ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 10, Issue, 12, pp.76094-76095, December, 2018

DOI: https://doi.org/10.24941/ijcr.33428.12.2018

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

RARE VARIATIONS IN FORMATION AND TERMINATION OF SUPERFICIAL VEINS OF THE NECK: A CLINICAL RELEVANT CASE REPORT

***Syed Rehan Hafiz Daimi**

College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

ARTICLE INFO

Article History:
Received 24th September, 2018
Received in revised form
16th October, 2018
Accepted 17th November, 2018
Published online 29th December, 2018

Key Words:

Retromandibular vein, External jugular vein, Facial vein and jugulosubclavian confluence.

ABSTRACT

Background: Exploring anatomical variations in human body is interminable. Slight variations are observed in the individuals especially in the veins. Knowledge of these variations is a need of modern days advance medical science to conduct innocuous procedures or to avoid needless complications. **Aims:** This is a case report of a 60 year old male cadaver having variations in the superficial veins of the neck. **Materials and methods:** During routine dissection on the male cadaver we noted deviation in normal morphology, formation and termination of superficial veins unilaterally on the left side. **Results:** The retromandibular vein continues downward as external jugular vein without dividing into anterior and posterior divisions. The facial vein instead of terminating into internal jugular vein joined external jugular vein. And the external Jugular vein besides terminating into the subclavian vein terminates at the jugulo-subclavian confluence. **Conclusion:** Presence of such variant course in the veins may cause difficulties in the invasive procedures. So it is advisable to have prior knowledge of these variations for safe conduction of procedures.

Citation: Syed Rehan Hafiz Daimi. **2018.** "Rare variations in formation and termination of superficial veins of the neck: a clinical relevant case report", *International Journal of Current Research*, 10, (12), 76094-76095.

INTRODUCTION

It is well-known fact that veins are variable than arteries. But variations in those veins which have been utilized for clinical procedures are worth to know for successful surgical procedures and to avoid serious complications of hematomas, arterial injury and pneumothorax. Superficial veins have been utilized for catheterization for various purposes including rapid infusion of blood products or fluid, parenteral nutrition or drug infusion, hemodialysis, central venous pressure monitoring, to obtain myocardial biopsy specimens in heart transplant and to create transjugular intrahepatic portosystemic shunt *(*Skolnick, 1994*)*. External jugular vein (EJV) is normally formed by the union of the posterior auricular vein and posterior division of the retromandibular vein (RMV). It starts at the level of mandible, just below the apex of the parotid gland and runs vertically down in the superficial fascia till a point just above the midpoint of clavicle. It pierces the deep fascia and opens into the subclavian vein (SV). Facial vein (FV) begins at the medial angle of the eye as the angular vein, and joins with anterior division of the retromandibular vein to form the common facial vein and it drains into the internal jugular vein (IJV) *(*Hollinshead, 1982*)*. Most commonly venous catheters are percutaneous inserted by utilizing various anatomical land marks and the procedure is success when the veins are in expected position, with its normal.

Corresponding author:* **Syed Rehan Hafiz Daimi,
College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia.

Even slight anatomical variations may cause difficulties or may leads to total failure of the clinical procedures[1].

Case report

We noted deviation in normal morphology, formation and termination of superficial veins of the neck. During routine dissection on the male cadaver of 60 years on the left side, we observed following variations (Figure 1, 2):

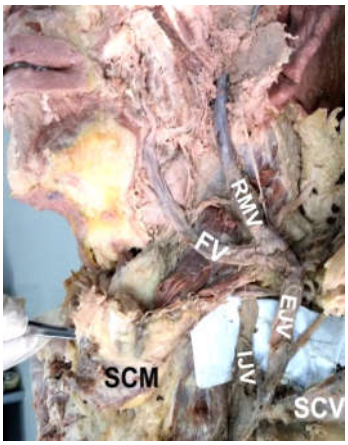

Figure 1. Dissection of left side of neck showing variations in the veins. RMV, Retromandibular Vein; FV, Facial vein; IJV, Internal Jugular Vein; EJV, external jugular vein; SCV, subclavian vein; BCV, brachiocephalic vein and SCM, sternocleidomastoid muscle

