

Ankle Arthroscopy

Dr. Deepak Sahastrabuddhe,

Sahastrabuddhe Hospital, Station Road, Kolhapur - 416 001.

Over the last decade Ankle arthroscopy has become an important tool in diagnosis and treatment of numerous pathologies. As Endoscopic procedures are performed using small incisions through which instruments are passed, thorough knowledge of the anatomy, relationship of various structures in respect to the portals is essential. Possible anatomic variations should also be considered to avoid technical errors.

Indications

1. Removal of Loose bodies.
2. Synovitis.
3. Osteochondral lesions.
4. Soft tissue impingement syndromes.
5. Arthroscopic ankle arthrodesis.
6. Treatment of intra-articular fractures.
7. Treatment of intraarticular infections.

Contraindications

It is an elective procedure, so the patient should be in the best possible state of health.

Coexisting medical conditions should be adequately controlled.

1. Local infection.
2. An extensive capsuloligamentous injury is a relative contraindication, as it may cause excessive fluid extravasation.

Instruments

Basically same instruments are used as in Knee arthroscopy.

Distraction

The ankle joint space is narrow and hence some form of distraction is needed to pass the instruments. This distraction can be achieved by manual traction or with a mechanical distractor.

Anesthesia

General anesthesia, Spinal or Epidural anesthesia can be used.

Position

The patient is positioned supine with foot 15-20 cm past the end of operating table. This position allows access to ankle from all sides and permits the use of posterior portals.

Tourniquet

The tourniquet is used for all arthroscopic procedures.

Portal Placement

For Ankle arthroscopy anterior, posterior, transmalleolar, and transtallar portals are used. First the bony structures about the ankle are palpated to establish orientation.

The malleoli are key landmarks, they are easily palpable. The tip of the lateral malleolus is 1.5 cms distal and slightly posterior to the medial malleolus. The anterior joint space is 2 cms proximal to the medial malleolus. On the anterior surface, tendons of Tibialis Anterior, Extensor hallucis longus Extensor digitorum longus and the neurovascular bundle, on the posterior surface the Tendo Achilles the poster medial neurovascular bundle, are marked. The bony and the joint line should be marked with the skin marker pen. The landmarks are essential for

proper positioning of the portals. Certain principles must be followed during portal placement.

1. Use of incisions only to cut the skin. Incisions are placed parallel to the neighboring tendinous and vascular structures.

2. Use a mosquito clamp for blunt dissection until joint capsule is reached.

3. Use of blunt trochars to avoid injury to the articular cartilage.

4. Use of arthroscopy sheaths without lateral windows to avoid leaking of irrigation fluid.

5. Use of arthroscopy canula to introduce motorized instruments.

Arthroscopic Portals Described for Ankle Joint

Anterior Portal

- Anteromedial
- Anterolateral.
- Anterocentral.
- Medial midline.
- Accessory anterolateral.

Posterior Portals

- Posteromedial.
- Accessory posteromedial.
- Trans Achilles.
- Posterolateral.
- Accessory Posterolateral.

Transmalleolar

- Medial.
- Lateral.

Trans Talar

- Medial.
- Lateral.

*** Anterior Portals ***

Anteromedial

The AnteroMedial Portal is the first portal to be established. It is established just medial to the Tibialis anterior tendon at the anterior joint line of

the ankle coinciding with the soft spot, which is visible and there is a visible depression seen when the ankle is dorsiflexed. The long saphenous vein and the saphanous nerve are at risk during portal is made.

