

Wrist arthroscopy

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Abstract

As with many joints, wrist arthroscopy is evolving from a technique introduced to help diagnose chronic pain to a therapeutic tool with an ever-increasing number of indications. This article describes the basic anatomy and technique of wrist arthroscopy, before giving an overview of the various interventional techniques that have developed to deal with wrist pathology. The surgeon should expect that there is a learning curve and, as with all surgical procedures, there is a risk of complications of which both patient and surgeon should be aware.

Keywords arthroscopy; complications; portals; therapeutic interventions; wrist joint

Introduction

Wrist arthroscopy is currently the gold standard for the diagnosis of intra-articular pathology of the wrist, especially scapholunate ligament problems and triangular fibrocartilage complex (TFCC) pathologies. It is gaining popularity due to its minimally invasive nature, which lends itself to day case surgery, and low risk of associated complications.

It is indicated for the diagnosis of chronic wrist pain (>6 months), scapholunate dissociation injuries and to perform synovial biopsy for the diagnosis of monosynovitis (>6 months). It is increasingly indicated for therapeutic interventions and these include: TFCC repairs, resection of ganglia (dorsal as well as volar), distal radius fractures with intra-articular component, scaphoid fracture fixation, ligament repairs, loose body removal, debridement of chondral defects, carpal fusion procedures, radial styloidectomy and wafer resection of the ulna, synovectomy and the drainage of septic arthritis.

Surface anatomy

The dorsal portals are defined by their relationship to the extensor compartments of the wrist. The bony landmarks of the wrist are the radial styloid process, Lister's tubercle, ulnar head and styloid (see [Figure 1](#)).

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Portals for wrist arthroscopy

Dorsal portals

3–4 Portal: this portal lies between the third dorsal compartment, which houses the extensor pollicis longus (EPL) tendon, and the fourth dorsal compartment, which houses the extensor digitorum communis (EDC)/extensor indicis proprius (EIP) tendons. This portal is in line with the second web space. This is the most common viewing portal in wrist arthroscopy. The landmarks for this portal are Lister's tubercle, the distal end of the radius and the dorsal lunate. The portal is made about 1 cm distal to Lister's tubercle in the soft spot. It gives excellent views of the radiocarpal joint as well as TFCC anatomy (see [Figure 2](#)).

6R portal: this portal is radial to the extensor carpi ulnaris (ECU) tendon. It is created by an outside-in technique once the arthroscope has been introduced through a 3–4 portal. A needle is advanced distal to the ulnar head, remaining close to ECU. The needle should be angled 10° to prevent damage to triquetrum. This is facilitated by trans-illumination using the scope. This is mainly an instrument portal. It can be a viewing portal for the TFCC, ulnolunate, ulnotriquetral and lunotriquetral ligaments.

4–5 portal: this portal lies between EDC/EIP and extensor digiti minimi (EDM). It lies in line with ring metacarpal. This portal lies about 1 cm ulnar to the 3–4 portal and proximal, because of radial inclination. It is mainly an instrument portal but it gives good views of the TFCC.

1–2 portal: lies between abductor pollicis longus (APL)/extensor pollicis brevis (EPB) and extensor carpi radialis longus (ECRL)/extensor carpi radialis brevis (ECRB) radial to EPL.

This portal carries a significant risk of damage to the radial artery and the dorsal sensory branch of the superficial radial nerve.

6U portal: this portal lies ulnar to ECU tendon. It is mainly used as an inflow portal. The dorsal sensory branch of ulnar nerve is at risk during placement of this portal.

Midcarpal portals

Midcarpal radial portal: this portal lies on the radial side of middle finger metacarpal axis, proximal to the capitate, in a soft depression between the capitate and scaphoid. This portal allows assessment of the scaphoid distal pole, scapholunate articulation and the capitate.

Midcarpal ulnar portal: this portal lies 1 cm distal to the 4–5 portal and is in line with the ring finger metacarpal. It lies between the lunotriquetral articulation proximally and the capitolunate articulation distally. This portal allows visualization of the distal lunate, lunotriquetral and triquetrohamate articulations.

