

“Anatomical Variant of the External Jugular Vein: Case Report”

Researchers:

Khalid Musa Fadlelmula^{1*}, Mohammed A. Akeel, Ahlam Ahmed AL Harthy, Remaz Abdulaziz Al Hassan, Amal Mohammed Ageeli, Ghada Motaen Motawe, Raghad Mustafa Alnami, Ohood Essa Khormi¹

¹Department of Anatomy, Faculty of Medicine, Jazan University, Jazan, Saudi Arabia

Corresponding author: Khalid Musa



Abstract:

The external jugular vein (EJV) is formed by the posterior branch of the retromandibular and posterior auricular veins, which course down in the subcutaneous tissue of the sternocleidomastoid muscle (SCM) and pierce the investing layer of the deep cervical fascia to empty into the subclavian vein. Anatomical variations of the EJV have great clinical and anatomical significance, such as EJV cannulation, flap preparation, shunt site in the surgical treatment of hydrocephalus, and great auricular nerve identification. During the dissection of the anterior and posterior triangles of the neck for undergraduate students, a variant shape of the EJV was observed; the right EJV after its formation, the vessel was divided into two branches and then reunited before its termination in the subclavian vein, while the left vein was lowly formed on the SCM. Conclusion: The EJV has numerous topographical and morphological anatomical variations, and clinical practitioners should be aware of these variations during surgical intervention.

Word count: 1,036 words, excluding references.

Funding Statement: The study was supported by grant NN from the Foundation of Basic Research. This work was carried out under research program NNN of NN University.

Ethical Compliance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Keywords: Dissection, External jugular vein. Sternocleidomastoid muscle, Neck veins

Introduction:

The EJV is formed by the union of the posterior division of the retromandibular and posterior auricular veins and then courses down in the subcutaneous tissue over the sternocleidomastoid muscle. In the lower part of the posterior triangle, it pierces the investing layer of the deep cervical fascia to empty in the subclavian vein (Choudhry et al, 1997). The superficial cervical lymph nodes were located along the veins (Lengele et al, 2007). The anatomical variations of the EJV are well known and documented because of their great clinical significance, especially during neck surgery, flap preparations, and vein cannulation (Rusu et al, 2022).

The EJV may have variable topographical positions or morphological patterns. The termination of the EJV has been described in different anatomical textbooks. Thus, with subclavian vein drainage, other terminations have been described, such as the jugular-subclavian confluence and internal jugular vein (Deslaugiers et al, 1994).

The EJV varies in size and shape. The main diameter of the vein was 9.3 mm (Stickle et al. 1997). The EJV has four main tributaries (Deslaugiers et al, 1994): Anterior jugular, transverse cervical, suprascapular, and cephalic veins. The EJV has many anastomoses with the neck veins, such as the transverse anastomosis with the anterior jugular vein (Choudhry et al, 1997), and the facial vein may anastomose with the EJV as a transverse hyoid anastomosis.

The upper segment of the EJV is related to the great auricular nerve anatomically the vessel can be used to identify the nerve, (Murphy et al, 2012) as well the upper segment crosses the sternocleidomastoid muscle (SCM) obliquely. Then, it descends to the scalenus muscle before joining the subclavian vein. The superficial aspect of the EJV was entirely covered by the platysma muscle. (Aboudib et al, 1997), Superficial cervical lymph nodes lie along the vessel (Kadletz et al, 2022).

Case report

During the dissection skill development course for undergraduate students at the Faculty of Medicine, Jazan University. Dissection of the neck of a 73-year-old Asian descent male cadaver, with no deformity, musculoskeletal, or skin lesions.

Dissection of the EJV reveals a morphological variant of the vessel, which divides the vessel into two segments that descend parallel to each other, then reunite approximately 3 cm above the subclavian vein, and empties by a single stem in the subclavian vein. This observation was observed unilaterally on the left side [Fig. 1]. The right EJV is only one segment after its formation by the posterior division of the retromandibular and posterior auricular veins in a low position on the SCM, and then it descends to its termination in the subclavian vein. [fig-2]

