

## Hypothenar Hammer Syndrome **Delores Jones**

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### Abstract

Technology within the medical field has grown, especially in the last few decades. Many diseases and medical conditions are easily diagnosed with the use of innovative machines and information technologies. There are greater storage capabilities and better computer applications that assist medical providers with understanding health findings to create more accurate diagnoses. There are several rare medical conditions that affect various people throughout the world. In many of these situations, the condition goes untreated because people don't have access to medical facilities with utilizes innovative technologies. However, as we are moving further into the twenty-second century, more medical facilities are investing in this new equipment and computer systems. Additionally, there are more health care facilities (traditional and nontraditional) that are popping up all over the world and in the United States. Rarer medical conditions are being recognized and correctly diagnosed. One example of a rare condition that often was incorrectly diagnosed in prior years that can be detected easier with medical technology of today is hypothenar hammer syndrome. Hypothenar hammer syndrome is a type of ischemia located within the fingers. The preceding paragraphs will review what this syndrome is, the radiology modalities utilized to diagnose it, and the treatment of this rare condition.

**Keywords:** Hypothenar hammer syndrome; Medical technology; Radiology modalities; Ischemia; Hand trauma

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### Introduction

Hypothenar hammer syndrome is an infrequent disorder of the arteries found within the hand. The arteries found within the finger have blood clots that cause blockages in the digital arteries. This condition is often caused due to repetitive injury to the palmar ulna. That is why this condition is called hammer syndrome from the repeated blows to the hand [1,2]. The repeated strikes of the hands result in the injury to the main arteries of the hand and arms (the radial and ulnar arteries). Hypothenar hammer syndrome results in hand ischemia and loss of oxygenated blood and nutrients. This condition is often misdiagnosed, however, due to the improvement of health technologies, many health care facilities are now able to detect this medical condition. Thus, it is important to obtain a thorough patient history. Many patients that have this syndrome are work within professions that have repeated exposure to hand trauma. Some professions that result in this syndrome are golfers, farmers, tennis players, mountain bikers, hockey players, weight lifters, and construction workers [3]. This article will discuss the symptoms and technologies utilized to detect hypothenar hammer syndrome.

### Discussion

Hypothenar hammer syndrome is not the most common disorder of the artery and veins but occurs in many people throughout the world. People that have jobs that require strenuous activities, those that play sports, and people who smoke are more susceptible to this medical conditions than others. Many doctor's offices and health facilities have patients that experience hand, finger, or wrist pain. Patient's that may have this condition may enter with those symptoms as well as other specific clinical findings that point to this specific medical condition [4,5].

### Hypothenar Hammer Syndrome Defined

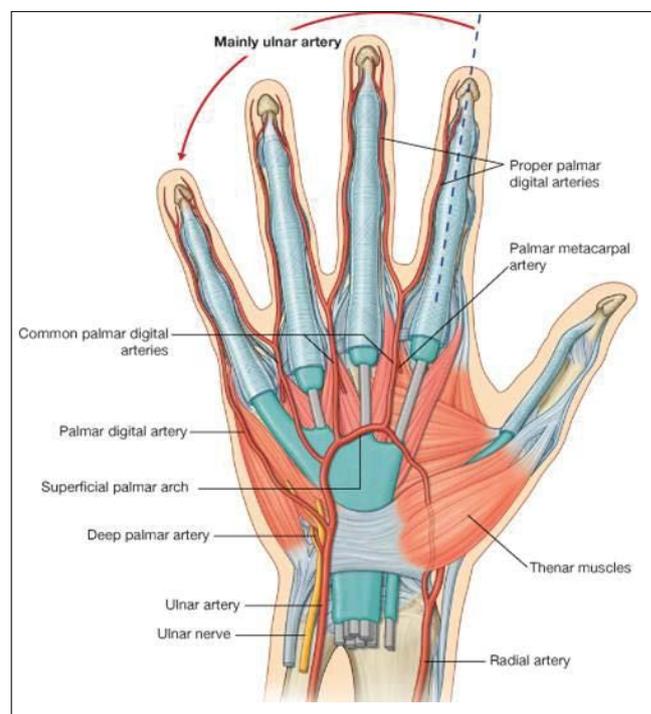
Hypothenar hammer syndrome is a health condition resulting from a deficiency of the blood flow within the hand. Hypothenar hammer syndrome is caused by trauma to the hand or caused by reoccurring compression, squeezing, or hammering of the hand. The injury to the blood vessels of the hand causes pain

and aching of the hand. Those that have hypothenar hammer syndrome presents with clinical findings such as cyanotic (blue) fingers, paresthesia, paralysis, cold intolerance to their hands, extreme sensitivity in fingers, and possible ulcers at the tips of the fingers [6]. All of these symptoms may occur more frequently in men that are around the age of 40. These symptoms can be the result of injuries that are obtainable from occupational jobs that require individuals to use tools that require them to squeeze or hit objects repetitively (such as with a hammer). Some occupations that require more use of the hands would be miners, bakers, carpenters, or automotive repair employees. Individuals that play sports such as karate, tennis, baseball, or sports that require repetitive hitting or squeezing are also more susceptible of obtaining hypothenar hammer syndrome [4]. **Figure 1** presents the anatomic appearance of arteries found within the hands that may become injured as a result of sports or occupation that may cause this syndrome. Additionally, trauma (such as injury directly to hand) can result in this medical condition. **Figure 2** presents the appearance of a person who has ischemia or loss of oxygen to parts of the hands or fingers due to blockages (or clots) within the arteries. The lack of blood flow is represented as a darkened or bluish discoloration of the digits in **Figure 2**.

