Ankle Arthroscopy: Common Questions

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What is ankle arthroscopy and what are the goals of the procedure?
Ankle arthroscopy is a minimally invasive surgical procedure orthopaedic surgeons use, which allows visualization, diagnoses, and treatment of problems in the ankle joint. Ankle arthroscopy utilizes a pencil sized fiberoptic video camera (arthroscope) that can magnify and transmit images inside the ankle to a video screen. Sterile fluid is also circulated through the ankle to temporarily expand the joint. This allows space for the arthroscope and other small instruments utilized in the surgery.

Indications for ankle arthroscopy
Ankle arthroscopy, in the appropriate circumstances, can be used as an alternative or in conjunctions with open ankle surgery. Open ankle surgery utilizes larger incisions to visualize the inside of the ankle. Arthroscopy can be used to diagnose and treat different disorders of the ankle joint. The list of problems that this technology can be used for is constantly evolving, but includes:

1. **Osteochondral defect** *(also referred to as OCDs, osteochondritis dessicans, osteochondral fractures)*- These are localized areas of damaged cartilage and bone in the ankle joint. OCDs are usually caused by injuries to the ankle, and often associated with ankle fractures, sprains, or persistent giving way or turning of the ankle. Common symptoms include persistent ankle pain, swelling, catching, clicking and decreased range of motion. The diagnosis is made with the combination of a detailed physical exam of the ankle and imaging studies, which may include x-rays, MRI, CT scan and/or bone scan. These imaging studies provide important information which help guide treatment options. The treatment will be based on the size, location, stability of the OCD, symptoms, and activity demands of the patient. Surgical treatment options typically include microfracture (with or without removal of the osteochondral fragment), fragment fixation, and bone or other biologic grafting procedures. These procedures can often be performed arthroscopically. Thorough discussion with your surgeon is necessary to determine which option is most appropriate for you.

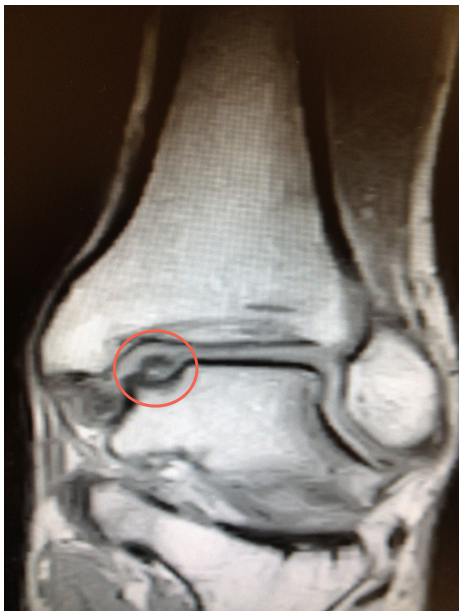

Figure 1 MRI of osteochondral defect of talus

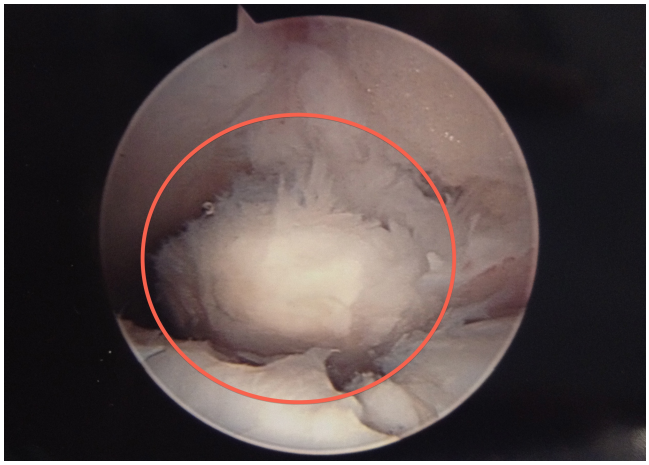

Figure 2 Arthroscopic image of OCD from Figure 1

2. Anterior ankle impingement (also *referred to as "athlete's ankle" or "footballer's ankle")* – Anterior ankle impingement includes anteromedial (inside of ankle) and anterolateral (outside of ankle) impingement. These occur when either bone and soft tissue of the front of the ankle joint becomes inflamed due to repetitive stress or irritation. Anterior ankle impingement is common in athletes but may also occur in the non-athletic population. Symptoms include ankle pain, swelling, and can limit motion of the ankle, especially dorsiflexion (loss of the ability to bend your ankle upwards). Walking uphill is often painful. The diagnosis of anterior ankle impingement begins with a careful physical

