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Greetings friends and colleagues,

I hope everyone is enjoying the warm weather. To supplement your summer reading our orthopaedists are sharing their knowledge on topics of interest. Articles this month are:

Early Scoliosis Detection: A Call for Community Screening, Keith P. Mankin, M.D., FAAP

The Timing of Knee Replacement Surgery, John B. Chiavetta, M.D.

Basal Joint Arthritis of the Thumb, Harrison G. Tuttle, M.D.

If you have questions or want to contact one of our docs, please call our triage nurse at 919-863-6877 and we will put you in touch. Thank you for trusting us with the care of your patients.

Sincerely,

G. Hadley Callaway, M.D.
President, Raleigh Orthopaedic Clinic

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Early Scoliosis Detection: A Call for Community Screening

Keith P. Mankin, M.D., FAAP

Scoliosis continues to be a major problem in teenage years. It is estimated that one child in 100 will have a detectable curvature. Although most curves will not progress or be clinically significant, approximately 10 percent will go on to require some level of treatment, either bracing or surgery. It is estimated that more than one million spinal fusions are performed for scoliosis on a yearly basis.

Although scoliosis typically does not cause any major medical problems, even a smaller curvature may lead to severe pain in late adolescence or adulthood. Far harder to determine is the psychological distress that a large curvature may cause in the already fragile ego of a maturing teenager. At a time of life when even minor features such as freckles may be a source of self-consciousness, a truly deforming process like scoliosis can be devastating.

There are good treatments available to help slow progression of smaller curvatures, but the challenge arises to recognize the process before it becomes severe enough to create a significant deformity. Since understanding of the process does not allow medical reversal of scoliosis, the only treatment options involve detecting the curve and holding it in place, or, if it becomes too severe, fixing the alignment of the spine so that is more balanced and more normal.

Thus, the most important line of treatment, as with all disease, is early detection. Most communities have various strategies in place to try to detect scoliosis early. Many school systems still provide annual screenings for children at the high risk age (10-14). These screenings tend to be performed in large group settings by nurses and have mixed results. Many of the nurses have only rudimentary training in screening guidelines. The screenings may detect upper body curves, but because they look largely at shoulder and thoracic symmetry, large lumbar curves may be missed. Also, because of the public nature of the screening, curves may be hidden in loose or baggy clothing and may be overlooked. With public funding issues, schools may not be able to provide screenings at all.

Pediatric providers may perform screenings on well child visits for children in high risk years of growth. Most children in this setting change into gowns for better exposure of the back. The private setting allows the practitioner to ask more detailed questions about back or neurologic issues, focusing the examination on problem

areas. However, many pediatricians and family practitioners have not had formal training in screening and so may still miss certain findings on the examination.

Pediatric orthopaedic practitioners are portably best equipped to screen for curvature. They have the appropriate training, have the facilities for private examinations and most often have the most experience in detection and treatment. The major issue is access. Pediatric orthopaedists do not generally have the opportunity to see children in a primary care setting to perform the screenings, and the orthopaedic clinic is not set up for large numbers of well children visits.

The most expedient compromise would be the establishment of community screening clinics, in much the same way that sports physicals are organized for high school students. A number of practitioners, both from the orthopaedic and the pediatric ranks, could be enlisted to examine children at a central facility. The children would be encouraged to wear sports clothing or bathing suits to allow a fairly close examination of the spine without need for changing into gowns. At the same time, small curtained areas or cubicles could be set up for the examination to allow the practitioner to be as thorough as needed while maintaining the privacy that teenagers require. Chaperones would need to be provided for male practitioners since the vast majority of at risk children are female.

Most importantly, in preparation, the orthopaedic providers would instruct the general providers on proper spinal screening techniques. A simple five- or six-point examination generally suffices that would observe both the upper and lower spines, noting symmetry of the hips as well as the shoulders. The orthopaedic provider would then be available to provide consult on cases of concern as well as screenings themselves.

Such an endeavor is readily conceivable in an area where there is good communication among pediatric providers and the community at large. Issues of venue availability, marketing to mobilize the patient base and budgetary concerns would need to be addressed. Public health officials, hospitals and the community may need to be enlisted for funding and logistical help. The need, however, for appropriate early screening for scoliosis is very urgent and, with a minimum of exertion, very attainable. ●



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The Timing of Knee Replacement Surgery

John B. Chiavetta, M.D.

Knee replacement surgery is widely regarded as one of the most successful operations of the past four decades. Between 80-90 percent of patients are pleased with the results after surgery and 85-90 percent of knee replacements are still functioning well more than 20 years after the operation. The procedure typically is able to relieve pain and restore function with a low complication rate.

