

Variation in termination of facial vein – a rare case report

Shilpa Bathla, Ritu Singroha, S.K. Srivastava

Department of Anatomy, Pt. B.D.Sharma Post Graduate Institute of Medical Sciences, Rohtak-124001, Haryana (India)

SUMMARY

Despite the fact that the blueprint of the whole body is unraveled, faultlessly during the growth and development of an animal; amazing variations do occur. During routine dissection of head and neck in our Department of Anatomy, an unusual drainage pattern of the facial vein on the left side of the face of a middle aged male cadaver was observed. The facial vein presented a normal course from its origin up to the base of mandible, and then it crossed the base of the mandible posterior to the facial artery. Thereafter, it bifurcated with one limb terminating into the anterior jugular vein and another into the external jugular vein. In addition to that, we also noticed a variation in the formation of the external jugular vein on the same side, which was formed by the anterior and posterior divisions of the retromandibular vein and the posterior auricular vein. Sound anatomic knowledge of the variations in the veins of the head and the neck is essential to the success of surgical procedures in this region.

Key words: Anatomical variation – Facial vein – External jugular vein – Retromandibular vein – Posterior auricular vein

INTRODUCTION

Deviation from the normal pattern in the vascular system is a common feature, and it is more common in the veins than in the arteries (Hollinshead, 1982). The complex embryological development of the vascular system often results in a myriad of clinically relevant anatomical variations and anomalies. Usually, the facial vein begins at the medial angle of the eye as the angular vein, by the union of the supra-trochlear and the supra-orbital veins. The superficial temporal vein unites with the maxillary vein to form the retromandibular vein. The retromandibular vein divides into the anterior and the posterior divisions within the substance of the parotid gland. The anterior division joins with the facial vein to form the common facial vein and it drains into the internal jugular vein. The posterior division, after union with the posterior auricular vein, continues as the external jugular vein which drains into the subclavian vein (Standring, 2006).

Knowledge of the variations of the superficial veins of the head and neck is important to surgeons as these veins may be used as patches for carotid endarterectomy and for oral reconstruction surgeries, where facial vein is often needed for microvascular anastomosis

(Sabharwal and Mukerjee, 1998). The external jugular vein is increasingly being utilized for cannulation to conduct diagnostic procedures or intravenous therapies (Gupta et al., 2003). The external jugular vein is easier to visualize than the internal jugular vein and may give a reliable estimate of central venous pressure. Permanent catheterization for haemodialysis via is a simple procedure without any severe complications (Skandalos et al., 2005). In addition, the retromandibular vein is used as a guide to expose the facial nerve branches in superficial parotidectomy and in open reduc-

tion of mandibular condylar fractures (Kawakami et al., 1994). The vein and its tributaries have to be identified and ligated during surgeries to prevent excessive bleeding.

Variation in the drainage pattern of the veins of the neck and face has been reported earlier (Choudhry et al., 1997; Kopuz et al., 1995; Peuker et al., 2001). The present article reports the case of anatomical variation in the termination of the facial vein and the formation of the external jugular vein on the left side of a cadaver during dissection.

