The Patterns of the Cephalic Veins Termination

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ABSTRACT

Objective: To study and classify the types of the terminations of the cephalic veins in the Thais and compare the percent count of each type between male and female, right and left sides.
Methods: The ending part of the cephalic veins were dissected and classified in Thai cadavers. Each type was shown by photograph, diagram, number and percent count.
Results: The cephalic vein, studied from 208 upper extremities, had three types of termination. Type I, cephalic vein terminated in axillary vein; type II termination was external jugular vein; type III termination was axillary vein and external jugular vein.
Conclusion: The termination of cephalic veins were shown and classified into three types and sex had no influence on the patterns of cephalic vein termination.

Keywords: Cephalic vein; termination

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Cephalic vein is a large superficial vein of the upper extremities. It originates over the anatomical snuffbox at the base of the thumb and drains blood from the dorsal venous plexus.[1] At forearm, the cephalic vein ascends in the anterolateral part to the elbow and connects with the basilic vein by the median cubital vein.[2] It relates the lateral border of M.Biceps brachii along the arm and runs between M.Deltoideus and M.Pectoralis major. It reaches the infraclavicular fossa then turns medially and pierces the clavipectoral fascia.[3] It receives the tributaries which corresponds with the branches of the thoracoacrornial artery and terminates in axillary vein which is the most common type. This type is referred to the Human Anatomy,[4] Gross Anatomy in Practice, Gray's Anatomy, Grant's Atlas of Anatomy[5] and Clinical Anatomy. But, to classify the termination is still undefined. In this study, cephalic veins and their terminations were dissected and the patterns of the terminations of the cephalic veins in the Thais were reported.

MATERIALS AND METHODS

Two hundred and eight upper extremities of 108 Thai cadavers were studied for the terminations of the cephalic veins. These specimens had been used in Gross Anatomy class of medical student at the Faculty of Medicine Siriraj Hospital, Mahidol University.

After skinning the arms and pectoral region, the dissection of superficial fascia and the cephalic veins were made along the arm and forearm. At the deltopectoral triangle, anterolateral part of the clavicle, subclavian triangle and the lower part of occipital triangle, the terminations of the cephalic vein were classified and shown in photographs (Fig 3,4) and diagrams (Fig 1,2). Besides, the number and percent count of each type also were shown in Table 1,2 and Fig 5.

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RESULTS

The termination of cephalic vein in the Thais was divided into three types, namely:

Types I: The most common type, cephalic vein pierces the clavipectoral fascia and terminate in axillary vein medial to the upper border of M. Pectoralis minor (Fig 1,2,3). We found 193 cases from 208 specimens (92.70%). In males, 51 specimens (96.2%) of type I were found in the right arm and 48 specimens (94.1%) in the left. In female, 46 specimens (90.2%) of type I were found in the right arm and 48 specimens (90.6%) in the left. (Table 1, Fig 5)

Type II: The cephalic vein crosses the anterolateral part of clavicle, turns medially, passes the carotid triangle and terminates in the external jugular vein. (Fig 1,2) We found 5 of 208 specimens (2.4%). Only 2 of 5 were found in females right arm. In the left, only 1 specimen (2%) was found in male and 2 specimens (3.8%) in females. (Table 1, Fig 5)

Type III: Ten of 208 specimens (4.8%) were found that cephalic vein divided into two branches: the lower branch terminates in axillary vein and the upper branch crosses the clavicle and ends at the external jugular vein. (Fig 1,2,4). In male, there were 2 specimens (3.8%) in the right arm and, 2 specimens (3.9%) in the left. In female, 3 specimens (5.9%) were found in the right arm, and 3 specimens (5.7%) were found in the left. (Table 1, Fig 5)

