

## Rare case of brachial vein thrombosis of the upper extremity: A case report

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### Abstract

Deep vein thrombosis of the upper extremity is a very rare condition; the presentation of which is dependent on the degree of obstruction. Commonly, obstruction of the deep axillary and subclavian veins account for the majority of cases, however, the brachial veins may be involved. Typical symptoms include pain, swelling, and a sensation of heaviness in the upper extremity.

We present a case of a 72 year old osteoarthritic female patient with acute-on-chronic right hand pain and UE swelling in the absence of trauma. The patient's only risk factors for DVT include advanced age and Diabetes. Plain films were consistent with subchondral sclerosis significant for OA. A Peripheral Vascular Venous Study with Doppler Ultrasound of the right upper extremity demonstrated incompressibility of the right brachial vein. The patient was subsequently placed on anticoagulation therapy for the upper extremity DVT.

### Keywords

brachial vein; deep vein thrombosis; blood clot; anticoagulation; doppler Ultrasound; DVT

### Abbreviations

UE: Upper extremity; OA: Osteoarthritis; DVT: Deep vein thrombosis

### Introduction

Upper extremity deep vein thrombosis accounts for approximately 5-10 percent of all cases of DVT [1]. The deep veins of the upper extremity consist of the following: (1) radial and ulnar veins: those of which join together to form the brachial veins; (2) brachial veins: those of which join the superficial basilic vein to form the deep axillary vein; (3) axillary vein: which becomes the subclavian vein at the lateral margin of the first rib; (4) and subclavian vein: which joins the internal jugular to form the brachiocephalic vein. A thrombus may form in any of these deep veins of the upper extremity causing symptoms; those of

which may be mistaken for a musculoskeletal etiology.

Musculoskeletal complaints, such as hand pain or wrist pain, are common within an outpatient setting. Healthcare providers continuously find themselves relying on their ability to perform detailed physical exams in order to determine the most likely diagnosis. Providers may obtain plain radiographic films (X-Rays) in order to exclude fractures or identify soft tissue injury; which may indicate the need for advanced imaging such as a MRI.

When examining elderly patients with unilateral hand and wrist pain in the absence of trauma, threshold for a Duplex Ultrasound of the upper extremity may be low; with exception of acute unilateral swelling of the limb which is the most common symptom [5]. Most likely diagnoses include musculoskeletal (fractures, tendinopathy, radiculopathy), neurologic (nerve entrapment or neuropathy), or systemic (osteoarthritis or gout) etiologies. While an extensive laboratory workup can be performed to assess for inflammatory markers, such as ESR, CRP, and a CBC, it may take up to a day to receive “STAT” results in a clinic setting. Therefore, it is the job of the healthcare provider to perform a comprehensive physical examination and recognize any alarming signs that may indicate a dangerous condition. Unfortunately, even the finest clinical examination may be unreliable for a DVT.

## Case Presentation

MM is a 72 year old African American female who presented with acute-on-chronic right hand and wrist pain for the past 5 days. She did not recall any trauma, but was unsure. She reported a cramping and throbbing ache “over the top part of my hand and my entire wrist, but yesterday I noticed some swelling”; rating the pain a 7 out of 10 on a pain scale. Episodes of pain were intermittent throughout the day, lasting anywhere from 20 minutes to “hours”. She only noticed the episodes when “cleaning the house” or “exercising”, but “not when watching television”. Further questioning revealed she experienced these symptoms over a year ago, but attributed it to her osteoarthritis. When asked about pain elsewhere, she responded that “all of my joints hurt, my right shoulder has been bothering me a bit lately”.

MM has a past medical history of Osteoarthritis and Type 2 Diabetes. She is on combination medication for well-controlled Type 2 Diabetes, but no other medications. She has no surgical history. Family history includes paternal hypertension and social history consists of exercising 3 days per week and no alcohol or tobacco use. She denied any recent travel. She also denied headache, confusion, neck pain, changes in vision, dyspnea, chest pain, lightheadedness, weakness, numbness, or skin changes.

