over the past few years, there have been some significant advances in hip surgery. The understanding of hip impingement as a cause of hip pain and subsequent osteoarthritis has led to the treatment of many patients through both open and arthroscopic surgery. Improved instruments and surgeon training has led to the more widespread use of hip arthroscopy to treat many hip conditions, resulting in much less pain and more rapid recovery.

Hip resurfacing preserves bone stock and permits a very high level of function but it is technically more difficult to do than traditional hip replacement surgery and has a higher failure rate particularly in older women with poor quality bone.

The anterior approach to the hip is useful for many procedures of the hip. Hip replacement surgery done through the anterior approach is especially advantageous as recovery and return to full weight bearing is rapid and there is no need to follow the typical hip precautions.

The availability of improved bearing surfaces particularly hard on hard bearings (metal on metal, ceramic on ceramic, ceramic on metal) will likely prolong the lifespan of hip replacements. As a result younger, more active patients can be offered this surgery and they can expect a return to a high level of activity.