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About variability of Vieussen valve in the adult human heart

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The Vieussen valve is situated at the ostium of the great cardiac vein to the coronary sinus. There are no details about its shape in anatomic literature. The tested material consisted of 150 adult human hearts of both sexes from 18 to 85 years of age, fixed in a formalin/ethanol solution. Classical macroscopic anatomical methods were used. The Vieussen valve was found in about 65% of the tested material. It showed a large variability in terms of morphology.

key words: human heart, Vieussen valve

INTRODUCTION

The Vieussen valve is placed at the ostium of the great cardiac vein to the coronary sinus. In 1867 Gruber [1] observed it in 78% of the tested hearts. Later on it was described by Kampmeier and Birch [2], Sarrazin [8], Smith [10] and Tandler [11]. These scientists confined themselves to ascertaining the presence of the valve without giving any statistics. There is no information about the shape of the valve in the works of any Polish or foreign authors, either. The authors prove that the Vieussen valve in coexistence with a well developed Thebesius valve may impede catheterization of the coronary sinus [3]. That is why it is necessary to possess a detailed knowledge of the morphology of the valve. Frequency of occurrence of the Vieussen valve was tested and the degree of its formation was charted in this paper.

MATERIALS AND METHODS

150 adult human hearts of both sexes from 18 to 85 years of age were used, fixed in a formalin/ /ethanol solution. Classical macroscopic anatomical methods were used.

RESULTS

The Vieussen valve was present in 65.1% of the tested hearts. In terms of its morphology two types of valves were selected:

— the first type: a complete valve totally dividing the light of coronary sinus. Single, double and triple valves, the leaflet ends of which touched each other, were observed.

— the second type: an incomplete valve which only partially divided the light of the sinus. Single and double valves, the leaflet ends of which did not touch each other, were observed.

Frequency of occurrence and the types of Vieussen valves in the tested material are shown in Table 1. The Vieussen valve was usually a complete single (Fig. 1) or double one (Fig. 2). Only in one heart was there a complete triple valve. The valves belonging to the second type were in the minority. The single incomplete valve (Fig. 3) was situated between the ostium of the oblique vein of the left atrium and the ostium of the great cardiac vein to the coronary sinus or between the ostium of the posterior vein of the left ventricle and the ostium of the great cardiac

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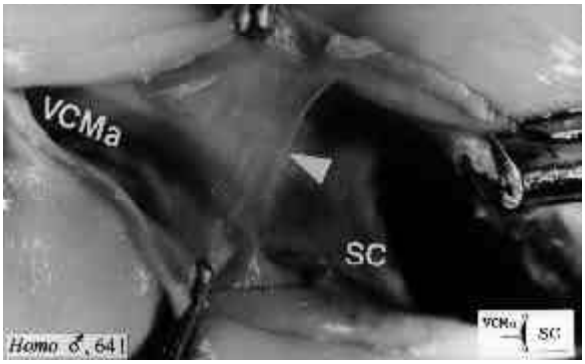


Figure 1. Complete Vieussen valve single. Abbreviations: SC – sinus coronarius; VCMa – vena cordis magna

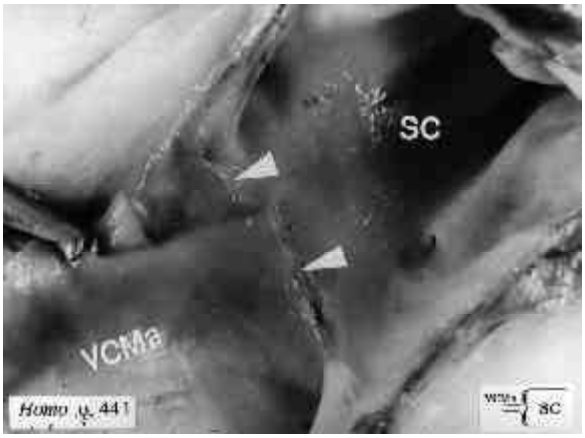
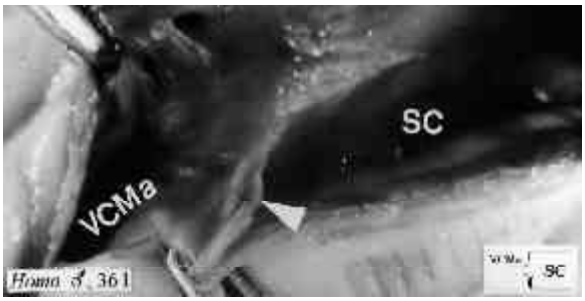


Figure 2. Complete Vieussen valve double



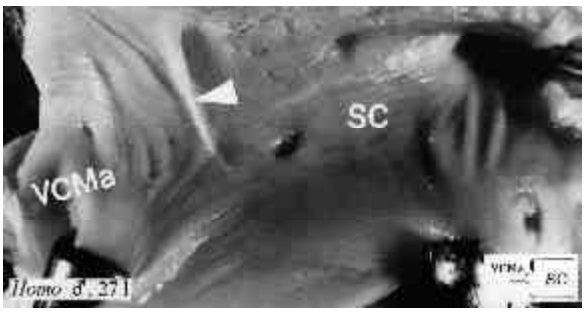


Figure 3. Incomplete Vieussen valve single

vein to the sinus. The double incomplete valve was present in 6.6% of the tested material (Fig. 4).

DISCUSSION

Gruber [1] drew attention to the half-moon shape of the Vieussen valve in his subjects. He stated that it occurred less frequently in the hearts of young people and newborns. Maros et al. [4] found its presence in 77.7% of cases. In 5.5% of the hearts the valves were securely fixed to the back wall of the coronary sinus, and in 22.2% they looked like a fragmented fold. In other cases they looked like "the remains of a fold". Parsonnet [5] observed the Vieussen valve in 80%, and Ratajczyk-Pakalska [7] in 76% of the cases. Silver and Rowley [9] noticed these valves in human hearts of a normal weight in 76% and in the hearts of enlarged weight in 80% of the tested material. It seems that these differences are not significant. Piffer et al. [6] distinguished double and single Vieussen valves at the ostium of the great cardiac vein to the coronary sinus. The authors do not note the permanent presence of the valve and do not give any statistics. Many researchers describe

Figure 4. Incomplete Vieussen valve double

Table 1. Frequency of occurrence and types of Vieussen valve in the tested material

Type of Vieussen valve	Frequency of occurrence (%)
Complete:	
– single	23.3
– double	23.3
– triple	0.6
Incomplete:	
– single	11.3
– double	6.6

the frequency of occurrence of the Vieussen valve. It is extremely difficult to compare the discrepancy in the incidence of the Vieussen valve ranging from 76–80% with our research because of the age group. Types of distinctions in our ground covered hearts of humans aged from 18–85, whereas other authors [1,6] tested the hearts of newborns, children and adults without stating their age. In the analysis of our results, in relation to morphology, this valve showed a great variety. The Vieussen valve usually presented itself as a complete singular valve (23.3%) or a complete double valve (23.3%).

This examination concludes that the presence and degree of development of the Vieussen valve can be one of the reasons for the difficulty in the catheterization of the coronary sinus.

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