Vital signs were as follows: T: 98.6F, P: 76, BP: 118/62, RR: 12, O2: 98

Physical examination presented a thin, alert and oriented female in no acute distress. Her HEENT exam was within normal limits. Patient’s neck was supple with full range of motion without cervical lymphadenopathy. Cardiovascular exam revealed no evidence of JVD, no murmurs, regular rate and rhythm with a normal S1 and S2.

There was no evidence of cellulitis, erythema, or trophic changes of the right upper extremity. However, there were Heberden's nodes of the 2<sup>nd</sup> and 3<sup>rd</sup> distal interphalangeal joints, as well as significant swelling of the right hand extending to the mid forearm. There was no dilation of any collateral vessel in upper arm. The patient had limited active and passive range of motion of her right hand and wrist due to pain and mild crepitus. There was no bony point tenderness. Neurologic exam of the upper extremity was normal and pulses were 2+.

An X-Ray was performed in the office of the right hand and wrist to evaluate for a fracture given decreased range of motion of exam and possibility of trauma. Positive findings included joint space narrowing of the PIP joints with significant joint degeneration and subchondral sclerosis. There was no evidence of fracture and the findings did not explain the significant swelling. Therefore, the patient was scheduled for a Peripheral Vascular Venous Study with Doppler Ultrasound of the right upper extremity.

The ultrasound showed that the right brachial vein was not compressible. There were internal echoes noted within the brachial vein which was without internal venous flow; concerning for an occlusive thrombus. The internal jugular, subclavian, and axillary veins were within normal limits.

The patient was diagnosed with a Brachial Vein Thrombosis (DVT) of the right upper extremity. She was initially managed in the emergency room with anticoagulants (subcutaneous LMWH) and then subsequently outpatient with Apixaban 5mg PO BID.

## Discussion & Conclusion

A deep vein thrombosis of the upper extremity can be very challenging to diagnose. The majority of upper extremity DVTs are related to a traumatic event, such as lifting a heavy object and experiencing swelling and pain. However, our patient did not have many risk factors for an upper extremity venous thromboembolism. Further, she had no central line in place; she had no pacemaker or defibrillator; and she had no history of cancer. In the case of MM, it is easy for a provider to attribute her hand pain to her long-standing osteoarthritis; especially in the absence of trauma. However, the take away from this report is the following: if the provider is concerned about unusual swelling of the upper extremity, it may be beneficial to consider taking a closer look at the deep vasculature. If suspected, compression ultrasonography is noninvasive and frequently ordered, yielding accurate results. DVT's of the UE may be associated with pulmonary emboli, however, the reported risk is approximately 1-13%; that of which is considered variable and considerably lower when compared to DVTs of the lower extremities [4].

Treatment modalities for a DVT of the UE include anticoagulation therapy, catheter-directed thrombolysis, surgical decompression, and percutaneous angioplasty with stenting [3]. Guidelines for the treatment of a brachial vein thrombosis are similar to that of a DVT of the lower extremity. The American College of Cardiology suggests initial treatment for a DVT should consist of the following: Apixaban 10mg PO twice per day for 7 days, followed by 5mg twice per day; and those with an isolated idiopathic DVT should receive at least 3-6 months of anticoagulation therapy [6]. Anticoagulation therapy may be prolonged if either the patient has a history of cancer or if the thromboembolism is considered to be idiopathic and not

related to a secondary cause (pregnancy, oral contraceptive use, or surgery). A second ultrasound may be performed after 3-6 months before cessation of anticoagulation therapy. An ultrasound was performed on MM after 6 months which revealed the complete resolution of the upper extremity DVT.

It is important that providers recognize the signs and symptoms of an upper extremity DVT and remain on high alert if patient has persistent swelling of the upper extremity. There is currently no consensus as to the efficacy of prophylactic measures in preventing upper extremity DVTs; specifically those of the brachial vein. It would be beneficial to explore this in more detail in a future study.

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