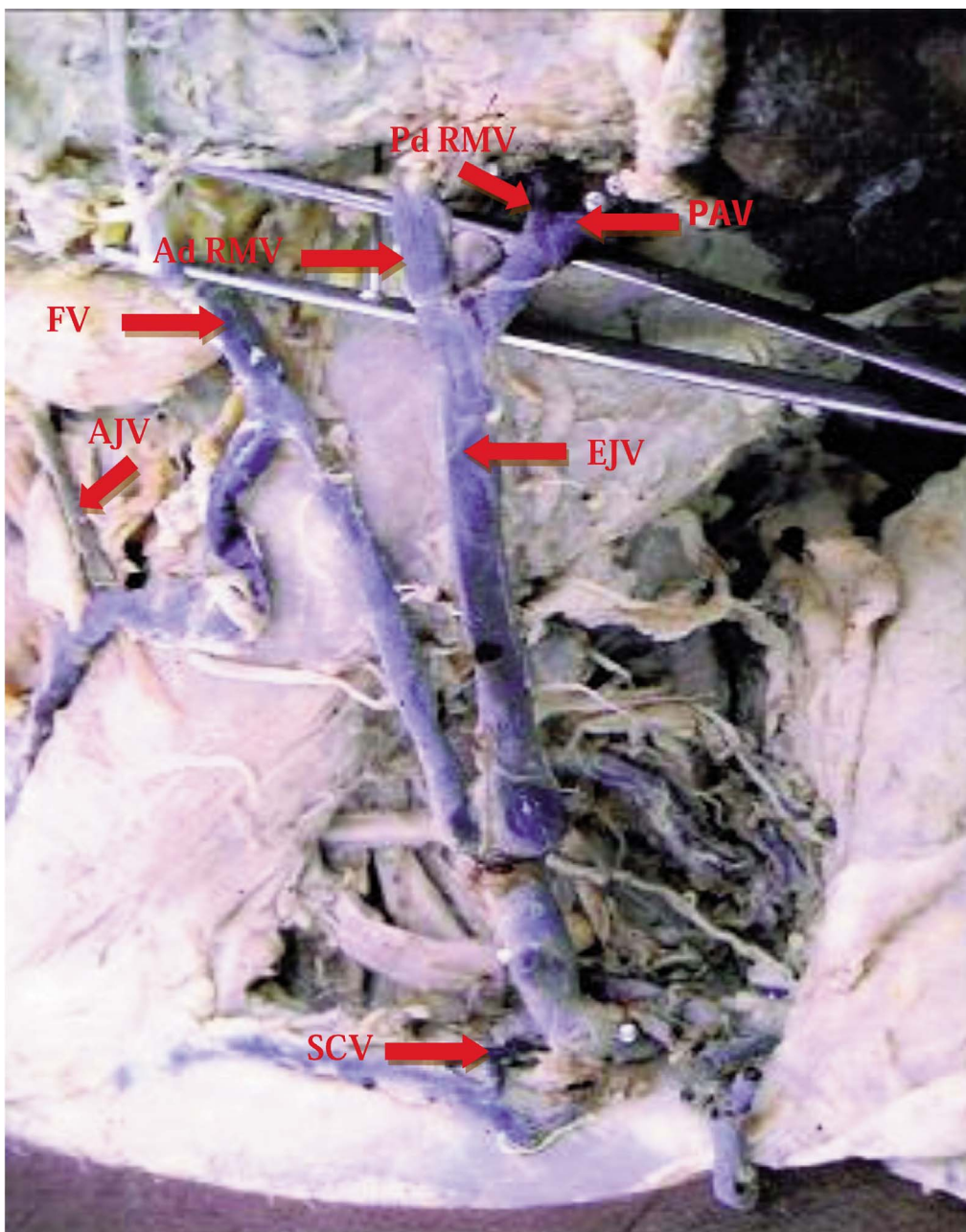


Figure 1. Dissection of the left side of the face and neck showing the facial vein and external jugular vein. FV: Facial vein, Ad RMV: Anterior division of retromandibular vein, Pd RMV: Posterior division of retromandibular vein, EJV: External jugular vein, PAV: Posterior auricular vein, AJV: Anterior jugular vein, SCV: Subclavian vein.

CASE REPORT

During routine dissection of head and neck for undergraduate students, a variation was noticed on the left side in a middle-aged male cadaver. The facial vein presented a normal course from its origin up to the base of mandible, and then it crossed the base of the mandible posterior to the facial artery. Thereafter, it bifurcated with one limb terminating into the anterior jugular vein and another into external jugular vein. The level of drainage of facial vein into the external jugular vein is just 4 cm. prior to the termination of external jugular vein into the subclavian vein. In addition to that, we also noticed a variation in the formation of the external jugular vein on the same side, which was formed by the anterior and posterior divisions of the retromandibular vein and the posterior auricular vein. The common facial vein was absent (Fig. 1). The venous drainage pattern on the right side of the face and neck was found to be normal. There were no other notable variations in the cadaver.

DISCUSSION

Deviations from the normal pattern in the venous system are quite common. Like most superficial veins, the external veins of the head and neck are subject to variations in their morphology, size and termination. The veins draining the regions of the head and neck establish their identity only after the development of the skull. The external jugular vein arises as a secondary channel from a capillary plexus derived from a tributary of cephalic vein, from the tissues of the neck and anastomoses secondarily with the facial vein (Standing, 2006).