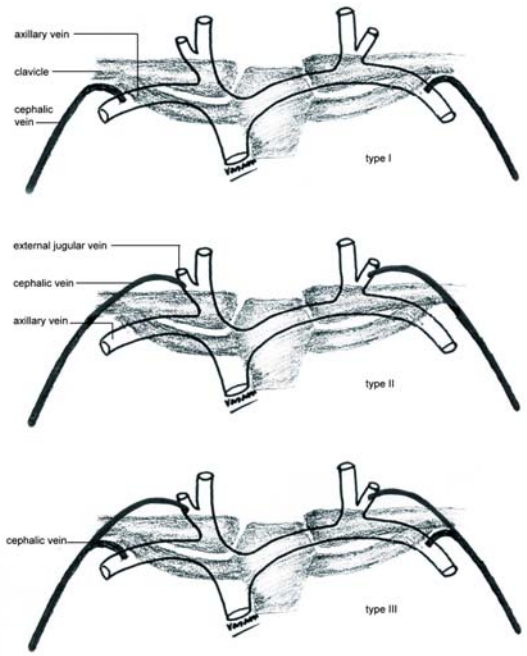


Fig 1. Diagram, showing the three types of cephalic vein termination.

DISCUSSION

The cephalic vein, the important superficial vein, is always used for catheterization.[6,7] In spite of being the third choice for superficial vein catheterization of the upper extremities, it is still necessary to clearly understand.[8,9] As thrombophlebitis always occurs in long-term catheterized patients,[10] physicians should have other choices of superficial vein for catheterization.[11,12] Thus, the study of its pattern and termination is necessary. In many textbooks

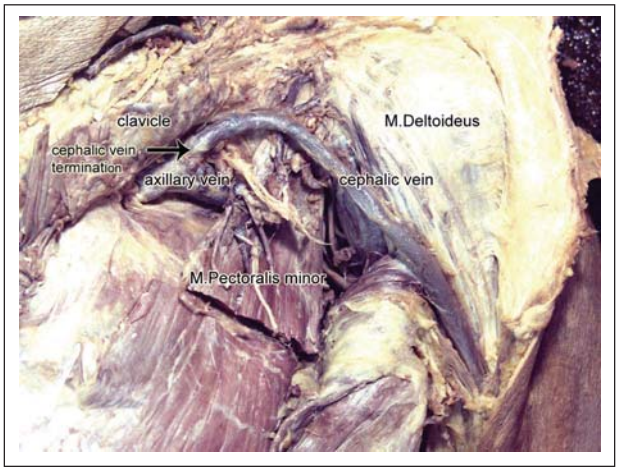


Fig 3. Cephalic vein terminates in the axillary vein.