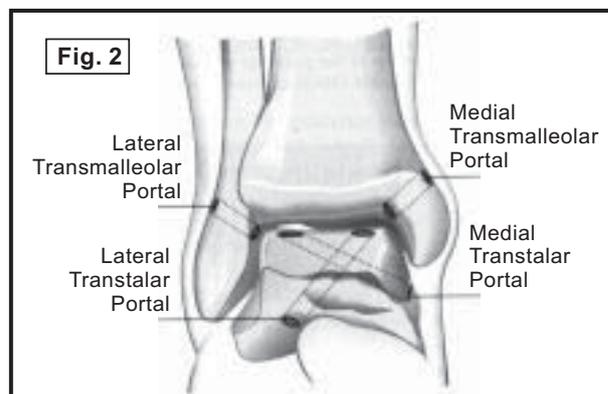
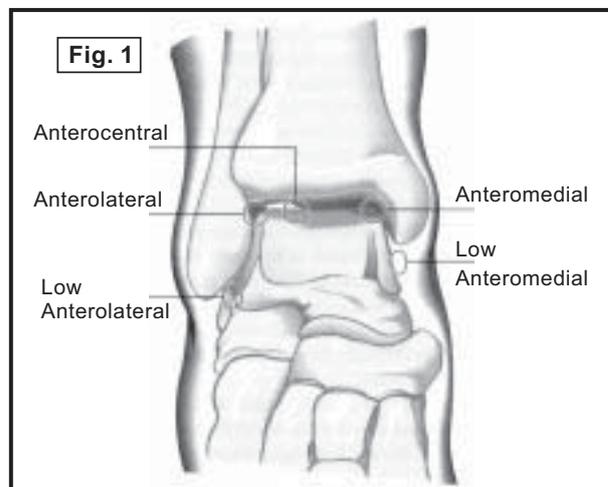
Anterolateral

It is created at the anterior joint line just lateral to the Extensor digitorum tendon. At risk are short saphaneous vein and the superficial cutaneous branch of the superficial peroneal nerve.

Anterocentral

It is placed lateral to Extensor Halucis longus tendon, at the level of joint line. This portal provides a wide field of view.

This portal has significant disadvantages. An arthroscope in this portal passes only a very short distance into the joint, and can easily slip out of the joint space. Also use of this portal is associated with high risk of injury to neurovascular structures. Hence this portal is not recommended.



Posterior Portals

Because of the anterior posterior convexity of the ankle joint, the posterior joint line is located 4-6 mm distal to the anterior joint line and is difficult to palpate.

Posterolateral Portal

It is most widely used posterior portal. Is located 1-2 cms proximal to the tip of lateral malleolus, lateral to the tendoachillis. It is used to inspect the posterior talar dome and posterior aspect of mortise. The sural nerve is very close to the portal and is at risk of injury. This portal is made in an outside- in technique.

Trans Achilles Portal.

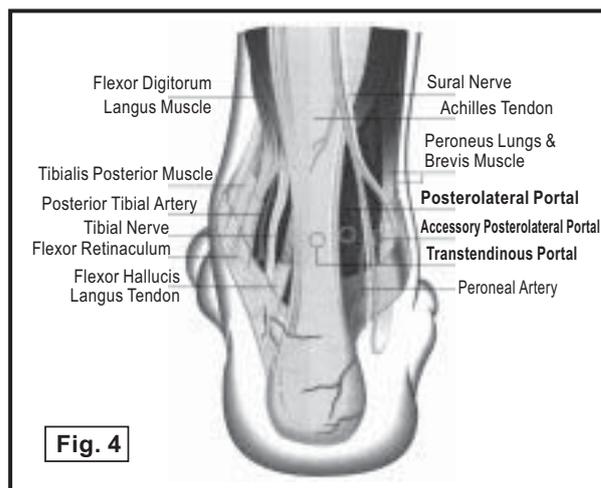
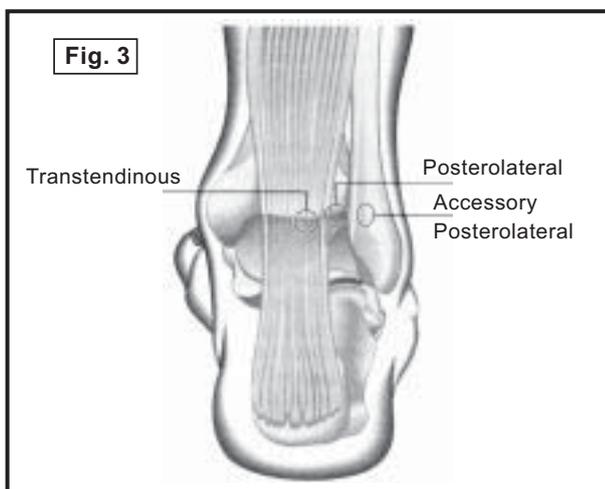
This portal was described by Vato et al, to obtain a wide field of view of the posterior compartment. This portal is established through the centre of the T A tendon. This portal is not commonly used, and is not recommended by some Authors.

