

# External jugular vein thrombosis secondary to deep tissue neck massage

Sneha Raju, HBSc,<sup>a,b</sup> and John Byrne, MB BCH, FRCSI, MD,<sup>b</sup> Toronto, Ontario, Canada

## ABSTRACT

An 85-year-old man presented with an acute asymptomatic lateral neck mass in the context of deep tissue neck massages during the past year. He was referred to vascular surgery after an ultrasound examination of the neck revealed a thrombus in the external jugular vein. His past medical history and comorbidities were noncontributory. A multidisciplinary team of vascular surgeons and hematologists did not recommend any anticoagulation, given that the patient did not have any risk factors for thrombosis as well as normal D-dimer levels. The patient was maintained on his previous dose of aspirin (81 mg daily). (J Vasc Surg Cases and Innovative Techniques 2017;3:146-8.)

Deep venous thrombosis of the upper extremity accounts for 4% to 10% of all venous thrombosis.<sup>1</sup> Most commonly, this includes the subclavian, axillary, and brachial veins.<sup>1,2</sup> Thrombosis of the external jugular (EJ) vein is a rare condition.<sup>1-3</sup> Previous reports have demonstrated that EJ vein thrombosis is associated with hypercoagulable states, such as malignant neoplasms; neck trauma, including catheterizations and fracture reductions; head and neck infections, such as Lemierre syndrome; and idiopathic causes.<sup>3-9</sup> Other risk factors include increased age, obesity, external compression, and associated illness.<sup>3,5,8</sup> Associated complications are postulated to include thromboembolic phenomena and clot propagation.<sup>9-11</sup>

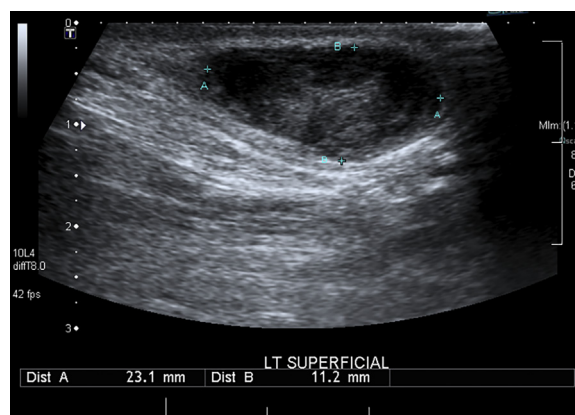
The rarity of EJ vein thrombosis and lack of guidelines surrounding treatment provide obvious challenges to the surgeon. We present a case of thrombosis of the EJ vein in a man with a history of deep tissue neck massage. The patient's consent was received for the purposes of this report.

## CASE REPORT

An 85-year-old man presented to the emergency department with a lateral neck swelling in the distribution of his EJ vein (Fig 1). He denied any other compressive or occlusive type of local or systemic symptoms. A prompt referral to vascular surgery was made after ultrasound examination of the neck



**Fig 1.** Left anterior neck triangle with 90-degree neck rotation to the right. There is a 2.3 × 1.1-cm soft, subcutaneous nonpulsatile mass at the base of the anterior triangle of the left side of the neck.



**Fig 2.** Ultrasound examination of the superficial left anterior neck triangle revealing a fusiform dilation of the external jugular (EJ) vein measuring 2.3 × 1.5 × 1.1 cm, with occlusion.

From the Faculty of Medicine, University of Toronto<sup>a</sup>; and the Division of Vascular Surgery, Peter Munk Cardiac Centre, Toronto General Hospital, University Health Network.<sup>b</sup>

Author conflict of interest: none.

Correspondence: John Byrne, MB BCH, FRCSI, MD, Assistant Professor, Division of Vascular Surgery, 200 Elizabeth St, 6EN-214, Toronto, Ontario M5G 2C4, Canada (e-mail: [john.byrne@uhn.ca](mailto:john.byrne@uhn.ca)).

