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A Study of Superficial Venous Patterns of the Cubital Fossa Among Iraqi Population

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Abstract

Blood can be drawn from the cubital fossa's superficial veins for transfusion, analysis, and intravenous therapy. The superficial veins (basilic vein (BV), cephalic vein (CV), median antebrachial vein (MCV), and median cubital vein (MCcV)), are usually visible through the skin and are anatomically variable.

This study aims to identify the variation of superficial venous arrangement in "the cubital fossa". For about two to three minutes, a tourniquet was placed 10-15 cm proximal to the cubital fossa with strong finger flexion and extension till the veins were revealed for inspection.

In the cubital fossa, six different kinds of superficial venous patterns were found. There are two types of pattern categories (majors and minors) for 300 volunteers. The pattern types I, II, and III were the high percentage of total patterns among the Iraqi population, with 83.33% and 82.67% for males & females, respectively. While types IV, V, and VI had the lowest percentages, 16.67% for males and 17.33% for females.

In conclusion, knowing pattern types gives a preliminary indication of educational importance for anatomists during dissections and clinical importance for surgeons and medical staff (nurses in particular) to avoid the damage that may happen while dealing with this anatomical region.

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Introduction

Although veins may be simply classified into deep and superficial veins, both groups include valves, that are more prevalent in deep veins. According to the relation between the veins and "deep fascia," the types "superficial" and "deep" in veins were categorized [1]. On the front of the elbow, the "cubital fossa" is visible as a dip [2]. Doctors, nurses, or laboratory technicians use venipuncture as a medical

method to obtain venous blood samples [3,16-18].

In the cubital fossa, there is a significant amount of variance in the placement of the superficial veins [4-6]. Numerous populations and races have been observed to have different superficial cubital vein patterns [7-10]. Knowing these patterns is clinically important to surgeons and nurses to avoid vein and nerve damage, particularly those in whom the cephalic and basilic veins do not communicate [11].

This study set out to identify and define the anatomical differences of “the cubital fossa's superficial veins” in the Iraqi population.

Methodology

This descriptive cross-sectional study occurred in Karbala city during the first six months of 2022. This research aims to identify the Cubital Fossa patterns among the Iraqi population. The research was approved ethically by the scientific committee of the Basic Medical Science department in the College of Dentistry at Karbala University. Three hundred students of different ages were examined based on the classical approach by wrapping the upper arm with a tourniquet. There are no specific criteria that depend on this study except the examined person should be healthy, and those with vein diseases in their history were excluded.

For each picture, the position of the superficial veins was determined by identifying them on a computer using (image software), there was a right-side and left-side pattern. The textual analysis by using the thematic method was dependent (Data of examination results was converted from Qualitative to quantitative by giving “Latin numbers” I, II, III, IV, V, and VI with descriptions in detail for each pattern). Pearson Chi-Square test is used to analyze the data.

Results

In the current study, there are six venous patterns were spotted in the cubital fossa, as shown in Table 1, figure 1, and figure 2.

Type I is a pattern in which two terminal branching, the MCV, and MBV, connect the CB and CV, accordingly, while the dominant median antebrachial vein MAV continues. This kind is characterized as either “Y” or “M” shaped.

Type II is a pattern in which a poorly formed MAV terminates at the cubital MCV, and links the cephalic BV and CV. This kind is characterized as either “N” or “H” shaped.

Type III presents are characterized as “O” or “I” shaped if there is no communication branch between BV and the CV.

Type IV is a pattern in which the MAV is draining into the CV or BV below the cubital fossa, and the CV is draining into the BV while the CV is underdeveloped or absent.

Type V is a pattern where MAV drains into the CV.

Type VI is a pattern in which an arching vein connects the BV, and CV so that two maybe more forearm veins drain into a proximally directed concavity.

These patterns were classified based on their incidence. Type I is the most common pattern in comparison with type VI, which is the less frequent. The familiar pattern of superficial veins of the “right cubital fossa” in males & females is the type I with 44.67% & 36.67%, respectively. The type II patterns come in second, with 20% of males & 31% of females. Type III patterns were found in 18.67% of males and 21.33% of females. Although, other patterns (type IV, V, and VI) were noted at less than 10% in both genders; therefore, we classified them as minor venous patterns. Since the p-values for the “Pearson Chi-Square test” were 0.85 and 0.71, accordingly, there is no statistically significant variation in the patterns of superficial veins on the right and left “cubital fossa” with sex.

On the left side, the 1st pattern is also the most common type in males and females, with 44.67% and 50%, respectively. Like the right cuboidal fossa result. The 2nd pattern is also the second most usual

type in the left arm of males, 21.33%, & females, 16.67%. The 3rd pattern was seen in 16% of females and 17.33% of males. 4th, 5th, and 6th patterns were only identified in a very tiny fraction, between 4.0 to 8.0%.

Table 1:- Description of venous patterns in the Cubital Fossa.