Posteromedial Portal

This portal is made adjacent to medial axis of TA. At level of joint line.

This portal is not recommended because of risk of injury to medial neurovascular structures.

Although many portals have been described, in majority of cases only three: the anteromedial the anterolateral and the posterolateral portals are needed to do an diagnostic and therapeutic arthroscopy.



Placement of Arthroscopy Portal

The anterolateral portal is the standard primary portal. The sheath insertion is done in a well defined sequence of steps.

1. Palpation of joint line : The joint line is located 3 cms proximal to the tip of the lateral malleolus. It is palpated by dorsiflexion and planterflexion of ankle.

2. Needle test : First an 18-20 gauge needle is introduced into the joint. The needle is moved in the joint medially- laterally, superiorly and inferiorly to conform intraarticular location.

3. Joint distension : Once the intra-articular location of the needle has been conformed the joint is distended with irrigating fluid. Normally up to 10-15 ml. of fluid can be instilled into the joint.

Resistance to injection of fluid into the joint after first 1-2 ml of fluid has been injected can be due to,

- (a) Needle tip is outside the capsule.
- (b) Massive intra-articular adhesions.

4. Skin incision : A 3-4mm skin incision is made only through the skin. Cutting the subcutaneous tissue and the capsule should be avoided.

5. Spreading the subcutaneous tissue : Once the skin is incised ,the subcutaneous tissues are spread with the help of a mosquito clamp. The capsule is not perforated with the mosquito.

6. Inserting the sheath : The sheath with the blunt obturator is inserted with gentle twisting motion. Once the capsule is perforated there is a sensation of giving way and the irrigation fluid will back flow through the open spigot. This confirms the intraarticular location of the sheath. The obturator is replaced by the Scope.

Placement of the Anterolateral Portal

The instrument portal, like the arthroscopy portal is created in series of steps.

1. Transillumination : The medial part of joint and the probable location of the anteromedial portal is transilluminated.

2. Determining portal location : The portal site is identified by inserting a needle percutaneously at the level of joint line, this needle is viewed arthroscopically.

3. Skin incision and spreading the subcutaneous tissues. same as in arthroscopy portal placement.

Examination Sequence

The ankle joint for practical purposes is divided into anterior and posterior spaces, each of which is subdivided into three compartments.

(A) Anterior Joint Space

1. Anterior compartment.
2. Anterolateral compartment.
3. Anteromedial compartment.

(B) Posterior Joint Space

1. Posterior compartment
2. Posterolateral compartment.
3. Posteromedial compartment.

In more than 90% of ankle arthroscopies, surgery is confined to the anterior joint space.

Complications

Varying complication rates have been described in literature. Complications can be,

1. Intra-operative local complications.

2. Post-operative local complications
3. Distraction related complications.

1. Intra-operative Local Complications

- (a) Vascular injury.
- (b) Nerve injury.
- (c) Cartilage damage.
- (d) Portal placement problems.
- (e) Ligament and tendon injuries

2. Post-operative Local Complications

- (a) Synovial fistula.
- (b) Haemarthrosis.
- (c) Infection.
- (d) Compartment syndrome.
- (e) Reflex sympathetic dystrophy.

3. Distraction Related Complications

- (a) Pin site infection.
- (b) Traction injury to tendons, nerves, ligaments and vessels.
- (c) Stress fracture.

References

1. Manual of arthroscopy surgery. By Michael Strobel springer.
2. Ankle anatomy for the arthroscopist Part 1 The portals. Pau Golano MD et all Foot and ankle clinics. June 2006 Volume 11 Number 2.

* * *