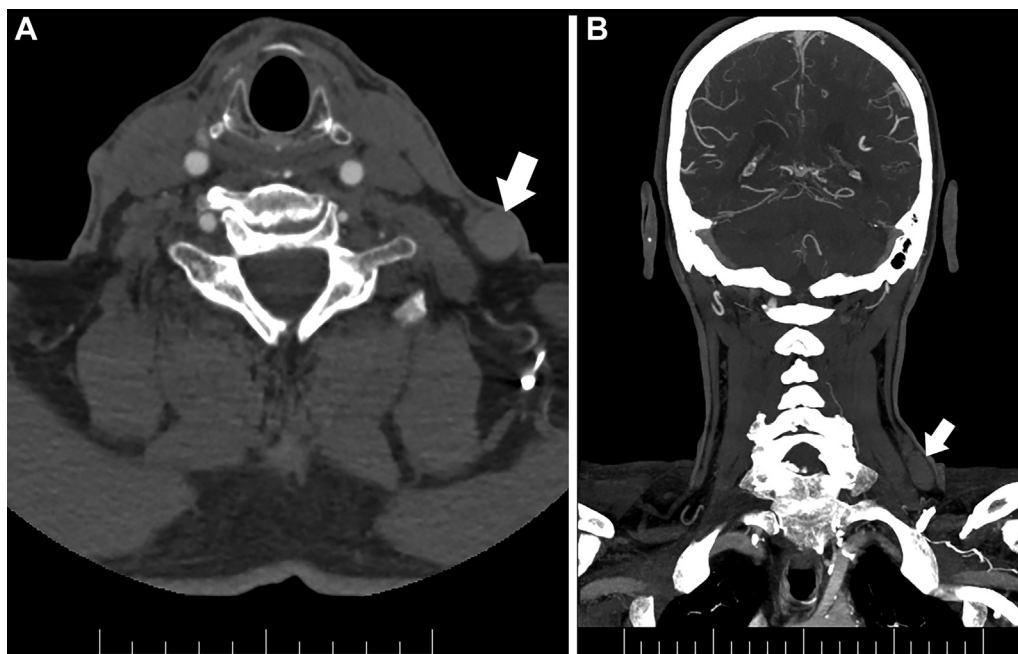
The editors and reviewers of this article have no relevant financial relationships to disclose per the Journal policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

2468-4287

© 2017 The Authors. Published by Elsevier Inc. on behalf of Society for Vascular Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<http://dx.doi.org/10.1016/j.jvscit.2017.05.002>

revealed a thrombus in the EJ vein (Fig 2). His past medical history was significant for hypertension, dyslipidemia, gout, and coronary artery disease requiring a previous bypass. In addition, he had previously undergone brachytherapy for prostate



**Fig 3.** Coronal (A) and axial (B) computed tomography angiograms demonstrating a 1.6 × 1.5-cm spherical mass contiguous with the external jugular (EJ) vein (white arrow).

carcinoma that was in remission. He denied any previous history of deep venous thrombosis or recent trauma to the area. The review of systems was otherwise unremarkable.

His social history revealed that he was a lifelong nonsmoker and consumed a moderate amount of alcohol. For the past year, he had also been getting deep tissue neck massages every 3 weeks for relaxation purposes. He perceived that his most recent massage before presentation was more vigorous than normal.

In the emergency department and subsequently in clinic, all vital signs were within normal limits. On palpation, there was a 2.3 × 1.1-cm soft, subcutaneous nonpulsatile mass at the base of the anterior triangle of the left side of the neck. It was freely mobile in the anteroposterior axis, with limited mobility in the craniocaudal plane. There was no surrounding erythema or edema. On examination, his upper limb pulses were normal. There were no dilated veins in the anterior aspect of the chest, shoulders, or neck or evidence of facial suffusion. On examination of the head and neck, there were no enlarged lymph nodes. Examination of the oral cavity was within normal limits.

Computed tomography findings demonstrated a 1.6 × 1.5-cm spherical mass contiguous with the EJ vein (Fig 3). Neck ultrasound examination revealed that his left EJ vein had a fusiform dilation measuring 2.3 × 1.5 × 1.1 cm with occlusion. The clinical and radiologic findings were consistent with a diagnosis of EJ vein phlebectasia. His laboratory investigations showed a hemoglobin level of 144 g/L, platelet count of  $133 \times 10^9/L$ , and creatinine concentration of 89  $\mu\text{mol/L}$ . His international normalized ratio, prothrombin time, and D-dimer level were within normal limits.

In the absence of any symptoms or associated health concerns, we concluded that the cause was local trauma due

to neck manipulation. Therefore, anticoagulation was not started, given that the patient additionally did not have any risk factors for thrombosis as well as normal D-dimer levels. The patient was maintained on his previous dose of aspirin (81 mg daily), without any further medical or surgical interventions, and suffered no further sequelae. The mass shrunk over time and was half its original size 3 months after diagnosis.

## DISCUSSION

EJ vein thrombosis is a rare complication of neck trauma. We presented the curious case of a man who noticed a lateral neck mass in the context of a 1-year history of regular neck massages. Although his only symptom was that of neck swelling, there have been previous reports in which patients have complained of pain and erythema.<sup>2,4</sup> We recommend neck ultrasound as the modality of choice as it has been previously shown to be superior to computed tomography and magnetic resonance imaging in diagnosis of vein thrombosis.<sup>11,12</sup>

There is no consensus on the treatment of EJ vein thrombosis. The decision to anticoagulate should be based on pre-existing risk factors and comorbidities. The treatment of EJ vein thrombosis is vastly different from that of internal jugular vein thrombosis. Due to the increased risk of potentially fatal thromboembolic events, patients with internal jugular vein thrombosis receive full therapeutic anticoagulation.<sup>13,14</sup> The risk of propagation and embolization in patients with EJ thrombosis is less clear, but further thrombosis is possible.<sup>9</sup> However, most instances of this occur within the first few days of onset.<sup>9</sup> In this case, we chose to manage the patient conservatively. Our decision to do

so was influenced by the absence of personal or family history of venous thromboembolism, the subacute nature of his presentation, and the normal D-dimer level as well as an overall mild burden of comorbidities. With >4 months of follow-up, there have been no further thrombotic events. Ultimately, it is crucial to discern the underlying cause of thrombosis and to seek advice, as necessary, from a variety of surgical and medical specialists. Other considerations include symptom control with nonsteroidal anti-inflammatory drugs or antibiotics.<sup>15,16</sup>

Surgical management of EJ vein thrombosis has been described, especially for cosmesis. There are several reports of resection in the pediatric population, especially in the context of phlebectasia and for symptomatic relief.<sup>2,17,18</sup> The decision should be made on the basis of the patient's preference, risks, and comorbidities.