Venous Pattern Categories	Venous Pattern shape	Venous Pattern Types	Venous Pattern Description
Major	"Y"	I	MAV joins with MCV & MBV
	"N" or "H"	II	MAV joins MCcV
	"I" or "O".	III	MAV joins BV
Minor	No communicated	IV	MAV joins CV to BV
	indirect communicated	V	MAV Joins CV
	indirect communicated	VI	MAV joins CV & BV through its tributaries

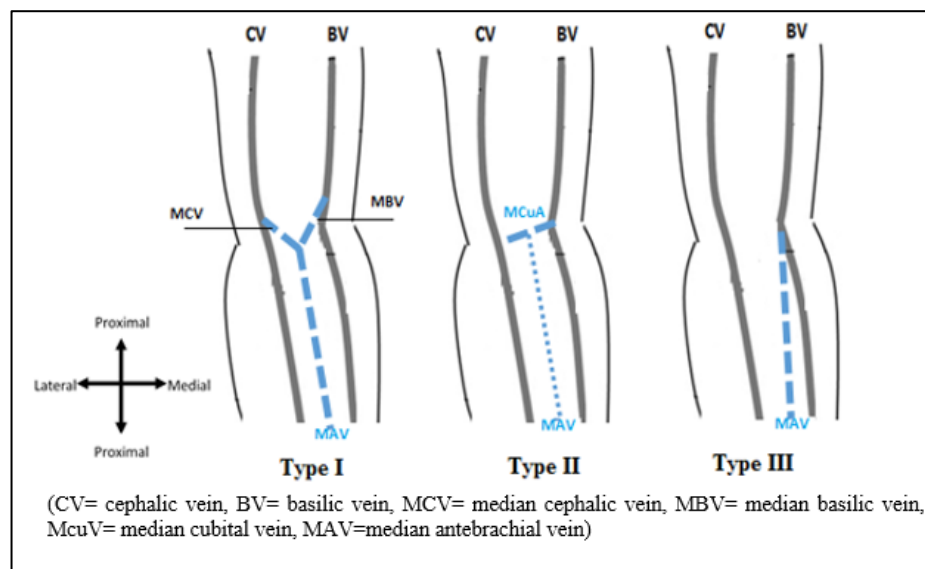


Figure 1 Major types of venous pattern

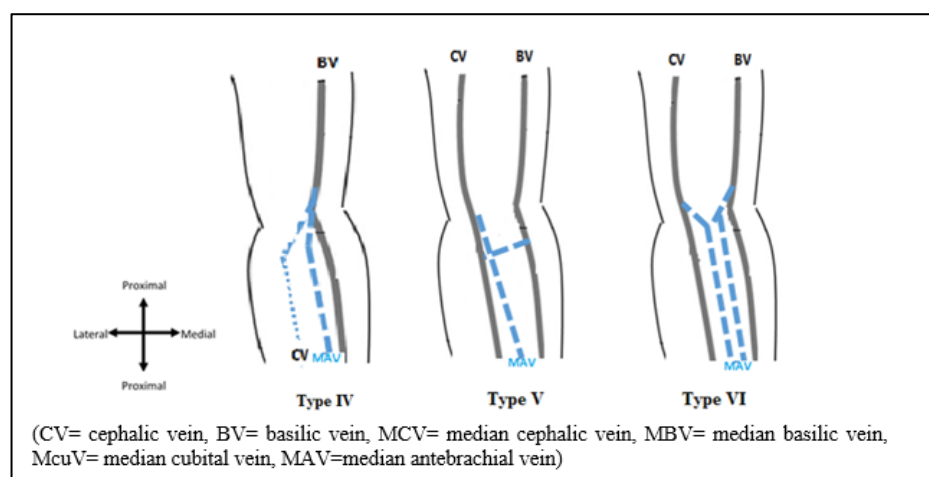


Figure 2 Minor types of venous pattern

Table 2: Superficial venous patterns of cubital fossa in male & female (right side)

Pattern	Male (n,%)	Female (n,%)
I	67(44.67)	55(36.67)
II	30(20)	31(20.67)
III	28(18.67)	32(21.33)
IV	10(6.67)	10(6.67)
V	6(4)	10(6.67)
VI	9(6)	12(8.00)
Total (N,%)	150 (100)	150 (100)
p-value a	0.71	

Table 2: Superficial venous patterns of cubital fossa in male & female (left side)

Pattern	Male (n,%)	Female (n,%)
I	67(44.67)	75(50)
II	32(21.33)	25(16.67)
III	26(17.33)	24(16)
IV	12(8)	10(6.67)
V	8(5.33)	9(6)
VI	5(3.33)	7(4.67)
Total (N, %)	150 (100)	150 (100)
p-value a	0.85	

Discussion

In this study, superficial venous patterns were classified based on their prevalence, as shown in Tables 2 and 3. Pattern types I, II, and III were the high percentage of total patterns among the Iraqi population, with 83.33%, and 82.67% for males & females, respectively.

The pattern types IV, V, and VI had the lowest percentage, 16.67% in males and 17.33% in females. Therefore, in comparison between the two groups based on pattern prevalence, the first three patterns are classified as major types and the last three as minor types.

This study agrees with previous studies that depend on the same population in pattern prevalence. We disagree with other studies on pattern classification as major and minor groups [12, 13].

The classification of anatomical patterns varies in different studies, and this depends mainly on the research methods. Studies that depend on advanced equipment such as ultrasound and cadaveric studies results differ from studies based on classic methods, considering the anatomical differences between races [13,14]

The use of new methods, data collection from different ages, non-funding studies, and the population culture have an impact on participating in this kind of study, especially from the female's side; these points are considered a study limitation that affects the study results [15,19]

The new outcome of this study is giving current data on pattern prevalence which reflects in giving pattern categories compared with a previous study in 1989 [12].

Conclusion

This study gives a preliminary indication of the pattern types present in Iraqi society, which have clinical importance to surgeons as well as medical staff (nurses in particular) to avoid the damage that may happen while dealing with this anatomical region. In addition, the classification of patterns according to each country is a database essential for other researchers.

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