In the present study, we noticed that the facial vein on the left side was terminated into the anterior jugular vein, as well as into the external jugular vein. The retromandibular vein divided into anterior and posterior divisions, which reunited and joined the posterior auricular vein to form the external jugular vein. In a study conducted on 89 dissected cadavers (178 sides) in the past, such termination of facial vein into the anterior jugular vein and the external jugular vein was observed in only 1 case, but the study did not comment on the formation of the external jugular vein (Gupta et al., 2003). Choudhary

et al. (2010) found an undivided retromandibular vein which continued as the external jugular vein with the facial vein draining into it. Although some cases of facial vein draining into the external jugular vein have been reported, no connection of the facial vein with the anterior jugular vein was noticed in any of these cases, and, moreover, the mode of formation of the external jugular vein was either normal or a continuation of the undivided retromandibular vein.

Pikkieff (1937), based on the study of 96 subjects, gave accurate numerical data concerning the frequency of variation in course and direction, branches and their anastomoses, of the subcutaneous veins of the neck. He found that vena *facialis anterior* drains into the anterior jugular vein in 15.1% cases and into the external jugular vein in 12% cases.

Deslaugiers et al. (1994) defined a certain number of notions concerning the afferent veins, the mode of termination and the valvular system of the external jugular vein. They found transverse cervical vein in 88% cases; the suprascapular vein in 47% cases; the anterior jugular vein in 46% cases and the cervical vein or anastomosis with the latter in 13% cases. In 60% cases, the external jugular vein drained into the jugulo-subclavian venous confluence; in 36% cases, into the subclavian vein at a distance from its junction with the internal jugular vein and in 4% cases into the trunk of the internal jugular vein.

The available literature does not depict such type of variation in which anterior and posterior divisions of the retromandibular vein joined the posterior auricular vein to form the external jugular vein. Moreover, the termination of the facial vein into both external jugular vein and anterior jugular vein makes it a rare special case. The variation of the external jugular vein and its tributaries are of great importance since this subcutaneous vein has many clinical applications in reconstructive microsurgeries and diagnostic procedures. Any malformation and variations of veins of the head and neck should be kept in mind preoperatively, as this helps surgeons to plan the operative procedures.

REFERENCES

- CHOUHRY R, TULI A, CHOUHRY S (1997) Facial vein terminating in the external jugular vein: An embryological interpretation. *Surg Radiol Anat*, 19: 73-77.

- CHOUDHARY S, SHARMA AK, SINGH H (2010) Undivided retromandibular vein continuing as external jugular vein with facial vein draining into it: an anatomical variation. *JK Science*, 12: 203-204.
- DESLAUGIERS B, VAYSSE PH, COMBES JM, GUITARD J, MOSCOVICI J, VISENTIN M, VARDON D, BECUE J (1994) Contribution to the study of the tributaries and the termination of the external jugular vein. *Surg Radiol Anat*, 16: 173-177.
- GUPTA V, TULI A, CHOUDHARY R, AGARWAL S, MANGAL A (2003) Facial vein draining into external jugular vein in humans: its variations, phylogenetic retention and clinical relevance. *Surg Radiol Anat*, 25: 38-41.
- HOLLINSHEAD WH (1982) The head and neck. In: *Anatomy for surgeons*. 3rd Ed., Jagerstown.
- KAWAKAMI S, TSUKADA S, TANIGUCHI W (1994) The superficial temporal and retromandibular veins as guides to expose the facial nerve branches. *Annals Plastic Surgery*, 32: 295-299.
- KOPUZ C, YAVUZ S, CUMHUR M, TETIK S, ILGI S (1995) An unusual coursing of the facial vein. *Kaibogaku Zasshi*, 70: 20-22.
- PEUKER ET, FISCHER G, FILLER TJ (2001) Facial vein terminating in the superficial temporal vein: a case report. *J Anat*, 198: 509-510.
- PIKKIEFF E (1937) On subcutaneous veins of the neck. *J Anat*, 72: 119-127.
- SABHARWAL P, MUKERJEE D (1998) Autogenous common facial vein or external jugular vein patch for carotid endarterectomy. *Cardiovascular Surgery*, 6: 594-597.
- SKANDALOS IK, AMVROSIADIAS DM, CHRISTODOULOU AC, EVANGELOU IN, DITSIAS FK, KARAMOSHOS KN (2005) Catheterization of external jugular vein for haemodialysis. *Khirurgila (Mosk)*, 11: 47-50.
- STANDRING S (2006) *Gray's Anatomy: The Anatomical Basis of Clinical Practice*. Edinburgh, London, pp 273-274.