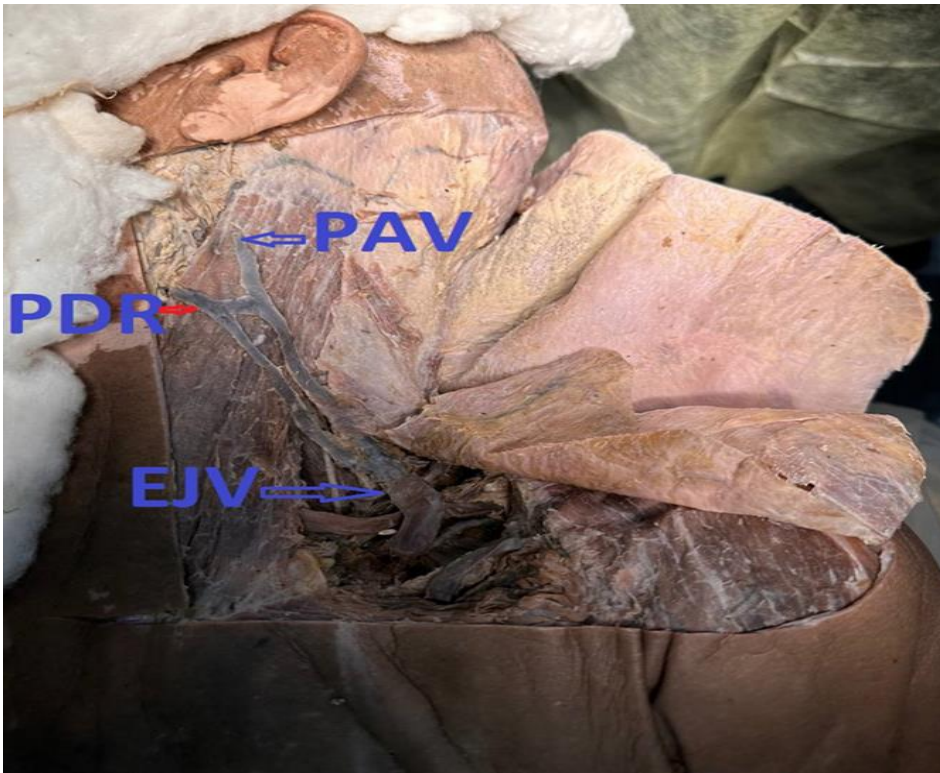


Figure 1. The photograph shows the fenestrated variant of the left EJV. (PAV: Posterior auricular vein, PDR: Posterior division of the retromandibular vein)



Figure 2. Low formation of the right EJV. (GAN: Great auricular nerve, PAV: Posterior auricular vein, SCM: sternocleidomastoid muscle. EJV: External jugular vein).

Discussion

The EJV may have various topographical variations in terms of its origin, course, and termination. The origin of the EJV is commonly found beneath the parotid gland, ear lobe, and behind the angle of the mandible (Moore & Dalley, 2018), It is formed by the posterior branches of the retromandibular and posterior auricular veins.

The term fenestration (window) indicates that the vessel is divided into two branches and then reunited before its termination, that is, one origin and one end. However, the term duplication indicates the bifurcation of the vessel without rejoining, which means that two separated vessels are formed with either one origin or end. (Thomas et al, 2008) In this case report, the EJV on the right side showed a fenestration pattern. (Snoj & Cvetco, 2013) reported two variants, a fenestration of the EJV followed distally by a true duplication, which means that two segments drain separately in the subclavian vein. (Olabu et al, 2015) reported two successive fenestrations of duplicated EJV. (Cvetko, 2013) reported a cervical branch of the facial nerve coursed through a fenestrated EJV and the transverse cervical and supraclavicular nerves coursed through fenestrations of EJVs reported by (Pillay et al, 2018). (Singh et al 2011), (Prigge et al. 2021), and (Ccorahua et al, 2022).

(Singh et al 2011), described a variant formation of the EJV by anterior and posterior divisions of the retromandibular vein descending from the parotid gland and facial vein, regarded as a fenestrated EJV. Double-fenestrated EJV was reported with proximal fenestration on the SCM and a distal supraclavicular fenestration (Paraskevas et al, 2014). (Vollala et al, 2008) reported a case of low EJV formation in consensus with the left EJV in this study.

Conclusion

The Knowledge of the morphological and topographical variations of the EJV is clinically significant, and the vein is used as a drainage site for shunt in the surgical treatment of hydrocephalus, central vein cannulation, parenteral nutrition, and AV fistula; therefore, further studies concerning the anatomical variations of the EJV may add important scientific data.

Abbreviations

EJV: External jugular vein

SCM: Sternocleidomastoid muscle

Conflict of interest: None.

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"الإختلاف التشريحي للوريد الودجي السطحي"

إعداد الباحثين:

خالد موسى فضل المولى، محمد عقيل، أحلام أحمد الحارثي، ريماز عبد العزيز الحسن، أمل محمد عجيلي، غادة مطاوع مطاوع،
رغد مصطفى النعمي، عهود عيسى خرمي.

الملخص:

يتكون الوريد الوداجي الخارجي (EJV) من الفرع الخلفي للأوردة خلف الفك السفلي والأوردة الأذنية الخلفية، والتي تتدفق إلى الأنسجة تحت الجلد للعضلة القصية الترقوية الخشائية (SCM) وتخرق الطبقة المستثمرة من اللفافة العنقية العميقة لتفرغ في العضلة تحت الترقوة. الوريد. تتمتع الاختلافات التشريحية في EJV بأهمية سريرية وتشريحية كبيرة، مثل إدخال القنية في EJV، وإعداد السديلة، وموقع التحويلة في العلاج الجراحي لاستسقاء الرأس، وتحديد العصب الأذني بشكل كبير. أثناء تشريح المثلاث الأمامية والخلفية للرقبة للطلاب الجامعيين، لوحظ شكل مختلف من EJV؛ EJV الأيمن بعد تكوينه، تم تقسيم الوعاء إلى فرعين ثم تم جمع شمله قبل انتهائه في الوريد تحت الترقوة، بينما تم تشكيل الوريد الأيسر بشكل منخفض على SCM. الاستنتاج: يحتوي EJV على العديد من الاختلافات التشريحية الطبوغرافية والمورفولوجية، ويجب أن يكون الممارسون السريريون على دراية بهذه الاختلافات أثناء التدخل الجراحي.

عدد الكلمات: 1,036 كلمة، باستثناء المراجع.

بيان التمويل: تم دعم الدراسة بمنحة NN من مؤسسة البحوث الأساسية. تم تنفيذ هذا العمل في إطار برنامج البحث NNN من جامعة NN.

الامتثال الأخلاقي: كانت جميع الإجراءات التي تم إجراؤها في الدراسات التي شملت مشاركين بشريين متوافقة مع المعايير الأخلاقية للجنة البحث المؤسسية و/أو الوطنية ومع إعلان هلسنكي لعام 1964 وتعديلاته اللاحقة أو المعايير الأخلاقية المماثلة.

الكلمات المفتاحية: تشريح، الوريد الوداجي الخارجي. العضلة القصية الترقوية الخشائية، أوردة الرقبة.