

Department and Institute of Human Anatomy, Medical University of Lublin

MONIKA CENDROWSKA-PINKOSZ, FRANCISZEK BURDAN,  
PAWEŁ PINKOSZ, MAGDALENA KRAUZE, PIOTR POZNAŃSKI,  
ZBIGNIEW WÓJTOWICZ

*The analysis of morphological parameters of the coronary sinus  
and the oblique vein of the left atrium on the basis  
of post-mortem examinations*

The morphology of the coronary sinus with reference to the basic anatomical parameters of the hearts finds use in modern methods, both therapeutic and diagnostic (3,4,5). Considering the origin the coronary sinus and the oblique vein of the left atrium are both remnants of the left horn of embryonal venous sinus (1,6,7,8,9). The dependence of morphological parameters of the coronary sinus and the small cardiac vein has been thoroughly analysed in reference to people of various age and sex.

The aim of the study was to assess parameters of the coronary sinus and the oblique vein of the left atrium and to estimate the ostium of the oblique vein of the left atrium to the coronary sinus.

#### MATERIAL AND METHODS

The research was carried out on 150 hearts of people aged 18–82. The autopsy material came from corpses in which no pathological changes in the heart and cardiovascular system had been observed. The material was divided according to sex. Thirty-six women's and 114 men's hearts were examined. The injection was made with the use of methacrylate resin (2). The length and diameter of the vessels was measured on the corrosion preparations.

The material was divided into various groups: I – from 18 to 25 years of age, II – from 26 to 50 years of age, III – from 51 to 60 years of age and IV – from 61 to 82 years of age.

#### RESULTS

The presence of the coronary sinus opening to the right atrium was observed in all the cases, and the oblique vein of the left atrium was present in 98% of the studied hearts. The variability of the ostium oblique vein of the left atrium opening to the proximal part of the sinus in relation to the other vessels of the coronary sinus was observed.

The measurement of the length of the oblique vein of the left atrium was made from the ostium of the vein to the sinus up to the strongest extension of the main trunk of the vessel in case of strong initial tributaries. The length of the oblique vein of the left atrium was 16 mm to 25 mm, average 20 mm. The diameter of the oblique vein of the left atrium measured from the ostium to the sinus and ranged from 1 mm to 3 mm, average 2 mm.

Analysing the topography of the oblique vein of the left atrium different groups of the vessel ostium to the coronary sinus were defined. The ostium was situated on the level of: the posterior

vein of the left ventricle and also the great cardiac vein (Fig. 1); the posterior vein of the left ventricle (Fig. 2); the great cardiac vein (Fig. 3); the independence ostium (Fig. 4).

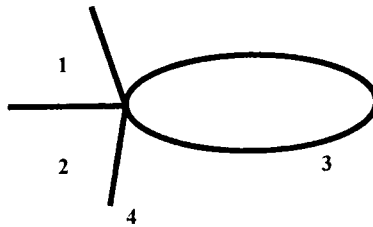


Fig. 1. The ostium of the oblique vein of the left atrium was situated on the level of the posterior vein of the left ventricle and also the great cardiac vein; 1 – the oblique vein of the left atrium, 2 – the great cardiac vein, 3 – sinus coronarius, 4 – the posterior vein of the left ventricle

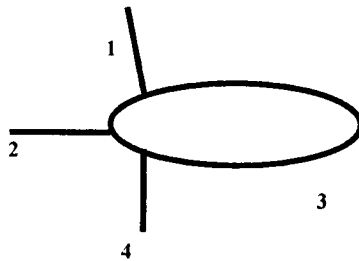


Fig. 2. The ostium of the oblique vein of the left atrium was situated on the level of the posterior vein of the left ventricle; 1 – the oblique vein of the left atrium, 2 – the great cardiac vein, 3 – sinus coronarius, 4 – the posterior vein of the left ventricle

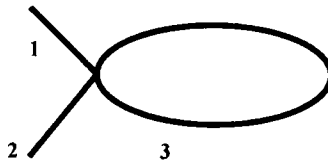


Fig. 3. The ostium of the oblique vein of the left atrium was situated on the level of the great cardiac vein; 1 – the oblique vein of the left atrium, 2 – the great cardiac vein, 3 – sinus coronarius

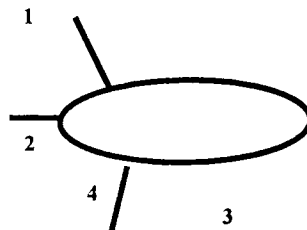


Fig. 4. The ostium of the oblique vein of the left atrium was situated independently; 1 – the oblique vein of the left atrium, 2 – the great cardiac vein, 3 – sinus coronarius, 4 – the posterior vein of the left ventricle

The length of the coronary sinus was found by measuring the distance from the ostium of the oblique vein of the left atrium to the ostium of the coronary sinus to the right atrium. It was from 25 mm to 54 mm, average 40 mm. The diameter of the coronary sinus was measured from half of the length of the dish and ranged from 6 mm to 12 mm, average 9 mm. The width and length index of the coronary sinus have been marked equal to the quotient of the width and length of the heart coronary sinus multiplied by 100.

On the base of length and diameter of the coronary sinus one qualified its width and length index. For the length of the sinus one accepted the distance from the ostium of the oblique vein of the left atrium to the ostium of the coronary sinus of the right atrium. The diameter was measured as the greatest distance of walls of the sinus in half of its length. All the cases were arranged according to the increasing value of the examined index of the coronary sinus (narrow, medium-wide, wide). The shape of coronary sinuses changes within particular age groups.