exam. Osteophytes, or "bone spurs," can be seen on standard x-rays of the ankle. A slightly tilted x-ray view of the foot (oblique) tends to show anteromedial impingement bone spurs very well.[16] This type of impingement occurs often in soccer players and gymnasts.[7] It is thought tissue on the inside of the ankle constantly tugs and/or rubs on the bone and can cause the bone spur. Another theory is that the bone spurs arise from the soccer ball repeatedly striking that area. Sometimes an MRI will be recommended to identify redundant and inflamed soft tissues which can not be seen with standard x-rays. This is considered anterolateral impingement. This type of impingement often manifests after ankle sprains. If nonoperative measures fail to relieve symptoms of either of these conditions, ankle arthroscopy can be used to shave away redundant inflamed tissues and/or bone spurs.[8]

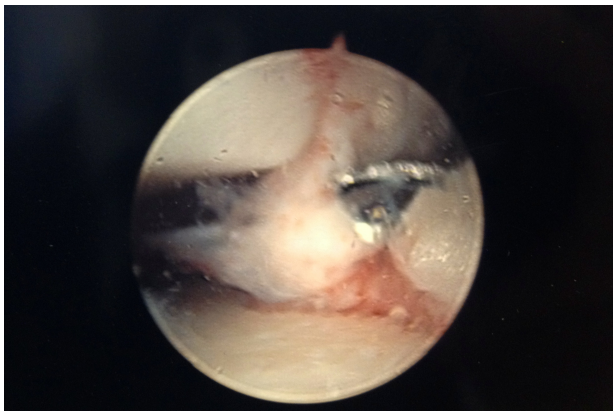

Figure 3 Arthroscopic image of shaver removing inflamed redundant soft tissue impingement lesion

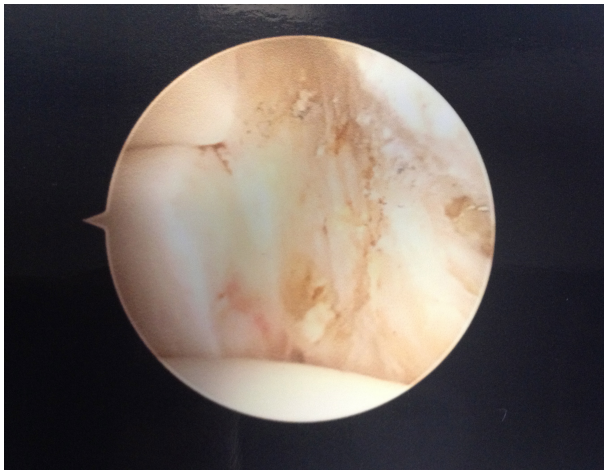

Figure 4 Arthroscopic image after impingement lesion removed

Figure 5 Oblique foot x-ray showing anteromedial impingement bone spu

Figure 6 X-ray of anterior impingement bone spur

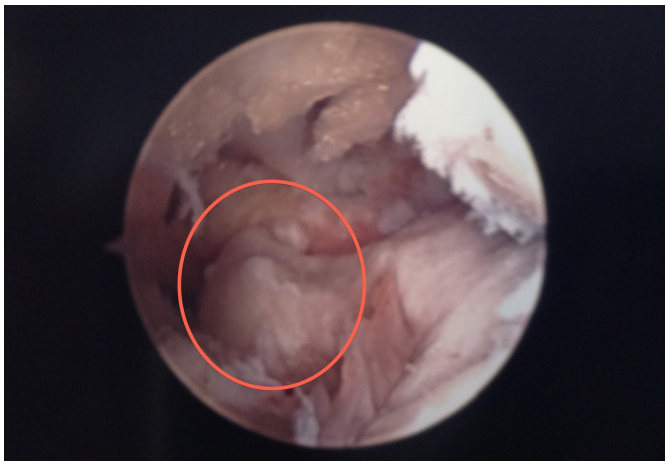

Figure 7 Arthroscopic image of anterior impingement bone spur from Figure 6

3. Posterior ankle impingement- This occurs when the bone and soft tissue of the back of the ankle becomes inflamed due to repetitive stress. This will cause pain in the ankle joint, swelling, and often times limited motion of the ankle, especially plantarflexion (pointing the foot down). This overuse syndrome occurs most

commonly in dancers, but can also be seen in other athletes. It is often associated with an accessory bone, referred to as an *os trigonum.* Surgical treatment involves placing arthroscopic incisions in the back of the ankle to access the painful area. Bone spurs, inflamed soft tissue, and if present, the *os trigonum,* can then be removed arthroscopically. An important artery and nerve lie in the region of the arthroscopic portals and may be at risk during posterior ankle arthroscopy.

