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Case Report

Venous variations in neck region: cephalic vein

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ABSTRACT

The cephalic vein lies in the deltopectoral groove, and passes throught the infraclavicular fossa, and drains into the axillary vein. It may communicate with the external jugular vein via a branch positioned anterior to the clavicle before emptying into the axillary vein. In this case multiple variations were found in the veins of the neck region: cephalic vein, jugular vein, and facial vein.

The cephalic vein in the left side passed between the clavicular and sternal heads of the pectoralis major muscle. The cephalic and the external jugular veins were joined and made a common trunk at the anterior border of clavicle. Then opened into the junction of the subclavian and internal jugular veins below the clavicle. The facial and retromandibular veins were built up the external jugular vein. The anterior jugular vein was absent.

Key words [cephalic vein] [external jugular vein] [facial vein] [cannulation]

Introduction

The cephalic vein, defined as the vein originating in the radial end of the dorsal venous arch, crosses superficial to the anatomical snuffbox and travels upward along the anterior border of the brachioradialis muscle in the forearm [1,2]. It ascends lateral to biceps and between pectoralis major and deltoid muscles, and passes through the infraclavicular fossa, and drains into the axillary vein. It may communicate with the external jugular vein via a branch positioned anterior to the clavicle before emptying into the axillary vein [1,3].

Most commonly central venous access is achieved at the bedside through the subclavian, femoral, brachiocephalic and cephalic veins [4]. The cephalic vein is suitable for central venous access, pacemaker and defibrillator implantation, and reported to have a lower incidence of complications than subclavian puncture [5]. Hence, the cephalic vein is clinically important. The correct anatomical knowledge of the cephalic vein is of critical importance when considering emergency procedures [6].

Many authors have reported the anatomical variations of the cephalic vein: absent or very thin, accessory cephalic vein, different course, and various terminations [6–10]. We found a variation of the cephalic vein and the structures nearby during routine dissection. In this case we described a variation of the cephalic vein, which was joined the external jugular vein.

Case Report

During a routine dissection, a variation of the anatomical presentation of veins was noted at the left shoulder region of 57-year-old Korean male cadaver. The anatomy of the vein on the right side was as usual. In this case, the perforating point of the cephalic vein located between the clavicular and sternal heads of the pectoralis major muscle, not at the infraclavicular fossa, which located normally between the deltoid and the pectoralis major muscles. The cephalic and the external jugular veins were joined to constitute a common trunk at the anterior border of clavicle and entered just below the clavicle and opened into the junction of the subclavian and internal jugular veins. The external jugular vein was consisted of the facial and the retromandibular veins and joined with the cephalic vein beneath the clavicle. The perforating point of the cephalic vein was located at 3.2 cm medially from the infraclavicular fossa and 5.8 cm from the jugular notch. The anterior jugular vein was not found in this case (Figure 1a). After the sternocleidomastoid muscle dissected, we confirmed that the cephalic vein was joined with the external jugular vein. The transverse cervical vein was drained into the posterior aspect of the junction between the cephalic and external jugular veins. Joined vein was terminated the junction of the subclavian and internal jugular veins (Figure 1b,c).

Discussion

Numerous authors have reported the variations in the course and the termination of the cephalic vein. The

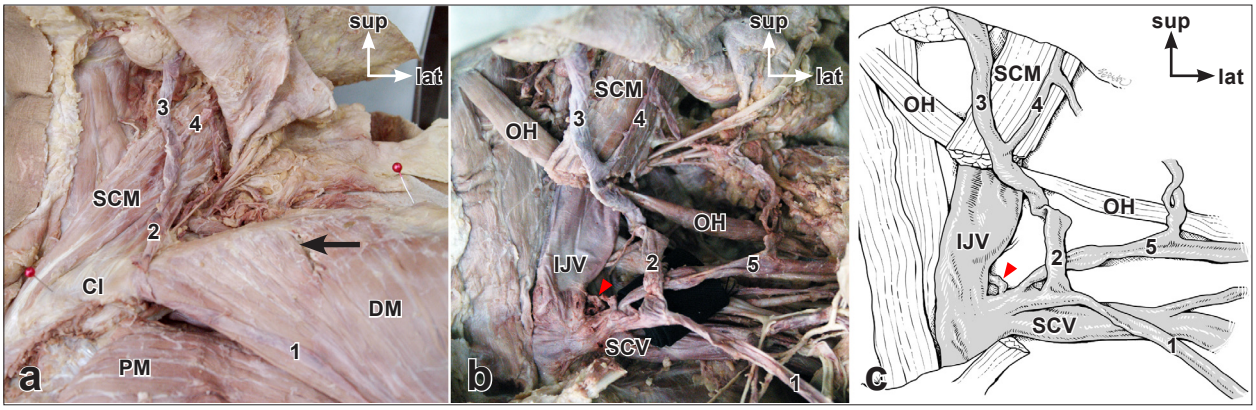

Figure 1. Pictures and drawing of variations in neck and shoulder region at left side. **a)** Superficial area of the neck and shoulder region; **b)** Deep area of the neck and shoulder region; **c)** Drawing of b. *(**SCM:** sternocleidomastoid muscle; **Cl:** clavicle; **PM:** pectoralis major muscle; **DM:** deltoid muscle; **OH:** omohyoid muscle; **IJV:** internal jugular vein; **SCV:** subclavican vein; **1:** cephalic vein; **2:** external jugular vein; **3:** facial vein; **4:** retromandibular vein; **5:** transverse cervical vein; **black arrow:** location of normal infraclavicular fossa; **red arrowhead:** thoracic duct)*

cephalic vein may terminate at the internal jugular vein, the external jugular vein, or the basilic vein [9–11]. Lau et al. reported the cephalic vein emptied into the subclavian vein via a supraclavicular course [12]. In our case, the cephalic vein drained into the junction of subclavian and internal jugular vein with an aberrant infraclavicular course. The facial vein drained into the external jugular vein, but rather it formed the external jugular vein with the retromandibular vein.

The proximal end of primitive cephalic vein curves around the superficial aspect of the clavicle and that joins the external jugular vein. The earlier drainage channel of the cephalic into the external jugular vein could be named 'jugulocephalic vein' from Evans, and Brook and Smith [13,14]. The facial vein in embryologic stage drains into the external jugular vein and that thus drains into the internal jugular vein via the common facial vein after Stage 7 [15]. Such as embryologic development is suggested the variations in this case might be caused no transition of the ventral pharyngeal vein.

The cephalic vein is suitable for the central venous access. The cephalic vein cut-down method has been found to correlate with a lower incidence of complications than subclavian vein puncture [5]. It is particularly well suited for the intravenous drug administration during the emergency procedures because the cephalic vein has a constant anatomical presentation and large size, thus facilitating easy cannulation [6,16]. In the external jugular vein, the drainage site is important for clinical applications. These are as follows: shunt for hydrocephalus, percutaneous central vein cannulation, maxillo-facial surgery, invasive monitoring, and external jugular venous by-pass, etc. [15].

In recent time, the clinicians prefer the cephalic cut-down method rather than subclavian or the internal jugular vein puncture [2]. These variations introduced intravenous line or catheter could move in the wrong direction and caused to puncture wrong area or structures on the pectoral area. Therefore, the knowledge of the anatomical variations would help to reduce the occurrence of the iatrogenic complications and prevent postoperative complications.

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