Clinical examination of the wrist

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Abstract

Accurate clinical assessment of the wrist can be difficult, due to the large number of structures that are found in a confined space, which give rise to a range of pathologies. It is therefore essential that clinicians develop a thorough and systematic technique of examination to elucidate the cause of the patient's wrist symptoms. This paper outlines key points for the clinical assessment of the symptomatic wrist. This is followed by an overview of the potential pathologies in each anatomical wrist zone, their typical symptoms and the pertinent examination findings the surgeon should seek to elicit. Thinking of the wrist as a series of five zones facilitates identification of the pathology. The described zones are radial–dorsal, radial–volar, ulnar–dorsal, ulnar–volar and central. Tips for the interpretation of each test are also included, along with an assessment of the sensitivity and specificity of relevant tests and its implications. Often, the better the clinical examination, the more productive the radiological examination.

Keywords carpus; clinical assessment; examination; wrist

Introduction

The wrist is a complex anatomical arrangement, with multiple interconnected structures in a relatively confined space. This can make identification of the pathology responsible for particular symptoms potentially difficult. It is necessary to adopt a systematic approach to examination in order to narrow the wide differential diagnosis. This requires a sound knowledge of not only wrist anatomy, but the potential pathologies and the provocative tests which help delineate them from each other.

This article will deal with general considerations concerning systematic examination of the wrist, then explore common causes of wrist symptoms and how to examine for them. The focus is on sub-acute and elective conditions in the adult.

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General history

A focused history will guide clinical examination. Ask about hand dominance, occupation, sporting level and previous injuries. There are four main symptoms that should be explored in some detail: 1. pain; 2. stiffness; 3. weakness; 4. clicking.

Pain is important and enquiry should be made about its site (radial, central or ulnar; dorsal or volar), onset (insidious, following trauma), character (dull ache, sharp on movement), radiation (forearm, hand), exacerbating factors (particular movements), relieving factors (rest, analgesia), and severity (preventing work or self-care). The location of the pain is a strong guide towards the diagnosis, and this helps focus the clinical examination. The most common site of pain for a variety of pathologies is detailed in Figure 1.

General examination

Positioning

The examination should be conducted with the examiner sitting directly opposite the patient (so the patient can be observed for signs of discomfort) with a table between upon which the patient can rest their elbow. This position facilitates comfort and allows forearm rotation to be controlled (Figure 2). Both hands, wrists and forearms need to be exposed to allow comparison with the contralateral side.

The examination should then follow the standard orthopaedic format of 'look, feel, move' followed by special/provocative tests.

Inspection (look)

Look at the hand and wrist, paying particular attention to skin condition, swellings, muscle atrophy and deformity. Specific signs to seek on inspection are listed in Box 1. Diagnoses such as rheumatoid arthritis should be obvious at this stage of the examination.

Palpation (feel)

Elicit tenderness, instability, crepitus, and clicking by palpation. Determine if masses are superficial or deep, fixed or mobile, hard or fluctuant. The different zones for palpation are considered later in this article in reference to each pathology and are summarised in Box 2. It is important to consider the dorsal and volar surface anatomy during palpation (Figure 3). Pulses of the radial and ulnar artery are palpated and sensation in the distribution of the median, ulnar, and superficial radial nerves is checked.

Range of motion (move)

The wrist has multiple points of articulation, which produce a variety of movements including flexion, extension, radial and ulnar deviation, pronation and supination which should be compared with the contralateral side (Figure 4).

Flexion and extension originate from the radiocarpal and midcarpal joints and loss of this motion suggests pathology in these joints. Supination and pronation occur at the distal radioulnar joint (DRUJ) and disease of this joint leads to decreased rotation. In addition to assessing movements in isolation, a useful measure of combined functional motion is the 'dart throwing motion' (Figure 5).

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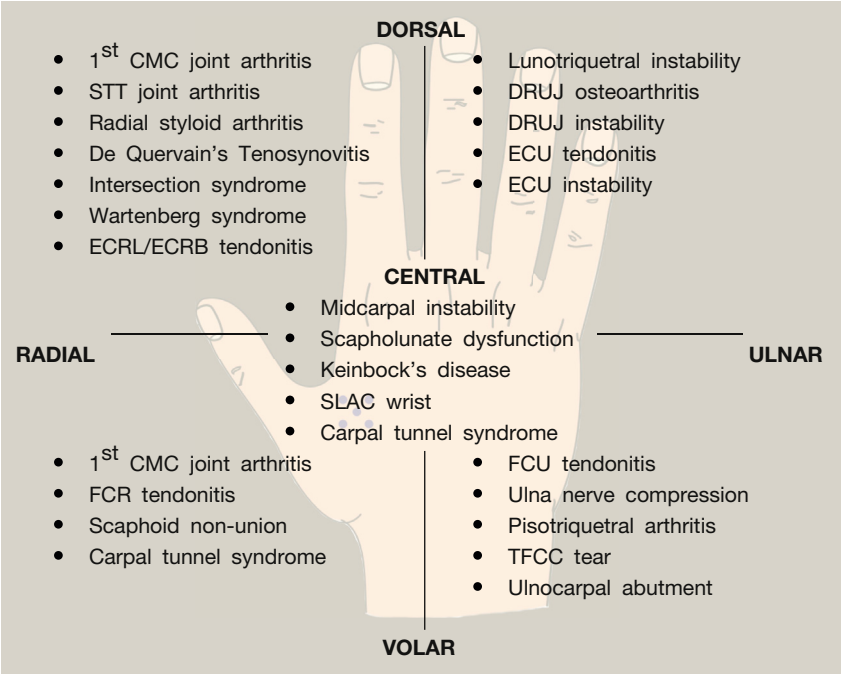

Figure 1 Wrist pathology listed by site of pain. CMC, carpometacarpal; DRUJ, distal radioulnar joint; ECRB, extensor carpi radialis brevis; ECRL, extensor carpi radialis longus; ECU, extensor carpi ulnaris; FCR, flexor carpi radialis; FCU, flexor carpi ulnaris; SLAC, scapholunate advanced collapse; STT, scaphotrapezial trapezoid; TFCC, triangular fibrocartilage complex.

Special tests

The numerous special tests for wrist pathology vary in their reported sensitivity and specificity. No single test is completely pathognomonic, hence several features must be interpreted in the clinical context of each individual patient to arrive at a diagnosis; a process of pattern recognition.

Whilst it is clearly evident clinicians should understand how to correctly perform these special tests is it equally important to have an understanding of the psychometric properties of each test. Sensitivity describes the ability of a test to correctly identify those patients with a particular condition. Conversely, specificity refers to the ability of a test to correctly identify those without the condition. A reminder about interpreting sensitivity and specificity is found in Box 3. A number of the tests relating to wrist pathology have either a limited sensitivity or specificity and it is clearly essential that we understand these limitations if the correct diagnosis is to be established.

Radial–dorsal symptoms

Thumb carpometacarpal joint osteoarthritis

Osteoarthritis of the first carpometacarpal (CMC) joint – often referred to as base of thumb arthritis – is a very common

Figure 2 Positioning for clinical examination of the wrist. The examiner sits opposite the patient with a small arm table between them.

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