Knee replacement patients are younger and more active than ever before. More middle-age patients are committed to remaining active and are determined not to let arthritis pain cause them to become sedentary. This can mean joint replacement surgery at a young age. Patients and physicians alike often grapple with determining the best time to proceed with knee replacement surgery.

Knee replacement surgery is an elective operation and generally reserved for those who have failed more conservative management. Before knee replacement surgery it is important to have tried various pain relieving medications including acetaminophen and/or NSAIDs. Cortisone injections and viscosupplementation injections (e.g. Synvisc, Hyalgan, Orthovisc) also can be helpful for pain relief associated with knee arthritis. Glucosamine and chondroitin sulfate is widely used but there is little evidence to support its use. If the aforementioned have failed to give long-term pain relief then knee replacement surgery may be an option.

In the hands of an experienced joint replacement surgeon the operation generally takes under an hour. On the day of surgery, the patient is usually walking and putting full weight on the leg. The typical hospital stay is two or three nights. Rehab stays are available for patients who are more debilitated, or for those lacking a good support network at home during the initial recovery period.

The recovery period following knee replacement is variable. Some patients, especially those with more severe arthritis can feel fully recovered within four weeks of surgery. Others may take three to six months. Physical therapy is an important component of the recovery, particularly in those who have more stiffness or muscle weakness. Formal physical therapy sessions can last anywhere from a couple of weeks to four months after surgery.

Activity after knee replacement surgery is encouraged. Most patients can safely bike, swim, golf, use elliptical trainers or walk for exercise. High impact activities are generally discouraged because they may cause excess wear on the prosthesis. However, many knee replacement patients can participate in high impact activities, and some have even completed marathons.

Knee replacement surgery is generally performed on patients who experience a minimum of several months of severe knee arthritis

symptoms. These symptoms usually cause difficulty with daily activities such as standing more than 10 or 15 minutes, going on short walks, shopping or getting up from a seated position. The natural history of knee arthritis is slowly worsening pain and stiffness, so the outlook in a patient with severe arthritis is grim. After a thorough explanation of the risks, benefits and alternatives to surgery, the patient will make the final decision about surgery with guidance from their physician.

Age is an important factor in determining when to perform knee replacement surgery. Due to the limited longevity of the prosthesis, it is generally advisable to wait as long as one reasonably can. Younger, more active patients tend to wear out knee replacements faster than older and more sedentary patients. The average lifespan of a knee replacement is between twenty and thirty-five years. Therefore, caution should be exercised when recommending surgery to a patient who may outlive their knee replacement. It is common to see patients in their fifties who are in too much pain to go on walks with their spouse, play outside with their kids or enjoy traveling. The concept of living with that pain in their fifties so they can avoid another operation in their seventies doesn't make sense to many patients.

Some patients with more moderate symptoms argue that they have a knee replacement while they are in good health rather than waiting until they are older and their health may be compromised. Orthopedic surgeons generally discourage this for a variety of reasons, including the small risk of major complications including infection, pulmonary embolism, and major cardiac complications. Most patients are willing to tolerate a mild to moderate degree of pain when these risks are properly explained to them.

Obesity is another factor which can affect the timing of knee replacement surgery. While it is usually advisable for patients to be at a healthy weight at the time of surgery, excess weight usually is not prohibitive. Most studies of obese patients undergoing knee replacement surgery show excellent pain relief and a risk of complications comparable to patients of normal BMI. However, the super-obese patients (BMI >50) do have a well-documented higher risk of complications and should consider more aggressive forms of weight reduction before undergoing knee replacement surgery.

Ultimately the decision about when to perform knee replacement surgery is up to the patient. It is the orthopedic surgeon's responsibility to completely explain the risks associated with the procedure and the limitations after knee replacement surgery. The vast majority of the time, a well-informed patient will make the right decision about when knee replacement surgery is appropriate for their particular situation. ●



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Basal Joint Arthritis of the Thumb

Harrison G. Tuttle, M.D.

OVERVIEW

The basal joint of the thumb, or first CMC joint as it is often called, is the most common location in the hand to be symptomatic from osteoarthritis. The basal joint of the thumb is the articulation between the first metacarpal and one of the bones of the carpus called the trapezium. Thus for simplicity of discussion, we refer to this as the first CMC joint. This joint is shaped like a saddle which facilitates motion in two separate planes: Flexion/extension and abduction/adduction. The frequency of basal joint arthritis may be due to the high compression forces exerted across the base of the thumb. It has been shown in biomechanical studies that the forces exerted across the basal joint are 14 times higher than the force exerted at the tip of the thumb and index finger during pinch. Thus it is the shape of the joint as well as the forces exerted across this joint that give it its propensity for arthrosis. We find that more frequently it is the non-dominant hand that is affected since that is the hand where high-strength pinching and grasping occur, leaving the dominant hand able to perform finer motor tasks.

