Partial Duplication of External Jugular Vein Forming a Venous Ring Around Supraclavicular Nerve: A Case Report

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ABSTRACT
External Jugular Vein (EJV) is an important superficial vein draining head & neck region. It usually lies singly on both sides of neck and drains to subclavian vein. Rarely it may be double on either side. In the present case, there was seen partial duplication of the right EJV in the form of a venous ring enclosing supraclavicular nerve. The vein bifurcated 1 cm below the nerve point and the branches rejoined with each other to form a venous ring. The ontogenic basis and clinical implications of the entity are discussed.

Key Words: External Jugular vein, Supraclavicular Nerve, Venous Ring

INTRODUCTION
Deviation from the normal pattern in the vascular system is a common feature and it is far commoner in the veins than in the arteries. The subcutaneous veins of the body including the EJV (External Juglar vein), may vary considerably in morphology, relative size, disposition, anastomosis, tributaries, valves and termination.

The external jugular vein, one of the main superficial veins of the head and neck, drains blood mostly from the scalp and the face. It is formed by the union of the posterior division of the retromandibular vein with the posterior auricular vein. It begins at the level of the angle of the mandible or in the parotid gland and runs down the neck towards the middle of the clavicle. It crosses the sternocleidomastoid muscle obliquely and in the subclavian triangle perforates the deep fascia. It crosses the transverse cervical nerve and its upper half runs parallel to the great auricular nerve which ascends behind it. It varies in size, occasionally being double [1]. The clinical importance of this vein lies in the fact that it is used as a venous manometer and for catheterization [2]. It is important medicolegally [3] and for surgeons who do head and neck surgery as they have to avoid it while executing a submandibular incision to expose the mandible [4]. It is also a preferred option in the head and neck free tissue transfer as the recipient vein [5].

MATERIAL AND METHODS
In the routine departmental dissections for undergraduate students, a rare anomaly of EJV was encountered in a 50 years old male cadaver, on the right side. The vein was meticulously dissected by the authors. The area was cleaned and photographed.

OBSERVATIONS
The external jugular vein on the right side was formed in the parotid gland and emerged from its apex. Thereafter, it crossed the SCM muscle obliquely, with the greater auricular nerve running parallel to and behind it. The vein descended to the nerve point where four nerves (greater auricular, lesser occipital, transverse cervical and supraclavicular) emerged and spread up for their respective destinations. One cm below this, the vein divided into two branches, one smaller medial and a larger lateral with the supraclavicular nerve passing in between the two. After another one cm, these two branches joined with each other to reform the EJV. Thus, a venous ring was formed which encircled the supraclavicular nerve. The anterior smaller segment of the ring also received a transverse jugular vein from the opposite sided EJV, which was normal in its course and termination. The supraclavicular nerve after passing through this venous ring of the EJV, divided into its three terminal branches i.e. medial, intermediate and lateral ones. (Table/Fig-1)

DISCUSSION
The superficial veins of the head and neck, especially the external jugular vein are increasingly being utilized for cannulation to conduct diagnostic procedures or intravenous therapies [4-6]. The inspection, auscultation and doppler sonographic examination of the jugular veins may give a clue for the diagnosis of cardiac diseases [2]. Ultrasound guided venipuncture is a viable possibility in cases of variations in the pattern of the superficial veins. So, their knowledge is important for surgeons who do reconstructive surgery [6], radiologists who do catheterization and clinicians in general [7]. The veins of the head and neck, particularly the EJV, is reported to depict numerous variations which affect its size, form, tributaries, drainage, course and termination [3,8,9,10,11]. However a venous ring formed around supraclavicular nerve could not be traced. Out of the four cases of anomalous facial vein & EJV reported by Choudhry et al [9] (1997), in one the EJV split into two channels on the external surface of the SCM muscle and reunited at its junction with facial vein. However, this ring formed did not give passage to the supraclavicular nerve as was found in the present case.

Another closely related entity, the duplication of EJV or the double EJV has been reported in 5.3% of dissections by Pikkieft [11], 1937. Other workers like Hollinshed [12] (1982) and Williams [1] et al (1998) have made a mention of this entity without narrating the incidence. However in their cases, the whole EJV was duplicated, while in the present case, only a small segment of it was duplicated in the form of a venous ring, which trapped the supraclavicular nerve in between.
The development of the veins of the scalp, face and neck has not been clearly understood nor has been the cause of their variations [3]. The principle cephalic vein which is formed early in the embryonic life disappears, thus necessitating the formation of venous spaces which connect and form channels, thus leading to the origin of the facial and pharyngeal veins [13]. Their enlargement at some places and diminution at others result in a retiform arrangement. Some primitive channels evolve and enlarge to form the definitive ones [14]. Two main venous channels have been observed in this region in an embryo with a length of 10 mm i.e. the primitive maxillary vein and the ventral pharyngeal vein which drain the anterior part of these spaces to retrogress, which usually should have disappeared so that a double EJV is left in a small segment which has also entrapped the supraclavicular nerve.

ONTOGENY

The development of the veins of the scalp, face and neck has not been clearly understood nor has been the cause of their variations [3]. The principle cephalic vein which is formed early in the embryonic life disappears, thus necessitating the formation of venous spaces which connect and form channels, thus leading to the origin of the facial and pharyngeal veins [13]. Their enlargement at some places and diminution at others result in a retiform arrangement. Some primitive channels evolve and enlarge to form the definitive ones [14]. Two main venous channels have been observed in this region in an embryo with a length of 10 mm i.e. the primitive maxillary vein and the ventral pharyngeal vein which drain the rapidly growing mandibular and the hyoid arches into the common cardinal vein [9]. Simultaneously, a small cranial tributary of the primitive cephalic vein in the arm at stage 6, has grown larger in the differentiating tissues of the neck and joins the juguloccephalic vein which is craniodorsal to the cartilaginous clavicle, which is now surrounded by a venous ring. The caudoclavicular part of this ring is a new anastomosis whereby the definitive cephalic vein overcomes its pharyngeal venous ring as it may compress the supraclavicular nerve, thus causing pain or hyperaesthesia in the area of its distribution. Moreover, an attempt to cannulate the vein in this region may injure the supraclavicular nerves. So, one must be familiar with such a variation.

REFERENCES

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