Volar portals

Volar radial portal: this portal is created by making a transverse incision in the proximal wrist crease over the flexor carpi radialis (FCR) tendon. The FCR sheath is opened and the tendon is retracted ulnarward. Entry is then made through the FCR sheath after passing a needle to confirm joint entry just as described for a dorsal entry

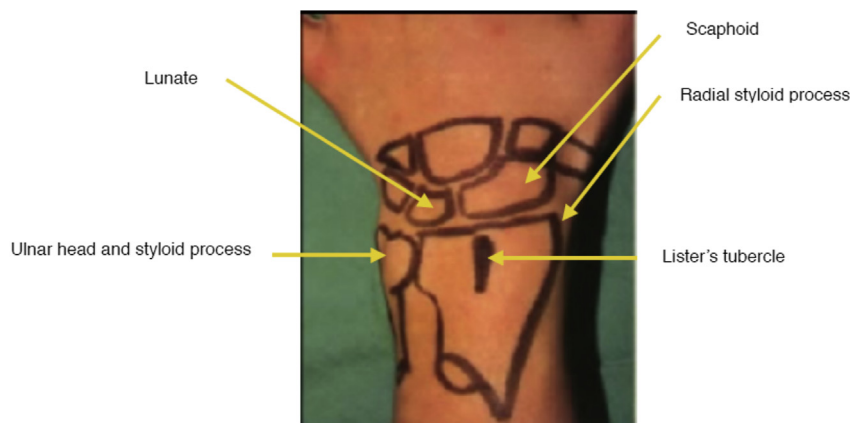


Figure 1 The bony landmarks of the wrist.

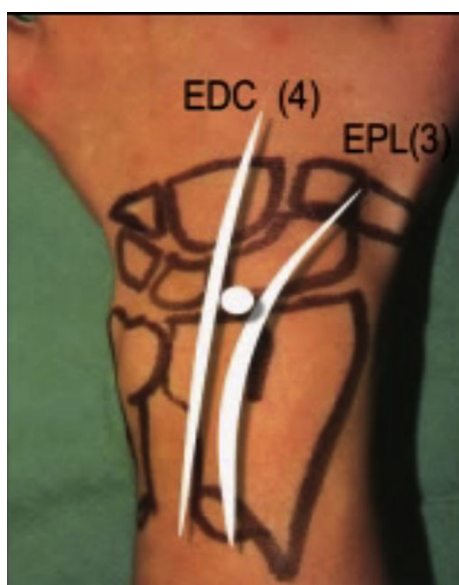


Figure 2 3–4 portal between extensor pollicis longus and extensor digitorum communis.

point. The radial volar portal is located just under the flexor carpi radialis tendon and the entry point is very close to the radial artery. It is a very good portal to evaluate radial side injuries to the wrist but it is difficult to visualize ulnar lesions through this portal.

Volar ulnar portal: this portal lies between ulnar neurovascular bundle and beneath the flexor tendons (flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP)). Radially are the flexor superficialis tendons and the flexor profundus tendons. The entry point is located, in the ulnar side of the wrist, very close to the ulnar neurovascular bundle.

Similar in its limitations to the radial volar portal, it is a very good portal for evaluation of ulnar sided injuries to the wrist but it is difficult to visualize radial lesions.

Volar central portal: the volar central portal has been described by Corella et al. It is created using an incision 1.5 cm long along the line of the third metacarpal, extending between the distal wrist crease and proximal wrist crease. After skin incision the FDS tendons are retracted radially and the FDP tendons are

exposed. The FDP tendons to the ring and little fingers are retracted ulnarward and the FDP to index and middle fingers are retracted radially to expose the volar capsule. The portal is created over the anterior horn of the lunate, through the space of Poirier under direct vision.

The advantage of this portal is that both the radiocarpal and mid-carpal joints can be accessed through a single incision.

Patient positioning and set-up

Anaesthesia

Wrist arthroscopy can be carried out under general anaesthesia or regional block anaesthesia. Some wrist surgeons favour local anaesthesia. The advantage of the latter is that it allows dynamic assessment of the pathology, as the patient is wide awake. This 'Wa Wa' technique avoids the risk of general anaesthesia and a tourniquet and is both cost-effective and relatively safe (see Figure 3).

Position

The patient lies supine on the table with the arm abducted 45–90° and, elbow flexed to 90°. The forearm is pronated and the surgeon faces the dorsum of wrist.

Tourniquet

An arm tourniquet is used with padding, set at a pressure of 250 mmHg.

Traction

Various traction techniques are described. The most common technique is suspension of the forearm using Chinese finger traps attached to the index and middle fingers with counter-traction applied to the arm by a suspended pulley. The weight required is usually 2 kg and ideally should not exceed 5 kg, to minimize the risk of traction injury. There are various devices available for providing traction. A traction tower facilitates the application of traction as well as the use of intraoperative fluoroscopy to assess the wrist pathology.

Technique

Examination under anaesthesia

Examination under anaesthesia is carried out before the arthroscopic surgery to reassess the wrist and confirm any instability, if present. This is usually assisted by C-arm fluoroscopy.

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