Figure 8 Lateral x-ray showing an os trigonum in posterior ankle

3. Synovitis- Synovitis is inflammation of the soft tissue lining of the ankle joint (synovium) that will often manifest as pain, swelling, and loss of motion. This can occur due to an acute or chronic injury, inflammatory arthritis (i.e. rheumatoid arthritis), overuse, and degenerative joint disease (osteoarthritis).[14] If nonsurgical treatment options fail to provide relief, ankle arthroscopy can be used to surgically remove inflamed synovium.

4. Loose bodies- Cartilage, bone, and/or scar tissue can become free floating in the joint and form what is referred to as a "loose body". These can also occur within the setting of a condition called synovial chondromatosis, where the lining of the joint becomes redundant for unexplained reasons. These loose bodies can cause problems such as clicking, catching, swelling, loss of motion, and frank locking that often lead to pain. Imaging studies may be used to identify a loose body including a standard x-ray, CT scan, and MRI. Ankle arthroscopy can be used to find and remove the loose body.

Figure 9 Arthroscopic image of a loose body

5. **Arthrofibrosis-** Sometimes previous trauma, prior ankle surgery, infections of the ankle joint, and inflammatory arthritis predisposes patients to the development of scar tissue, or *arthrofibrosis.* Ankle arthroscopy can be used to identify this scar tissue and remove it.

6. **Infection-** Septic arthritis, or infection of the joint space, cannot be treated effectively with antibiotics alone. It often necessitates an urgent surgery to wash out the joint. This can be done as an open procedure or with an arthroscopy. Although infections of the skin and soft tissue around the ankle joint preclude ankle arthroscopy in most settings, septic arthritis, can be an indication for ankle arthroscopy. The decision of whether or not an infection is amenable to arthroscopic surgery is determined by many factors. Only you and your surgeon can determine whether or not it is appropriate for you.

7. **Ankle fractures-** Ankle arthroscopy may be used along with conventional open techniques of fracture repair to ensure normal anatomic alignment of cartilage within the ankle is restored. It may also be used during ankle fracture repair to evaluate for any concomitant cartilage injuries inside the ankle.

8. **Unexplained ankle symptoms-** Occasionally patients develop symptoms such as pain, swelling, locking, catching, grinding, or popping that cannot be explained with diagnostic techniques such as x-rays, CT scans, MRIs, or bone scans. When non-operative measures have been exhausted, ankle arthroscopy can be used to diagnose lesions within the ankle joint. It provides the opportunity to look directly into the joint, identify potential problems, and definitively treat many of them.

9. **Ankle arthritis-** Ankle fusion is a treatment option appropriate for many patients with end-stage ankle arthritis. When performed by an experienced surgeon, ankle arthroscopy offers a minimally invasive way to perform ankle fusion that may yield results that are equal to or better than conventional open techniques.[4,5] This

procedure has its limitations. Your surgeon can determine if this procedure is appropriate option for you.

10. Ankle instability- When the stabilizing ligaments of the outside of the ankle become stretched out, persistent giving way or turning of the ankle can ensue. This most commonly occurs as a result of an untreated ankle sprain, or multiple ankle sprains. Patient symptoms include pain and swelling about the outside of the ankle. Difficulty with walking or running on uneven ground is also common. High arched feet (cavus feet) can also be an underlying cause of ankle instability. [6] In patients whom fail conservative treatment including bracing and physical therapy, tightening of the chronically injured ligaments can be performed. This technique has its limitations, and your surgeon can determine if this procedure is an appropriate option for you.

Contraindications to ankle arthroscopy?