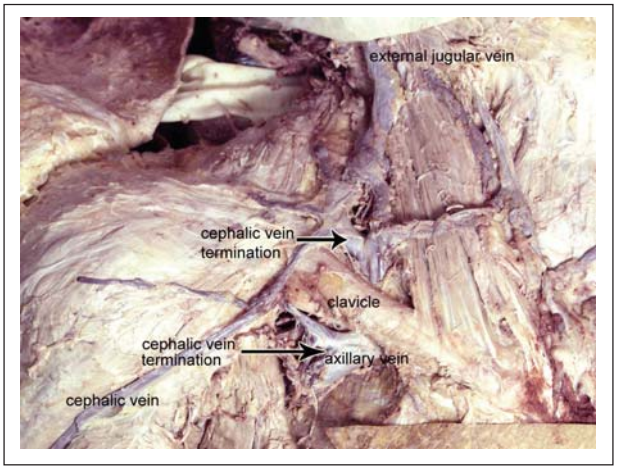
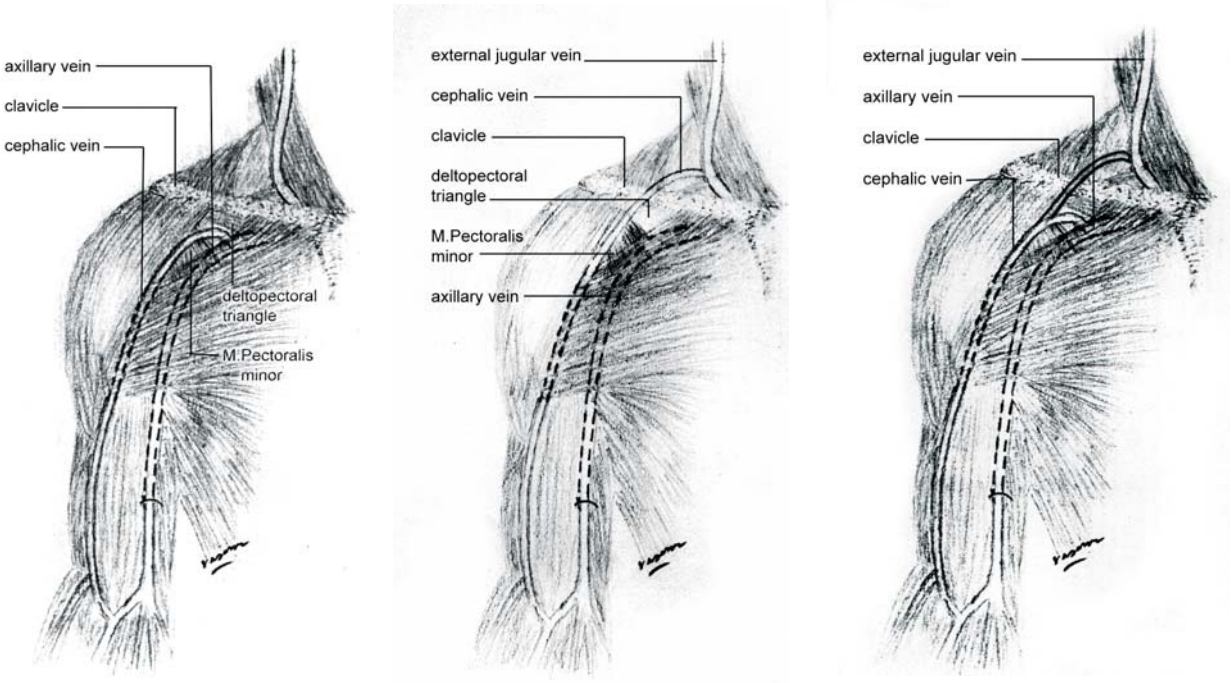


Fig 4. Cephalic vein terminates in the axillary vein and external jugular vein.



type I **type II** **type III**

Fig 2. Diagram, showing the relations of cephalic vein at its termination.

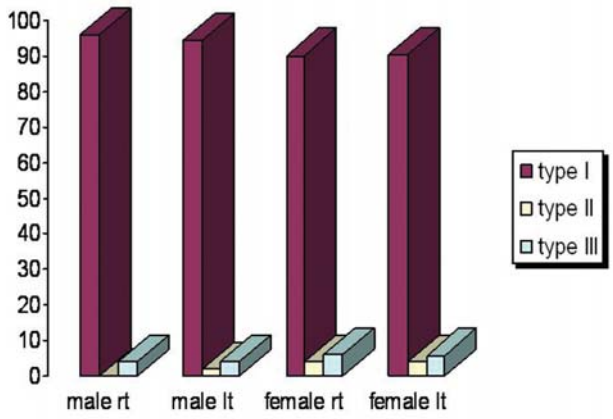


Fig 5. The percent count of the three types of the cephalic vein terminatio

TABLE 1. The number and percent count of the three types of cephalic vein termination.

Type	Male		Female		Total
	Right	Left	Right	Left	
Type I	51 (96.2%)	48 (94.1%)	46 (90.2%)	48 (90.6%)	193 (92.79%)
Type II	-	1 (2.0%)	2 (3.9%)	2 (3.8%)	5 (2.40%)
Type III	2 (3.8%)	2 (3.9%)	3 (5.9%)	3 (5.7%)	10 (4.81%)
Total	53 (100%)	51 (100%)	51 (100%)	53 (100%)	208 (100%)

TABLE 2. Comparison of the number of the three types between male and female. P-value also is shown.

