

Hand and Wrist Pain in the Primary Care Setting

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Patients with hand or wrist pain commonly present to the primary care physician before seeing a specialist. The wrist consists of a complicated set of bones, soft tissues, and joints which can make the appreciation of the cause of pain a bit challenging. The key principle to reach an accurate diagnosis of the etiology of hand or wrist pain is following a systematic approach that is evidence-based; therefore, the main intention of this article is to provide the reader with an evidence-based approach to the patient presenting with hand or wrist pain.



Epidemiology of Hand and Wrist Pain

Studies show that up to 30 % of adults will have hand pain during their lives and half of the cases progress to chronic pain. The epidemiology of the specific injuries. Fractures of the phalanges and metacarpals are some of the most commonly encountered fractures and represent 10 % of all body fractures. Osteoarthritis is one of the most common causes of disability affecting 67 % of women and 54.7 % of men.

Occupational predisposition is seen in individuals who employ poor ergonomic practices such as repeated activities among athletes during intensive training sessions or typists who take poor ergonomic positions. Carpal tunnel syndrome mainly affects people aged

45—60 % with females being more common. Only 10 % are 31 years or younger. Ganglion cysts are more common in women and affect people aged 20—40 years.

The General Classification of the Causes of Hand and Wrist Pain

Generally, the causes of hand and wrist pain can be classified into mechanical, neurologic, and systemic. Psychosocial factors are also known to have an impact on the perception of pain. As we shall explain, many causes of wrist pain are related to occupational hazards; therefore, malingering and/or exaggeration of the pain are common findings in patients who are seeking workers' compensation from their employer.

Mechanical Causes of Hand and Wrist Pain

Fractures are a common cause of hand and wrist pain. Patients present with a history of recent trauma and point-tenderness over a certain bony structure. An x-ray of the hand or the wrist might be normal at first. Delayed radiography is usually more helpful as it can show callus formation. If in doubt and an early diagnosis is needed, a computed tomography scan, a magnetic resonance imaging study or a bone scan can be performed. These tests are helpful in the identification of the fracture line in the small bones of the hand.

Patients with a history of scaphoid bone fracture can present with pain due to nonunion. Radiography is helpful in the confirmation of the diagnosis. A scaphoid view should be performed for the adequate visualization of the scaphoid bone.

Patients with a history of scaphoid bone fracture can also develop avascular necrosis of the scaphoid, known as Preiser's disease. The lunate can also undergo avascular necrosis which is called Kienbock's disease. Magnetic resonance imaging studies are helpful in confirming the diagnosis.

Ligamentous tears which can happen due to a mechanical injury, trauma, or inflammation, can also present with hand and wrist pain. Magnetic resonance imaging studies are helpful in confirming the diagnosis. De Quervain's tenosynovitis is characterized by pain over the radial aspect of the distal radius. Ultrasonography can reveal synovial thickening. The presence of a ganglion can also present with wrist pain. Ultrasonography can be used to visualize the mass.

Neurologic Causes of Hand and Wrist Pain

Nerve entrapment, inflammation, or thickening of the surrounding sheaths of the nerves are also associated with hand and wrist pain syndromes. A common example is carpal tunnel syndrome which involves the carpal tunnel fibrous sheaths. Thickening of this structure is observed in a number of conditions such as hypothyroidism. Because the median nerve passes through this tunnel, it can get compressed if the tunnel is narrowed. This results in pain in the distribution of the median nerve and is known as carpal tunnel syndrome.

Specific injuries to the ulnar or radial nerve can also result in hand deformities and hand or wrist pain. Thoracic outlet compression syndrome is also associated with hand and

wrist pain.

The systemic causes of hand pain include amyloidosis, granulomatous diseases, leukemia, multiple myeloma, metabolic diseases, osteomyelitis, peripheral neuropathy, regional pain syndrome, and rheumatologic disorders. The cause of pain in each etiology is different. For instance, the cause of pain in osteomyelitis is related to the bacterial or fungal infection of the bone. On the other hand, multiple myeloma can result in hand pain because of the lytic changes that happen in the bones as part of the disease. These changes are associated with an increased risk of pathologic fractures. Peripheral neuropathy can be seen in patients with diabetes mellitus. Inflammatory disorders, such as rheumatoid arthritis, involve the synovial sheaths covering the tendons and the joints. Inflammation of the synovium is responsible for the pain that the patient might complain of.

Systemic Causes of Hand and Wrist Pain

Raynaud's phenomenon

A disease characterized with an extreme response to cold where the minute vessels contract leading to limited blood flow and tingling sensation with pain in the distal edges of the fingers.

Heart attack

The pain characterizing heart attack can be referred to the left heart due to the similar embryonic origin of the two myotomes.

Autoimmune conditions

Rheumatoid arthritis and **lupus** are autoimmune conditions that result from an imbalance that causes the body to produce antibodies that attack the joint tissues such as the synovial capsules.

History Taking from Patients with Hand and Wrist Pain

History taking is a learned skill. In up to 70% of the cases, the cause of hand or wrist pain can be reliably determined from history alone; therefore, the primary care physician should learn how to use this readily available tool to reach an accurate diagnosis.