Elective arthroscopy is contraindicated in patients with soft tissue infections of the ankle such as cellulitis, acute and chronic open wounds, and dermatitis overlying the ankle. Patients with severe arthritic changes with loss of the joint space are not good candidates for arthroscopic debridement procedures. Patients with severe peripheral vascular disease, peripheral neuropathy, reflex sympathetic dystrophy/complex regional pain syndrome, and edema may not be eligible for ankle arthroscopy. It is important to thoroughly discuss your individual risks, potential benefits, and the alternatives to ankle arthroscopy with your surgeon.

General considerations of ankle arthroscopy

Ankle arthroscopy is generally performed as an outpatient surgery under general anesthesia with or without a regional pain block or epidural anesthetic with sedation. The type of anesthesia will be determined in conjunction with the surgeon, patient and anesthesiologist. Generally the patient will need to refrain from eating or drinking after midnight the night before surgery. Your surgeon will require any blood-thinning medications including Aspirin, Coumadin, and anti-inflammatories to be stopped for a period of time prior to surgery. Specific medications should be reviewed with your surgeon. Transportation to and from surgery will be required.

Specific techniques and detail of ankle arthroscopy

Prior to being taken to the operating room, the surgeon will mark the operative leg with a marker. The patient will then be transported to the operating room, and adequate anesthesia is established. A tourniquet is applied to the leg and the leg is prepped and draped in a sterile fashion. Mechanical distraction devices are sometimes used to help surgeons temporarily enlarge the potential space of the ankle. After the foot and ankle are appropriately positioned, at least two, 3-5mm incisions are made in ankle. These incisions become the entry sites into the ankle, or portals, for the arthroscopic camera and instruments. These portals are placed strategically in an effort to avoid vessels and nerves. The incisions are made in the

front or back of the ankle, or a combination of these. Sterile fluid is then allowed to flow through the ankle to further open the joint. The camera and instruments can then be exchanged between portals to perform the surgery.

At the conclusion of the procedure, small sutures are placed in the skin to close the portals. A sterile compressive dressing, and sometimes a splint or boot (based on the nature of the procedure), are then applied.

Recovery and post-operative care

This will ultimately depend on the type of problem and nature of the arthroscopic procedure performed. Patients can expect pain and swelling following surgery that necessitates elevation of the leg and oral pain medication for at least several days. The type of procedure performed will determine whether you will be able to bear weight on the affected leg. Weight bearing status may range from being able to immediately place weight on the leg, to no weight for several months. Your dressing will be left in place until follow-up with your surgeon, and sutures will be removed one to two weeks after surgery. It will be up to your surgeon when activities such as range of motion and ankle exercises are allowed and whether formal physical therapy is necessary.

Potential complications

Potential complications of ankle arthroscopy include, but are not limited to, injury to nerves, vessels, tendons, ligaments or cartilage about the ankle, deep and superficial infections, scarring, reflex sympathetic dystrophy/complex regional pain syndrome, missed diagnoses, broken instruments, and anesthetic complications.[11] It is important to attend follow-up appointments with your surgeon following surgery as recommended.

The following symptoms should be urgently reported to your surgeon, as they may be an indication of a complication:

-Pain not controlled by pain medication

-Constitutional symptoms including nausea, vomiting, fevers, or chills

-Wound redness, swelling, warmth or foul smelling drainage

-New numbness, weakness, or tingling.

Frequently asked questions

When can I safely return to driving? This will be determined by the type of procedure you undergo and your surgeon's evaluation of your progress. When you are able to bear weight without limitation and are no longer taking narcotic pain medication you will likely be cleared to return to driving.

When can I expect to return to work/sports?

This will be determined by the type of procedure you undergo and your surgeon's evaluation of your progress. If your mobility allows you to safely complete your job duties, there is the possibility of returning to work several days after surgery. Most patients can expect to be out of work for at least one to two weeks while they recover. It is possible to return to high level sports following ankle arthroscopy.[3,5] This will depend on your ability to protect yourself effectively and perform during your particular sporting activity. Athletes could be cleared to return to play at as early as one to two weeks, but in all likelihood can expect an excess of four to six weeks.

What are the outcomes of ankle arthroscopy?

Many factors will contribute to the outcome of your ankle arthroscopy procedure. These include, but are not limited to: your expectations, the severity of your condition, complexity of the procedure performed, as well as post-operative compliance, rehabilitation and motivation. The literature shows that an average of greater than 70-90% of patients undergoing ankle arthroscopy for the most common indications achieve good or excellent results. [1,2,13,14,17,18]

What are the advantages of ankle arthroscopy?