## Diagnosis

There are several radiologic modalities that are now able to detect this rare health condition. Hypothenar hammer syndrome can be diagnosed with medical technologies such as angiography, computed tomography, magnetic resonance imaging, and ultrasound. Angiography is the number one (gold star) of radiologic modalities to detect this medical condition [4]. Angiography allows for a map of all internal vessels to be seen on the hand, wrist, and arm. Angiography illustrates if any arterial blockages (or clots) are seen on the hand. **Figure 3** shows an image obtained from angiography of an ulnar artery occlusion (total blockage of an artery) resulting in hypothenar hammer syndrome. The ulnar artery is pointed to by the white arrow within the image.

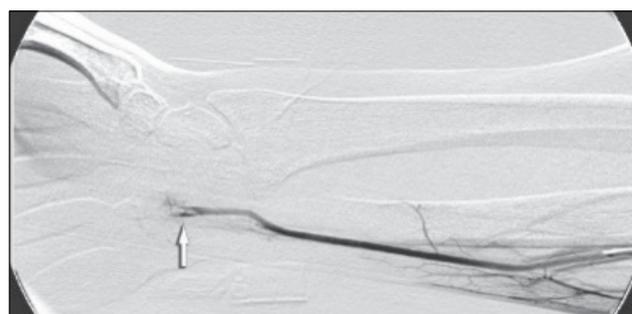
CT (computed tomography), ultrasound, and MRI (Magnetic Resonance Imaging) can also be used to diagnose Hypothenar hammer syndrome. All of these modalities are very sensitive to detecting arterial damage within the hand. Though these radiologic areas are not the gold standard for detecting hypothenar hammer syndrome, they provide alternative methods for assistance in diagnosing a patient so that they may get treated. If a medical facility doesn't have angiography available, one of these alternative modalities can be used to determine if a patient has hypothenar hammer syndrome correctly. Ultrasound modality is often selected to perform a noninvasive test on a patient because it is low cost and can quickly determine if there are clots within the arteries of the hand, wrist, and arm [7]. **Figure 4** illustrates the artery in a patient that has hypothenar hammer syndrome. The artery is seen in the ultrasound as having thickened walls which indicate there is a clot in the artery.



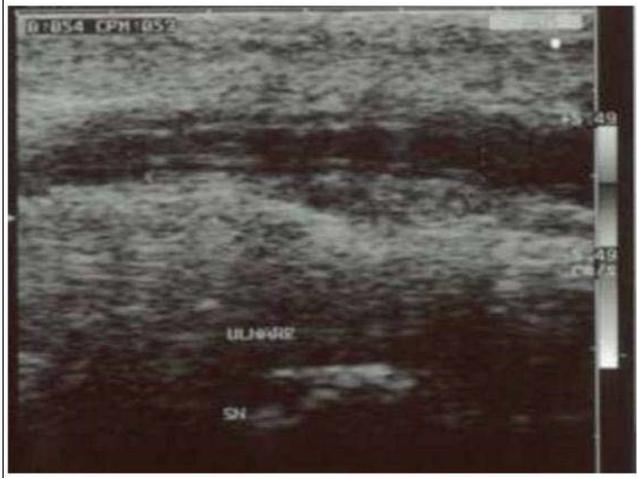
**Figure 1** The anatomic image of ulna arteries. This figure contains arteries seen within the hand that may become injured after repeated stress to the hands. Once the arteries of the hand are injured a patient may present with symptoms of hypothenar hammer syndrome [9].



**Figure 2** Hypothenar hammer syndrome fingers. This figure contains fingers of a woman that is experiencing ischemia of the digital arteries due to hypothenar hammer syndrome [10].



**Figure 3** Angiography of the hand and wrist. This figure illustrates (next to the white arrow) ulnar artery occlusion [4].



**Figure 4** The artery is visualized in this ultrasound image having thickened walls. The image is taken from a patient that has hypothenar hammer syndrome [6].

## Medical Treatment

Hypothenar hammer syndrome can be treated by surgery or a medicine regiment. The selection of the type of treatment is usually dependent upon how severe the patient's symptoms are. If a patient has ischemia and not adequate blood circulation, then surgery is more favorable for the patient's medical treatment. Surgery would be performed to unblock arteries or

to reconstruct arteries. However, if a patient has symptoms that are manageable, the treatment would be no surgical. Patients would be advised to changing jobs (so that any further damage to the hand would be prevented). Other nonsurgical medical treatments would include wearing gloves to avoid extremely cold temperatures, wearing thick gloves for a cushion to the hands, and medication (such as medicine that would help prevent further clots within the arteries of the hand). Additionally, if the patient smokes, it is suggested that they stop smoking to prevent further damage to the hands and wrists [8].

## Conclusion

Hypothenar hammer syndrome is an infrequent medical condition that can be hard to diagnose and derives from trauma or repeated stress to the upper extremity (hand or wrists). This syndrome is caused by damaged arteries within the hand or wrists that result in pain, ischemia, and several related clinical symptoms. However, if physicians and health professionals utilize various technologies such as CT, MRI, Angiography, and ultrasound patients can be quickly diagnosed so that they can be treated for their medical condition. Individuals that have hypothenar hammer syndrome presents with symptoms that are closely related to another medical condition called Raynaud's disease [7]. Medical professionals must thoroughly evaluate patients so that hypothenar hammer syndrome is not misdiagnosed with Raynaud's disease.

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