## CONCLUSIONS

This report describes a rare complication of deep tissue neck massage. EJ vein thrombosis occurs secondary to malignant neoplasms, iatrogenic catheterizations, infections, and trauma. Most cases are manifested as an asymptomatic neck mass; however, there have been reports of neck and arm pain. Associated complications are postulated to include thromboembolic events and clot propagation. The decision to treat with anticoagulation vs symptom control should be based on consideration of personal risk factors, symptoms, biochemical markers such as D-dimer levels, and imaging.

## REFERENCES

- Munoz FJ, Mismetti P, Poggio R, Valle R, Barron M, Guil M, et al; RIETE Investigators. Clinical outcome of patients with upper extremity deep vein thrombosis: results from the RIETE registry. *Chest* 2008;133:133-43.
- Pucci RO, Economou SG, Southwick HW. Neck mass caused by thrombus in the external jugular vein. *Am J Surg* 1976;131:382-5.
- Colomina MJ, Godet C, Bago J, Pellise F, Puig O, Villanueva C. Isolated thrombosis of the external jugular vein. *Surg Laparosc Endosc Percutan Tech* 2000;10:264-7.
- Bartella A, Lubbers HT, Schuknecht, Gander T, Gratz KW, Kruse AI. Thrombosis of the external jugular vein. Case report

- of a rare cause of pain in the lateral neck. *Swiss Dent J* 2014;124:39-48.
- Kim EK, Lee SS. Internal jugular vein thrombosis after microvascular head and neck reconstruction in a hemodynamically unstable patient. *J Craniofac Surg* 2013;24:255-6.
- Safadi R, Gafanovich I, Rashkovsky I, Koplewitz B. Isolated external jugular vein thrombosis in older people. *J Am Geriatr Soc* 1996;44:885-6.
- Wiseman O, Preston PG, Clarke JM. Presentation of thyroid carcinoma as a thrombosed external jugular vein, with intraluminal tumour thrombosis in the great veins. *Eur J Surg Oncol* 2000;26:816-7.
- Hindi Z, Fadhel E. Idiopathic bilateral external jugular vein thrombosis. *Am J Case Rep* 2015;15:554-7.
- Gale M, Craxford S, Taylor L, Montgomery H, Pickering S. Thrombosis of the external jugular vein: a rare complication of a proximal humerus fracture treated with collar and cuff immobilization. *Case Rep Orthop* 2014;2014:283790.
- Ioannou CV, Kostas T, Tsetis D, Georgakarakos E, Gionis M, Katsamouris AN. External jugular vein aneurysm: a source of thrombotic complications. *Int Angiol* 2010;29:284-5.
- Zierler BK. Ultrasonography and diagnosis of venous thromboembolism. *Circulation* 2004;109:19-14.
- Garcia-Bolado A, Del Cura JL. CT venography vs ultrasound in the diagnosis of thromboembolic disease in patients with clinical suspicion of pulmonary embolism. *Emerg Radiol* 2007;14:403-9.
- Gbaguidi X, Janvresse A, Benichou J, Cailleux N, Levesque H, Marie I. Internal jugular vein thrombosis: outcome and risk factors. *Q J Med* 2011;104:209-19.
- Bandara AR, Wimalarathna H, Kalupahana R, Gunathilake SS. Internal jugular venous thrombosis due to Trousseau's syndrome as the presenting feature of metastatic prostate carcinoma: a case report. *J Med Case Rep* 2016;10:104.
- Tait C, Baglin H, Watson H, Laffan M, Makris M, Perry D, et al. Guidelines on the investigation and management of venous thrombosis at unusual sites. *Br J Haematol* 2012;159:28-38.
- Garrachon JM, Castaneira IA, Gaspar BE, Treceno JL. Thrombosed phlebectasia of the external jugular vein with neck pain. *Acta Otorrinolaringol Esp* 2012;63:399-401.
- Jianhong L, Xuewu J, Tingze H. Surgical treatment of jugular vein phlebectasia in children. *Am J Surg* 2006;191:286-90.
- Paleri V, Gopalakrishnan S. Jugular phlebectasia: theory of pathogenesis and review of literature. *Int J Pediatr Otorhinolaryngol* 2001;57:155-9.

Submitted Jan 11, 2017; accepted May 10, 2017.