One drew up chances of human hearts according to increasing values of the index of the sinus. One marked Q I=22, Q II=22-30, Q III=30. The sinuses, whose indices were among Q I and Q II one qualified as medium-wide. The sinus with a smaller index than Q II one accepted as narrow, while the sinus with a greater index than Q III one qualified as wide.

Table 1. Composition values of width and length index of the coronary sinus for each marked group with regard to sex

	k		m		Q I < 22				Q II = 22-30				Q III > 30			
	n	%	n	%	♂	%	♀	%	♂	%	♀	%	♂	%	♀	%
I	12	100	21	100	5	42	6	28	7	58	14	67		0	1	5
II	11	100	65	100	4	36	14	22	6	55	47	72	1	9	4	6
III	5	100	14	100	2	40	4	29	3	60	9	64		0	1	7
IV	8	100	14	100	1	12	1	7	7	88	12	86	-	0	1	7
Total	36	100	114	100	12	33	25	22	23	64	82	72	1	3	7	6

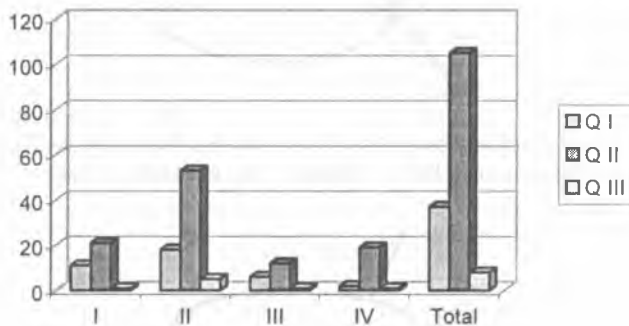


Fig. 5. Composition values of width and length index of the coronary sinus for each marked group

In the examination woman made up 64%, while men 72%. Among the women there were 33% cases with narrow sinus, whereas 64% with medium wide sinus. The chances of wide sinus incidence were calculated and these appeared in 3%. Among men, however, the sinuses of the index greater than Q III emerged in 6%, medium wide in 72%, whereas narrow in 22%. Statistically significant linear dependence between the width and length of the coronary sinus has been discovered ( $p < 0.001$ ). The measurement analysis of the length and diameter of the oblique vein of the left atrium also showed high statistic dependence ( $p < 0.001$ ). Regression analysis

between the examined parameters has been conducted. There was no basis to state statistically significant linear dependence between the indices of the oblique vein of the left atrium and the sinus among particular age and sex group ( $p > 0.05$ ).

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#### SUMMARY

The interest in morphology of the coronary sinus and its tributaries is connected with the development of operative cardiology and open heart surgery. Considering the origin of the coronary sinus and the oblique vein of the left atrium are both remnants of the left horn of embryonal venous sinus. The dependence of morphological parameters of the coronary sinus and the oblique vein of the left atrium has been thoroughly analysed in reference to people of various age and sex groups. The aim of the study was to assess parameters of the coronary sinus and the oblique vein of the left atrium and to estimate the ostium of the oblique vein of the left atrium to the coronary sinus. In the study, dissections and corrosion techniques were used. Hearts veins were filled with metacrylan through the coronary sinus. The measurement of the length and width of the coronary sinus and the oblique vein of the left atrium were made. The width and length index of the coronary sinus has been marked. The variability of ostium of the oblique vein of the left atrium opening to the proximal part of the sinus in relation to the other vessels of the coronary sinus was found. Analysing the topography of the oblique vein of the left atrium different groups of the vessel ostium to the coronary sinus were defined. Thanks to the statistical analysis the considerably significant interdependence between the length and index of the studied veins was proved.

Analiza parametrów morfologicznych zatoki wieńcowej i żyły skośnej przedsionka lewego  
w oparciu o badania pośmiertne serca

Zainteresowanie morfologią zatoki wieńcowej i jej dopływów związane jest z dynamicznym rozwojem kardiologii zabiegowej i kardiologii. Celem pracy była ocena parametrów morfologicznych zatoki wieńcowej i żyły skośnej przedsionka lewego. Rozwojowo oba te naczynia wywodzą się z lewego rogu zatoki żyłnej. Badania przeprowadzono na 150 sercach ludzi dorosłych w wieku od 18 do 82 lat. Materiał sekcyjny pochodził ze zwłok, u których nie stwierdzono zmian patologicznych w sercu i układzie naczyń krwionośnych. Szczegółowej analizie poddano długość i średnicę obu naczyń. Porównując ich parametry, wyliczono wskaźnik szerokościowo-długościowy zatoki wieńcowej i żyły skośnej przedsionka lewego. Otrzymane

wyniki pomiarów poddano analizie statystycznej. Wykazano istotne statystycznie zależności pomiędzy analizowanymi pomiarami w badanych grupach wiekowych. Nie stwierdzono natomiast istotnych statystycznie zależności badanych parametrów w stosunku do płci. W przeprowadzonych badaniach zaobserwowano, iż ujście żyły skośnej przedsionka lewego znajduje się w różnym położeniu w stosunku do pozostałych dopływów tej części zatoki. Wykazano cztery typy ujścia badanej żyły: 1 – na wysokości ujścia żyły wielkiej serca i żyły tylnej komory lewej, 2 – na wysokości ujścia żyły tylnej komory lewej, 3 – na wysokości ujścia żyły serca wielkiej. 4 – niezależnie od ujść pozostałych dopływów zatoki.