Trauma to Thrombus: A Case Report of Internal Jugular Vein Thrombosis

Abstract
Internal jugular vein (IJV) thrombosis is associated with several etiologies. Trauma is a rarely recorded causative factor. This case presents one such example of how trauma causes IJV thrombosis. A middle-aged woman presented to the general medicine outpatient department with complaints of pain in the base of the left side of the neck and swelling of the left arm and neck for six days. The symptoms had occurred following a trivial trauma to the left side of the neck due to pressure from a 25 L water can. Before the patient came to our hospital, she went to a local clinic, where magnetic resonance imaging was done and showed findings suspicious of thrombosis in her left IJV with extension into adjacent veins. A venous Doppler confirmed the findings. The patient was then treated conservatively with low-molecular-weight heparin, muscle relaxants, and antibiotics. Although uncommon, vascular injuries should also be thought of following minor trauma and not just musculoskeletal events. This case report proposes that IJV thrombosis can also occur without the classical etiological factors.

Keywords: Deep-vein thrombosis, internal jugular vein thrombosis, trauma, upper limb

Introduction
This case report presents a unique opportunity to discuss the pathophysiology of thrombus formation and segues into discussions of etiologies for internal jugular vein (IJV) thrombosis. Virchow’s triad for thrombus formation includes endothelial injury, stasis of blood flow, and hypercoagulable states. It is possible that endothelial injury in the local vessels and stasis due to lifting a heavy water can could have caused the thrombus formation. IJV thrombosis is usually caused by central venous catheters, intravenous (IV) drug abuse, malignancies, and ovarian hyperstimulation syndrome. Common causes of IJV thrombosis are direct trauma to the vein due to catheterization or IV drug abuse.[1] Trivial trauma such as lifting a water can seems unlikely to cause a deep-vein thrombosis (DVT), yet the imaging findings for this patient suggested otherwise.

Case Report
A 34-year-old woman presented to the general medicine outpatient department with complaints of pain in the left side of the neck and swelling of the left arm and neck for six days. She injured herself six days ago while carrying a 25-liter water can over her left shoulder. The pain was acute in onset and gradually progressive. It radiated to the left axilla. The pain is aggravated on movements and relieved on rest. The patient complained of a swelling over the left upper limb and neck, which was large and diffuse. There was no diurnal variation, aggravating, or relieving factors for the swelling. There was no bluish discoloration of the limb, hoarseness of voice, or altered sensation of the limbs. The patient has no comorbidities or history of any substance abuse. On examination, pallor and regional edema over the left arm and neck were present. Vitals were stable. There were no alterations in the pulse rhythm and character between the right and left limbs. There was no radioralial or radiofemoral delay. Local examination showed an ill-defined, nonpulsatile swelling over the left side of the neck. There was reddish and blackish discoloration present locally. Tenderness and local rise of temperature were present over the swelling. There was no breast lump or axillary lymphadenopathy detected on examination. She was moderately built and nourished. She was not cachectic. Before she came to our hospital, the patient visited a local clinic where she got a chest X-ray and magnetic resonance imaging was done and showed findings suspicious of thrombosis in her left IJV with extension into adjacent veins. A venous Doppler confirmed the findings. The patient was then treated conservatively with low-molecular-weight heparin, muscle relaxants, and antibiotics. Although uncommon, vascular injuries should also be thought of following minor trauma and not just musculoskeletal events. This case report proposes that IJV thrombosis can also occur without the classical etiological factors.
imaging (MRI) done. The chest X-ray was normal. The MRI showed a focal intraluminal filling defect seen in the middle third of the left IJV (suspicious of thrombosis). This was seen extending down into the left subclavian vein and visualized proximal axillary vein with subcutaneous ill-defined soft-tissue stranding. Figure 1 shows the lesion on MRI.

A venous Doppler of the left upper limb confirmed a venous thrombosis of the left internal jugular and subclavian veins. Mild subcutaneous edema involving the anterior aspect of the left shoulder was also noted. Baseline investigations were normal. The prothrombin time, international normalized ratio, mean normal prothrombin time, and partial thromboplastin time were normal. An oncology consultation was taken to determine if the thrombus had a neoplastic origin. As the history and clinical examination of the patient did not fit this possibility, a malignant thrombus was ruled out. A coagulation profile could not be sent as the patient was immediately started on low-molecular-weight heparin. The pallor was most likely due to iron-deficiency anemia as the peripheral smear showed microcytic hypochromic cells. No other diagnosis was considered as the history and examination correlated with the radiological impressions.

The patient was managed conservatively by anticoagulants (low-molecular-weight heparin) and muscle relaxants/anti-inflammatory agents. The patient was also given antibiotics to treat any underlying cellulitis. After beginning treatment, the swelling and pain subsided, and the patient was subsequently discharged.

**Discussion**

Head-and-neck thrombosis has an incidence of <5% when compared to other types of thrombosis. IJV thrombosis is commonly associated with trauma such as central vein catheterization and seldom can be attributed to pressure caused by an external force. As the condition is often associated with malignancy, the oncology department assessed the patient. It was determined that her thrombosis was not related to cancer since this was an atypical presentation. IJV thrombosis associated with malignancy is usually spontaneous. There were not any significant details suggestive of that etiology in this case. A possible limitation to the following report was the lack of exploration into occult malignancy detection. The patient could have had head-and-neck cancer. However, the possibility of this is unlikely due to the previously stated lack of significant clues suggestive of malignancy. Tumor markers were not sent for the same reason. It has been recorded that pressure and trauma can dislodge a thrombus leading to a pulmonary embolism. However, it has been rarely recorded that pressure can lead to thrombus formation itself. Upper limb DVT is managed similar to a lower limb DVT. Enoxaparin 60 mg was given to the patient. After discharge, the patient still had complaints of pain that were only reducible by taking anti-inflammatory agents/muscle relaxants. This could be attributed to the incomplete resolution of the thrombus. The patient will require anticoagulants to be administered at maintenance doses for several months to relieve the symptoms completely. Although unlikely in this case, further surveillance to detect occult malignancies such as lung cancer and lymphoma may be required. Subsequent follow-up will be performed to assure complications such as pulmonary embolism and recurrence of the thrombus will not occur.

**Conclusion**

Here, we presented a rare case of IJV thrombosis following minor trauma. Providing importance to history and imaging findings can provide a clearer picture of the diagnosis. Because the onset and lack of history did not favor a malignant thrombus, credence to occult tumors was not given, and hence, time and money investigating malignancy was not wasted. IJV thrombosis can be managed similarly to this case, using anticoagulants, antibiotics, and muscle relaxants. The management should coincide with what the patient reports.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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**Figure 1**: Magnetic resonance imaging showing filling defect in the left internal jugular vein
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