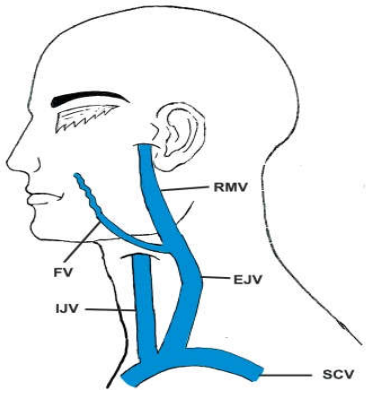

Figure 2. Schematic diagram showing veins pattern found in this case report. RMV Retromandibular Vein; FV, Facial vein; IJV, Internal Jugular Vein; EJV, external jugular vein and SCV, subclavian vein

- The retromandibular vein was undivided into anterior and posterior divisions and continues as EJV.
- The facial vein continued downward without receiving any tributary from RMV and joined with EJV instead of IJV in 'Y' shaped pattern at a distance of 53 mm from the angle of the mandible.
- Common facial vein is absent.
- The external jugular vein was straight continuation of RMV without receiving posterior auricular vein. The caliber of EJV was larger than IJV and terminated into the Jugulosubclavian confluence, instead of terminating into subclavian vein.

DISCUSSION

The external jugular veins are so variable that it is not possible to determine a "normal pattern" (Poynter) (http://www.anatomyatlases.org/AnatomicVariants/Cardiovascular/Text/Veins/JugularExternal.shtml). Literature is replied with the variations in formation and termination of EJV. Nayak, S. & Soumya, K.V reported a case of RMV did not divide and joined with facial vein to from external jugular vein (Nayak, 2008). Susmita ghosh *et al*. reported two cases of common trunk form by union of undivided RMV and facial vein which ultimately draining into SV (Ghosh *et al*., 2012). B Deslanges *et al*. studied 100 EJV and found that 60% of them drain into jugulo-subclavian confluence, 36% in subclavian vein and 4% in the internal jugular vein (Deslaugiers *et al*., 1994). Brown.S stated that drainage of EJV into jugulo-subclavian confluence as 4.5%, 56.4% in SV, 30.8% in internal jugular vein and 6.2 % in both internal jugular and the subclavian vein (Brown, 1941). In our case the mode of termination is in the jugulo-subclavian confluence. Chaudhary et.al concluded that, in 5% of cases FV drained into EJV at a distance of 55mm to 104 mm from the angle of the mandible. We measured this distance about 53mm in the present case (Choudhry *et al*., 1997). Gupta et.al reported the FV terminated in the EJV in 9% at a variable distance from angle of mandible. They observed different pattern of termination of FV into EJV and the most common is 'Y' shaped pattern found in 37.5% of cases. In our case, patter of termination is similar as 'Y' shaped as mentioned by Gupta *et al*. (2003). The development of the veins of the scalp, face and neck has not been clearly understood nor has been the cause of their variations. In the 40 mm embryo the EJV at its cranial end connected anteriorly to the FV and posteriorly to the RMV. The developing EJV thus annexes essentially the major tributaries of the CFV. In the normal course of development the entire anterior connection retrogresses and the posterior connection forms the posterior division of the RMV. The FV thus drains into the IJV via the CFV. However, if the anterior connection persists, it becomes the main drainage channel while on the other hand the terminal parts of the FV, RMV and the entire CFV retrogress. The posterior connection receives the posterior auricular vein (PAV) to form the EJV; thus the entire RMV becomes the other formative tributary in all such cases (Choudhry, 1997).

Conclusion

Although cases of undivided RMV, facial vein draining into external jugular vein have been reported but termination of EJV into jugulo-subclavian confluence along with undivided RMV and facial vein joining EJV which are collectively present in this case is unhitherto mentioned. Superficial veins of the neck especially external jugular vein are frequently used for cannulation for diagnostic and therapeutic procedures. Knowledge of these variations is important for surgeons to perform the reconstructive surgeries and to avoid any intraoperative error in procedures which might lead to unnecessary complications. In addition to, it may also be helpful for radiologists performing sonographic and angiographic studies. It is advisable to have ultrasound guided venipuncture to avoid complications in cases of variations in patterns of superficial veins.

Conflict of Interest statement: No any conflict of interest.

Funding statement: non funded

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