SYMPTOMS

Patients with first CMC joint osteoarthritis typically experience aching pain at the base of the thumb during pinching and grasping. The patients tend to experience these symptoms more in the thenar eminence palmary and often do not immediately recognize their symptoms as coming from the basal joint. Since the basal joint is at the corner of the carpal tunnel in the wrist, when patients are symptomatic from first CMC joint osteoarthritis, they may also concomitantly experience symptoms of carpal tunnel syndrome and also complain of numbness and tingling in the thumb, index, and middle finger. Some patients may also notice some difficulty with sleeping.

EXAMINATION

On physical examination, careful inspection often reveals a prominence at the base of the thumb. Sometimes there is considerable swelling. The adjacent joints should also be inspected as laxity or arthrosis at the thumb metacarpophalangeal joint (the MCP joint) can often affect treatment. Patients often have fairly dramatic reproduction of symptoms with palpation of the first CMC joint. The first CMC joint should also be stressed to detect whether or not there is laxity. Other causes of pain at the base of the hand or the thumb include flexor carpi radialis tendonitis, trigger thumb, de Quervain's tenosynovitis, or laxity at the first CMC joint without evidence of arthrosis. Thus, these other diagnoses should also be evaluated on examining the hand for first CMC joint osteoarthritis.

RADIOGRAPHS

Typically three views of the thumb are adequate to confirm the diagnosis: an AP, lateral, and a Bett's. The Bett's view, otherwise referred to as a CMC joint view, will show classic changes of basal joint arthrosis which are joint space narrowing, subchondral sclerosis of the first CMC joint, and osteophyte formation. Again, the adjacent joints should also be inspected, specifically the scaphoid-trapezoid-trapezium joint since radiographic changes of this joint could potentially affect treatment as well.

TREATMENT

Treatment of basal joint arthrosis is most commonly non-operative. Of course the least invasive thing that can be suggested is intermittent oral anti-inflammatory medications or activity modification, but more commonly, patients need the assistance of a brace to reduce symptoms of first CMC joint osteoarthritis. There are some "off-the-shelf" splints that are very effective for first CMC joint osteoarthritis, but most patients find that they are a bit more cumbersome. Patients who experience good symptom control with a brace often prefer to have one custom made. The brace that we typically prescribe for basal joint arthrosis is a hand-based splint, meaning it is applied around the hand so the wrist is free and extends to the thumb MCP joint. This brace effectively offloads the basal joint but still allows most range of motion of the thumb so that pinching and grasping are comfortable. Most patients' everyday activities are not affected much by the brace. Patients are advised to wear it during "provocative" activity, which means activity that causes their symptoms. Thus, intermittent use of the brace often leads to satisfactory function of the hand.

If, however, patients' symptoms persist despite use of the brace, our next option is to proceed with a first CMC joint injection. These injections are quite reliable in giving excellent if not complete symptom relief from first CMC joint arthrosis. Most patients experience complete or near complete relief of their symptoms for three to six months after these injections. They can be repeated intermittently if good pain relief is achieved. The first CMC joint is often fairly small, but typically a 5/8-inch 25-gauge needle is used to penetrate the joint. Careful preinjection localization of the joint is necessary which often requires some gentle distraction of the thumb and a little flexion to open the joint for the needle. The joint accommodates approximately one ml of fluid, usually a combination of a local anesthetic and an injectable corticosteroid.

The last resort for treating CMC joint arthrosis, of course, is surgical. The standard of care for surgical treatment of first CMC joint arthrosis involves excision of the trapezium which results in



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resolution of the bone-on-bone pain. Usually hand surgeons will also reconstruct the ligaments at the first CMC joint at the time the trapezium is excised, theoretically resulting in more stability at the base of the thumb postoperatively with pinching and grasping. There are several variations of this procedure, each of which has its proponents and all of which have been shown to be successful. None of these variations have clearly been shown to be the preferred method. Each method generally results in 90 percent of results rated "Excellent." Patients are always told that there is a fairly long recovery process involving considerable therapy. Studies indicate that patients improve for up to one year after the procedure. There are rarely some scenarios in which patients

should have a first CMC joint fusion instead of an excision of the trapezium. There are also clinical scenarios in which the adjacent joints should be addressed to achieve better long-term results. Thus again, the adjacent joints should also be evaluated when assessing the patient preoperatively for first CMC joint arthrosis.

SUMMARY

Basal joint arthrosis is very common and causes considerable difficulty with pinching and grasping, but can be fairly readily treated with a brace and injection. If surgery is necessary, excellent long-term results can be accomplished restoring patients' function with work, sports and everyday activities. ●