Type	Male (rt,lt)	Female (rt,lt)	P- value
Type I	99 (95%)	94 (90.38%)	>0.05
Type II	1 (0.96%)	4 (3.85%)	>0.05
Type III	4 (3.8%)	6 (5.76%)	>0.05

(rt = right, lt = left)

such as Basic Gross Anatomy, Human Anatomy etc. it is reported that the cephalic vein terminates in axillary vein.[4] Refer to Gray's Anatomy and Cunningham's Textbook of Anatomy, the cephalic vein terminates in the axillary vein but sometimes in the external jugular vein.[1] However, the pattern of the termination of the cephalic vein is not classified. In this study, we clarified the patterns of the termination of the cephalic vein in the Thais into 3 types. Type I was the most common type, the cephalic vein ends in the axillary vein. Type II, the cephalic vein crosses the clavicle and ends in the external jugular vein. Although we found this type only 2.4% from 208 upper extremities) but it passes superficially to the clavicle so that it may be easily injured. We found 4.8% of type III (from 208 specimens), the cephalic vein divided into 2 branches: one of them ends in the axillary vein and the other ends in the external jugular vein.[9] The fracture or dislocation of clavicle would make the upper branch of the cephalic vein injury but we could ligate it and the other could drain blood normally. Cardiac cannulation in the cephalic vein termination type I must be careful because its termination forms an acute angle to the axillary vein while the type II forms an obtuse angle to the external jugular vein. In type III, the cephalic vein divides into two small branches that often narrow along their paths. So the risk of mechanical phlebitis is increased in type III. The statistically analysis (Chi-square) was used in this study. The comparisons between sex, male and female, were not significant. (Table 2) The P-value was more than 0.05, shows that sex does not influence the pattern of the cephalic vein termination.

CONCLUSION

The patterns of the cephalic vein terminations in the Thais were divided into 3 types. Type I, the most common type, the cephalic vein forms an acute angle and ended in axillary vein. Type II, the cephalic vein crosses the clavicle and ends in the external jugular vein with obtuse angle. Type III, the cephalic vein is divided into 2 branches. The upper branch crosses the clavicle and ends in the external jugular vein and the lower branch ends in the axillary vein. Sex does not influence the pattern of the cephalic vein termination. This study shows the types of termination of the cephalic vein that may be useful for anatomical study in the Thais, the surgical treatment at the lower part of the neck and clavicle (such as: supraclavicular region, infraclavicular fossa, subclavian triangle and occipital triangle), catheterization and cardiac cannulation.

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บทคัดย่อ

แบบแผนการสิ้นสุดของหลอดเลือดดำเศฟาลิกในคนไทย

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การศึกษาแบบแผนของการสิ้นสุดของหลอดเลือดดำเศฟาลิกในคนไทย โดยการชำแหละจากอาจารย์ใหญ่ที่ใช้ในการเรียนมหกายวิภาคศาสตร์ ภาควิชากายวิภาคศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล พบว่า แบ่งออกเป็น 3 แบบ คือ แบบที่ 1 หลอดเลือดดำ เศฟาลิกเทเลือดเข้าสู่หลอดเลือดดำแอกซิลลารี แบบที่ 2 หลอดเลือดดำเศฟาลิกเทเลือดเข้าสู่หลอดเลือดดำเอ็กซ์เทอร์นัลจูกูลาร์ แบบที่ 3 หลอดเลือดดำเศฟาลิกแตกออกเป็น 2 แขนง แขนงบนเทเลือดเข้าสู่หลอดเลือดดำเอ็กซ์เทอร์นัลจูกูลาร์ แขนงล่างเทเลือดเข้าสู่หลอดเลือดดำแอกซิลลารี และ เพศ ไม่มีผลต่อแบบแผนของการสิ้นสุดของหลอดเลือดดำเศฟาลิกในคนไทย