

# Usefulness of External Jugular Vein Puncture in an Emergency Situations

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## Abstract

We report a method for puncturing the external jugular vein when it is difficult to obtain venous access in the upper and lower extremities in emergency situations. External jugular vein puncture is a simple and safe procedure, which can easily be performed in an ambulatory setting in patients with very poor peripheral venous capital. This article reviews the procedure of external jugular vein puncture, its' possible complications and the advantages.

## Keywords

External Jugular Vein, Emergency Situations, Procedure of Vein Puncture

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## 1. Introduction

In the emergency department, we often encounter resuscitated patients with cardiopulmonary arrest (CPA) [1] and cases of shock in which a peripheral route is difficult to obtain.

We often puncture the external jugular vein with a 18G medkit. However, no published protocol is currently available. Therefore, this article reviews the procedure of external jugular vein puncture, its possible complications and the advantages.

## 2. Procedure

### 2.1. Topographic Anatomy

The external jugular vein is a superficial vein situated on the lateral portion of the neck. It is easily identified visually and runs obliquely from the angle of the mandible down to the middle of the clavicle. Its' diameter is roughly 5 - 10 mm, but varies widely from one side to the other, between individuals, and seems inversely

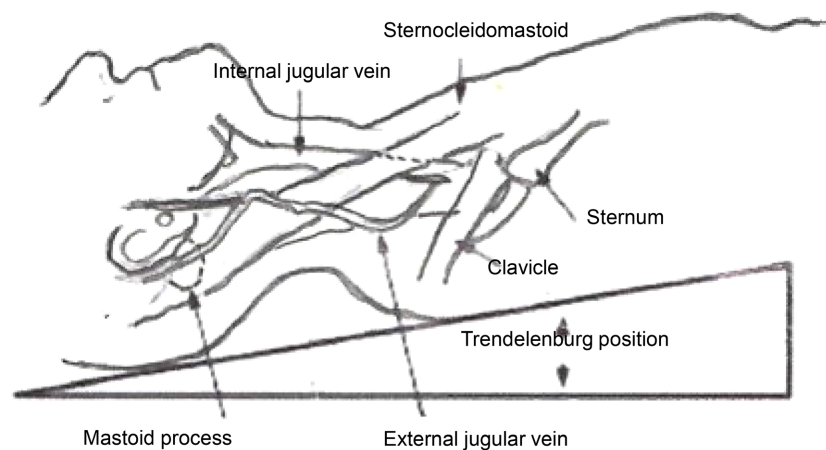
correlated to the diameter of the internal jugular vein on the ipsilateral side [2] as shown in **Figure 1**.

## 2.2. The Technique for Puncturing External Jugular Vein

In the mild Trendelenburg position [3], with the head slightly tilted to the opposite side of the EJV cannula insertion site. We observe the degree of distension and running condition of the left and right external jugular veins, and select the side that is easier to puncture.

As shown in **Figure 2**, when the external jugular vein is fixed with the index finger and thumb of the left hand, it is tensed. Furthermore, when the patient is forced by the Valsalva maneuver [4], the external jugular vein is further distended, as if peripheral veins had been tied with a tourniquet, making it easier for the operator to puncture. We puncture with a 18G medkit. The success of catheter insertion is confirmed by successful blood aspiration via the catheter.

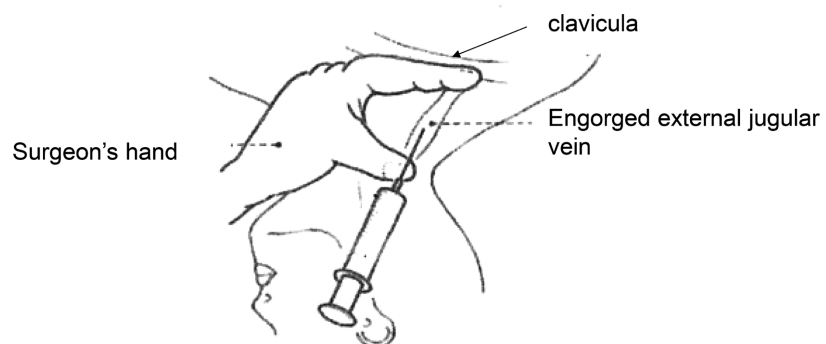
Therefore, EJV cannulation has been used in patients with difficult venous access.



From Castro E, Burdet CE (2017) Use of External Jugular Vein Puncture Technique in Ambulatory Setting for HCV or HIV/HCV Co-infected People Who Injected Drugs J HIV AIDS 3(2)

Source: <http://emedicine.Medscape.com/article/80317-overview#15>

**Figure 1.** External jugular vein is situated on the lateral portion of the neck.



**Figure 2.** Fixation of the external jugular vein.

### 3. Discussion

The external jugular vein (EJV) is a superficial central vein located away from major neurovascular structures with less anatomical variation than other central veins, possibly accounting for the lower risks of major complications after EJV cannulation relative to those noted with other central vein cannulations. The external jugular vein is located on the surface of the body. As shown in **Figure 2**, when the external jugular vein is fixed with the index finger and thumb of the left hand, it is tensed. Furthermore, when the patient is forced by the Valsalva maneuver [4], the external jugular vein is further distended, as if peripheral veins had been tied with a tourniquet. Unlike deep vein puncture (internal jugular vein, subclavian vein, femoral vein), ultrasound is not required, making it easy to puncture. Complications from subclavian vein puncture have been reported to be pneumothorax (0.5% - 4%) and arterial puncture (0% - 3%) [5]. Although internal jugular vein puncture is unlikely to cause pneumothorax, arterial puncture may occur in rare cases, and methods using ultrasound have been devised to safely access internal jugular vein puncture.

Actually, the EJV has fewer chances of pneumothorax and arterial punctures. Additionally, the EJV is more visible than other central veins and located closer to the heart than peripheral veins. Therefore, when Ali M *et al.* [6] compared PSVT (Paroxysmal supraventricular tachycardia) administration through the antecubital route and external jugular vein, initial dose of adenosine 6 mg, the success rate of PSVT through the antecubital vein was 14/25 (56%), while that through the external jugular vein was 20/21 (95%) was the success rate. They concluded that the external jugular vein route of administration of adenosine is a safe, dose saving and cost effective approach in treating patients with PSVT.

Since it is common practice to use the EJV for peripheral venous cannulation in our hospital emergency department and sometimes during cardiopulmonary resuscitation (CPR) [7], we felt the need to emphasize the importance of this route. The only drawback of EJV cannulation is suspected or documented cervical spine injury and neck immobility since EJV cannulation generally requires turning off the neck. Use of the EJV for peripheral cannulation is somewhat controversial during CPR. Because pausing chest compressions during the procedure may take time, EJV cannulation should only be used after other peripheral vein access attempts have failed, despite our positive experiences in these situations. Long interruption in chest compressions must be avoided. In our experience, cannulation of the EJV is not time consuming. Therefore, the EJV is also an effective route during CPR, and as mentioned above, it is also a route that allows the drug (adrenaline) to reach the heart quickly. The only drawback of EJV cannulation is suspected or documented cervical spine injury and neck immobility since EJV cannulation generally requires turning off the neck.

### 4. Conclusion

External jugular vein cannulation is an easily and safely performed bedside tech-

nique that can prove useful in the clinical management of patients with poor peripheral venous capital.

### Conflicts of Interest

There are no conflicts of interest.

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