Ankle arthroscopy makes possible direct visualization of the inside of the ankle without large cosmetically unsightly scars. It minimizes other problems encountered with large incisions around the ankle such as pain, bleeding, wound breakdown, and infection. The procedure can be performed as an outpatient because of its minimally invasive nature. Patients may be able to begin rehabilitation sooner, rehabilitate more functionally, and return to high level activities such as sports.[3-5,10] Ankle arthroscopy cannot be performed in all instances and a thorough discussion with your surgeon will determine if you are a candidate.

1. Amendola, A.; Petrick, J.; and Webster-Bogaert,S.: Ankle arthroscopy: outcome In 79 consecutive patients. *Arthroscopy,* 12(5): 565, 1996

2. Baums, M. H.; Kahl, E; Schultz, W.; and Linger, H.M.: Clinical outcome of the arthroscopic management of sports-related "anterior ankle pain": a prospective study. *Knee Surg Sports Traumatol Arthrosc,* 14(5): 482-6, 2006

3. Calder, J.D.; Sexton, S.A.; and Pearce, C.J.: Return to training and playing after posterior ankle arthroscopy for posterior impingement in elite professional soccer. Am J Sports *Med, 38(1): 120-4, 2010*

4. Cutsuries, A.M.; Saltrick, K.R.; Wagner, J.; and Catanzariti, A.R.: Arthroscopic arthroplasty of the ankle joint. *Clin Podiatr Med Surg,* 11(3): 449-67, 1994

5. DeBarardino, T.M.; Arciero, R.A.; and Taylor, D.C.: Arthroscopic treatment of soft-tissue impingement of the ankle in athletes. *Arthroscopy,* 13(4): 492-8, 1997

6. Desai, S.N.; Grierson, R.; and Manoli, A. 2nd: The cavus foot in athletes: fundamentals of evaluation and treatment. *Op Tech Sports Med,* 18(1): 27-33, 2010

7. Manoli, A 2nd: Medial impingement in the ankle of athletes. *Sports Health,* 2(6): 495-502, 2010

8. Murawski, C.D. and Kennedy J.G.: Anteromedial impingement in the ankle joint: outcomes following arthroscopy. *Am J Sports Med*, 38(10): 2017-24, 2010

9. Myerson, M.S. and Quill, G.: Ankle Arthrodesis. A comparison of an arthroscopic and an open method of treatment. *Clin Orthop Relat Res,* (268): 84-95, 1991

10. Scranton, P.E. Jr.; and McDermott, J.E.: Anterior tibiotalar spurs: a comparison of open versus arthroscopic debridement. *Foot Ankle,* 13(3): 125-9, 1992

11. Stetson, W.B.; and Ferkel, R.D.: Ankle Arthroscopy: I. Technique and Complications. *J Am Acad Orthop Surg,* 4(1): 17-23, 1996

12. Stetson, W.B.; and Ferkel, R.D.: Ankle Arthroscopy: II. Indications and Results. *J Am Acad Orthop Surg,* 4(1):24-34, 1996

13. Van Dijk, C.N. Hindfoot endoscopy. *Foot Ankle Clin,* 11(2): 391-414, vii, 2006

14. Van Dijk, C.N.; Tol, J.L.; and Verheyen, C.C.: A prospective study of prognostic factors concerning the outcome of arthroscopic surgery for anterior ankle impingement. *Am J Sports Med,* 25(6): 737-45, 1997

15. VanDijk, C.N.; and van Bergen,C.J.: Advancements in ankle arthroscopy. *J. Am Acad Orthop Surg* (16)11: 635-46, 2008

16. Van Dijk C.N.; Wessel R.N.; Tol J.L.; Maas, M.; Oblique radiograph for the detection of bone spurs in anterior ankle impingement. *Skeletal Radiol*, 31(4):214-

221, 2002

17. Verhegen, R.A.; Struijs, P.A.; Bossuyt, P.M.; and vanDijk, C.N.: Systematic review of treatment strategies for osteochondral defects of the talar dome. Foot Ankle Clin, 8 (2): 233-42, vii-ix, 2003

18. Willits, K.; Sonneveld, H.; Amendola, A.; Giffin, J.R.; Giffin, S; and Fowler, P.J.: Outcome of posterior ankle arthroscopy for hindfoot impingement. *Arthroscopy,* 24(2): 196-202, 2008