Use of Arthroscopy in Orthopedics

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What are the most common arthroscopic surgeries performed in orthopedics?

According to the American Orthopaedic Society for Sports Medicine, the knee and shoulder are by far the most common joints that require arthroscopic surgery, although the hip is increasingly becoming another location for surgery. More than 4 million knee and 1.6 million shoulder procedures are performed worldwide each year. Some of the most common procedures that orthopedic surgeons are familiar with include meniscal repair, ligament reconstruction, repair of cartilage lesions, and rotator cuff repair. Hip arthroscopy has increased in use in the past several years but has not yet made the transition into everyday practice. The most common procedures for hip arthroscopy are for the treatment of femoroacetabular impingement, labral tears, or synovial diseases such as chondromatosis.

Other less common arthroscopic procedures included those done in the wrist, elbow, and ankle. Common procedures for the elbow include releases and lysis of adhesions for arthrofibrosis, whereas the ankle is a more common location for the treatment of cartilage defects through a multitude of techniques including microfracture or autologous chondrocyte implantation. The wrist is another joint that is seeing increased treatment via arthroscopy, with the more common procedures used for ganglion cysts, ligamentous repair, or treatment of damage to the triangular fibrocartilage complex.

What is the role of preoperative imaging in arthroscopy?

A shift in paradigm has occurred in the past 2 decades from arthroscopy being a diagnostic and a therapeutic tool to it being used mostly as a therapeutic option. Hence, in addition to a fo-

In this issue of ORTHOPEDICS, Dr Mont discusses arthroscopic techniques and how to determine when to perform arthroscopic surgery.
cused history and physical examination, a variety of preoperative images ranging from plain radiographs to magnetic resonance imaging scans are used to obtain an accurate preoperative diagnosis. Despite this, arthroscopy often remains the only diagnostic tool of choice for the analysis of certain clinical conditions that may require direct visualization of the joint space. These conditions include plica syndrome or the grading of the severity of chondral and labroligamentous injuries.

What are the benefits of using arthroscopy during surgery?

It provides a minimally invasive solution for a procedure that can otherwise be performed open. The benefits include less soft tissue damage, better visualization, less blood loss, less postoperative pain and stiffness, and quicker rehabilitation. Multiple studies over the past decade have demonstrated the clinical superiority of certain procedures, particularly in the shoulder and knee, when performed arthroscopically versus through a traditional open approach.

What are the risk factors or complications associated with arthroscopy?

Although the complications are joint specific, the majority of complications associated with arthroscopy are minor in nature and the overall incidence rate appears to be low, between 2% to 5%. The rate of major complications is usually less than 1%. Complications may be related to the positioning, establishment of portals, procedure-specific injuries, or general complications involved with arthroscopy. Some of the general complications include infection, stiffness, articular surface damage, sympathetic dystrophy, and injury to cutaneous nerves, vascular structures, and tendons. Despite these reported complications, which are inherent to any surgical procedure, arthroscopy continues to remain an extremely safe procedure in the hands of the orthopedic surgeon.

How do you determine when to perform an arthroscopic procedure?

Currently, other than total joint arthroplasty, most intra-articular procedures that can be performed open are currently being performed through arthroscopic means. A variety of procedures, such as capsulolabral, meniscal, and chondral repair, excision of bone and osteoplasty, and an array of joint preserving techniques, can be performed depending on the clinical indication. In general, if the procedure is amenable to be performed arthroscopically, this option should be discussed with the patient. However, it is important to educate the patient that it may be necessarily to intraoperatively convert from an arthroscopic procedure to an open procedure. This is particularly relevant for patients being treated for knee cartilage injuries. If the lesion is determined to be too large (and thus not amenable to an autologous chondrocyte implantation or similar procedure) during open direct visualization, it may be necessary to convert to an open partial or total knee arthroplasty. The patient must be clearly aware of this possibility.

What research is being done in the use of arthroscopy during surgical procedures?

Over 100 clinical trials are currently being conducted at centers all around the United States and worldwide. Some of the recent ongoing trials include the assessment of the effectiveness of added arthroscopic debridement with high tibial osteotomy in patients with unicompartmental osteoarthritis, use of balloon spacer devices for assessment of central compartment in hip arthroscopy, and arthroscopic autologous stem cell therapy for articular cartilage defects in the knee.

What does the future hold for arthroscopy during surgical procedures?

Arthroscopy has been one of the biggest orthopedic developments of the past century. With the development of 3-dimensional high-resolution cameras, high-definition monitors, advancements in instrument design, expanded surgical indications, and adoption of virtual reality arthroscopy trainings simulators in residency programs, it is anticipated that arthroscopic techniques will further evolve and play an ever greater role in diagnosing and treating joint pathology.

With the advances in arthroscopic technology and microelectronics, scopes are likely to become physically smaller, which will increase access to smaller joint spaces while also decreasing the amount of tissue trauma. Some developments on the near horizon are arthroscopes the diameter of an 18-gauge needle, which may minimize the amount of anesthesia needed for a routine procedure.