

Emergency ultrasound diagnosis of internal jugular vein thrombosis

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Abstract

Introduction A 37-year-old male with lymphoma presented with acute neck pain and swelling. While the examination, lab work, and radiography were non-diagnostic, a bedside ultrasound revealed large internal jugular vein thrombosis as the cause of the patient's symptoms.

Materials and methods This is a case report and brief review of the literature.

Conclusion Prompt diagnosis of internal jugular vein thrombosis is critical. This case illustrates the value of bedside ultrasound in the early diagnosis of internal jugular vein thrombosis in a patient with an initially non-diagnostic workup.

Keywords Emergency · Ultrasound · Internal jugular vein thrombosis · Upper extremity deep vein thrombosis · Neck swelling

Case report

A 37-year-old male with Hodgkin's lymphoma and HIV on chemotherapy presented to the emergency department (ED) with 2 days of right-sided neck swelling and pain. The patient also complained of subjective fevers, chills, productive cough, vomiting, diarrhea, and epigastric abdominal pain. Vital signs were normal. On examination, his right anterolateral neck was slightly enlarged and moderately tender. A chest radiograph and routine lab work were unremarkable.

A focused bedside ultrasound of the right neck was performed by the emergency physician using a 10-MHz linear-array transducer (GE LOGIQe, GE Healthcare, Waukesha, WI), which revealed isolated right internal jugular vein thrombosis (IJVT), extending cephalad to the mandibular angle, and caudally to near the junction with the right brachiocephalic vein (Fig. 1; Videos 1–3). The patient denied chest pain, shortness of breath, and was not tachycardic or hypoxemic. He was admitted on a heparin infusion and was discharged 24 h later without complication on daily subcutaneous dalteparin.

Discussion

Internal jugular vein thrombosis is an uncommon entity in the general population though for obvious reasons expeditious diagnosis is crucial [1]. Previous studies of IJVT have occurred in outpatient, inpatient, and intensive care unit settings, and data for patients presenting to the ED with IJVT were lacking. Existing data show the most common risk factor for IJVT to be central venous catheter placement, followed by malignancy, either local or distant, as in the above-described case [2–4]. Less common risk

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Fig. 1 Transverse view of right neck. *IJ* right internal jugular vein with large hyperechoic focus representing thrombosis, *C* right carotid artery

factors include intravenous drug abuse, ovarian hyperstimulation syndrome, sepsis, multiple trauma, anatomic abnormalities, and iatrogenic neck trauma, including pacemaker placement and neck dissection [1, 2, 5].

In patients with IJVT who are symptomatic, the most common complaint is neck pain, associated with local swelling approximately 80% of the time [2, 4]. Other diagnoses to consider include cellulitis, neck space infections, and deep neck abscesses [5].

It is crucial to make the diagnosis of IJVT at the patient's first presentation as up to 36% of patients will have subsequent or concomitant pulmonary embolism (PE), and this diagnosis may be the first hint of an underlying malignancy [2, 4]. Isolated IJVT has been shown to have a 12-month mortality of 42% though death was related more to underlying illness than to IJVT or PE [3].

Venography, the gold standard for diagnosing deep vein thrombosis, is too invasive and impractical for routine use.

Bedside ultrasound, however, is rapid, non-invasive, and can readily determine with great accuracy whether IJVT is present. The sensitivity of compression ultrasonography for diagnosing IJVT is approximately 96%, approaching 100% if color flow Doppler is used, while specificity is 93% [4]. If IJVT is suspected, a linear-array transducer should be used to visualize the internal jugular, subclavian, and brachiocephalic veins. In this case, the thrombosis was obvious with a hyperechoic focus noted inside the internal jugular vein (Fig. 1, Videos 1–3) though in other patients a lack of vessel compressibility may be the only evidence of IJVT which is equally diagnostic [6]. If flow abnormalities alone are noted without a hyperechoic focus or lack of compressibility, further imaging is needed [6].

Conflict of interest None.

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