One should inquire about the nature of the pain, its severity, timing, radiation, and exacerbating or relieving factors. Many causes of hand or wrist pain are associated with point-tenderness; therefore, the patient should be asked to point to the area of maximum pain which can help in narrowing down the differential diagnoses.

Inquiring about the history of traumatic injury is essential in all patients with hand or wrist pain. Even if the history of trauma is remote, it can still be relevant. For instance, a history of a previous scaphoid fracture can be elicited in patients who are presenting with avascular necrosis of the scaphoid. The patient's age can also give a clue about the most likely diagnosis of hand or wrist pain. Middle-aged women, for instance, are more likely to have an inflammatory cause behind their hand pain.

Tendinopathies usually present as pain over the bony insertion of a muscle. Extensor tendon rupture is a common finding in patients with rheumatoid arthritis.

Finally, one should inquire about past medical and medication history. Taking certain drugs, such as vincristine, can lead to peripheral neuropathy. A history of diabetes mellitus is also suggestive of neuropathic pain. On the other hand, a patient presenting with symptoms suggestive of carpal tunnel syndrome perhaps should undergo a diagnostic workup to exclude hypothyroidism.

Physical Examination of the Patient Presenting with Hand or Wrist Pain

Patients with hand or wrist pain should undergo a complete neurologic and cardiovascular examination. The patency of the peripheral circulation should be checked. The neck and the entirety of the upper limbs should be examined. One should look for erythema, swelling, masses, muscle atrophy, contractures, and tenderness. Non-specific tenderness is more common after acute wrist injuries. On the other hand, point-tenderness is usually suggestive of a subacute process that resulted in an injury to a certain structure in the hand or wrist. There are some specific tests that can be done to differentiate between the different causes of hand and wrist pain which are summarized in the following table:

Test	Indication	Technique
Finkelstein's test	Differentiation between de Quervain's tenosynovitis and arthritis of the first metacarpal	Instruct the patient to deviate the wrist to the ulnar aspect while grasping the thumb. Pain over the radial styloid is suggestive of tenosynovitis
Grind test	This test is used to confirm arthritis or wrist joint instability.	Compress and rotate the first metacarpal bone along the trapezium Compress and rotate the distal radioulnar joint If you feel crepitus and the patient complains of pain, this is confirmatory of arthritis.
Lunotriquetral shear test	Useful in confirming the diagnosis of a lunotriquetral ligament tear	Apply dorsal force on the triquetrum and palmar force on the lunate If you observe a painful click, the likelihood of a lunotriquetral ligamentous tear is high.

Special maneuvers can also be used to demonstrate certain findings or diagnosis :

- Hoffmann sign is characterized by a tingling sensation on tapping the median nerve at the carpal tunnel region. Positive in carpal tunnel syndrome.
- Phalen sign dictates that in a positive test flexion or extension of the wrist for 60 seconds elicits tingling.
- Finkelstein sign: on bending the thumb across the palm of the hand over the fingers and finally to the little finger, pain is elicited.
- Kenavel sign: positive in tenosynovitis wherewith the involved finger in slight flexion a fusiform swelling is seen with tenderness along the flexor sheath and pain on passive digit extension.

Imaging Studies in Hand or Wrist Pain

Patients presenting with hand or wrist pain should undergo a radiography study. While radiography is usually negative in acute fractures, delayed radiographic images can confirm the diagnosis in retrospect. A posterior-anterior and a lateral x-ray view are indicated for the adequate examination of the wrist.

Computed tomography scans are also helpful in confirming the diagnosis of nonunion of a fracture, avascular necrosis, and acute fractures. Computed tomography scans are becoming available in most centers, are cheap, and are easy to interpret.

Magnetic resonance imaging studies are superior to other imaging modalities in the visualization of soft tissues such as ligaments and tendons and confirming the diagnosis of tenosynovitis or ligamentous tears.

Electromyography and nerve conduction studies may be needed in cases of pain of neural origin. It also demonstrates the dermatomal distribution of nerve function loss.

Blood workups such as complete blood count, autoimmune assays, renal and liver function tests are ordered in cases of systemic causes of hand and wrist pain as well as to obtain a baseline before initiation of patient management.

General principles of hand and wrist pain management

Done according to the RICE principle that entails :

- **Rest:**
 - This involves immobilization of the involved hand for days or hours to allow for scar tissue to form and unite the separated parts of a muscle or to avoid any further damage.
 - Immobilization involves the use of splints, braces, and casts over the wrist joint in its functional position.
 - A below elbow cast is mostly used.
- **Ice application**
 - Done by placing ice cubes between a piece of cloth and applying it for 20 minutes over the injured or painful area. The process is repeated every 40 minutes.
 - It works by inducing vasoconstriction and hypoxic injury and reduces the level of inflammation and smaller hematoma formation.
 - It also accelerates regeneration of cells.
- **Compression**
 - Done concurrently with the application of ice
 - It has been shown to reduce the amount of fluid or blood accumulated in edema and hematomas.
- **Elevate the limb**
 - Decreases the hydrostatic pressure hence the limb is less oedematous as compared to a limb in a lower level.

Other specific methods of management are done as per the cause of the pain. They include fixation of fractures and immunosuppressive therapy for autoimmune conditions.

References

[A Clinical Approach to Diagnosing Wrist Pain](#) via [aafp.org/](#)

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