

Comparative research on the topography of middle and small cardiac veins in humans and other primates

Barbara Duda¹, Marek Grzybiak², Janusz Jerzemowski¹

¹Department of Anatomy and Anthropology, Jędrzej Śniadecki Academy of Physical Education and Sport, Gdańsk, Poland

²Department of Clinical Anatomy, Medical University of Gdansk, Poland

[Received 29 May 2003; Revised 9 July 2003; Accepted 9 July 2003]

Many researchers have been interested in cardiac veins, which at present play a very important clinical role in invasive cardiology. In this study the occurrence of middle and small cardiac veins and the topography of their outlet portions were examined. The material consisted of 150 adult human hearts of both sexes of 18 to 85 years of age and 50 adult hearts of representatives of various primates. In the material examined a middle cardiac vein was always observed, whereas the presence of a small cardiac vein was less consistent. The outlet portions of the main veins of the heart were characterised by significant variability.

key words: heart, cardiac veins

INTRODUCTION

Cardiac veins have inspired many researchers [3–6] and at present play an important clinical role with regard to the development of new diagnostic and therapeutic techniques and methods in cardiology. There is no comparative research into these structures in anatomical literature and only a few authors have described cardiac veins in the primate heart [2]. For this reason the frequency of occurrence and topography of the outlet portions of middle and small cardiac veins were examined.

MATERIAL AND METHODS

The material consisted of 150 adult human hearts of both sexes of 18 to 85 years of age and 50 adult hearts of representatives of various primates. Classical macroscopic anatomical methods were used and, in the case of small hearts, a binocular magnifying glass was used.

RESULTS AND DISCUSSION

In the material under examination a middle cardiac vein was always observed, whereas a small

cardiac vein was observed in 57% of human hearts and in 30% of primate hearts. The outlet portions of the main heart veins were characterised by significant variability and this mainly affected human hearts. Middle and small cardiac veins are generally directed towards the coronary sinus at its distal part (Fig. 1). Similar results have been obtained by other authors [6]. In human hearts (4.06%) and in the hearts of apes (58%) ostium of the middle cardiac vein to the coronary sinus was observed, with simultaneous absence of a small cardiac vein (Fig. 2). Moreover, the middle cardiac vein opened directly into the right atrium in 2.5% of human hearts and in 12% of apes (Fig. 3). Only a few authors have made a similar observation in their research [3]. In human hearts (4%) a small cardiac vein together with a middle cardiac vein opened into the coronary sinus as a common trunk. Furthermore, it was observed in 6% of the hearts that it opened directly into the middle cardiac vein, and in about 1% of hearts into the right atrium [1]. The results obtained are similar to those obtained by Maros et al. [4].

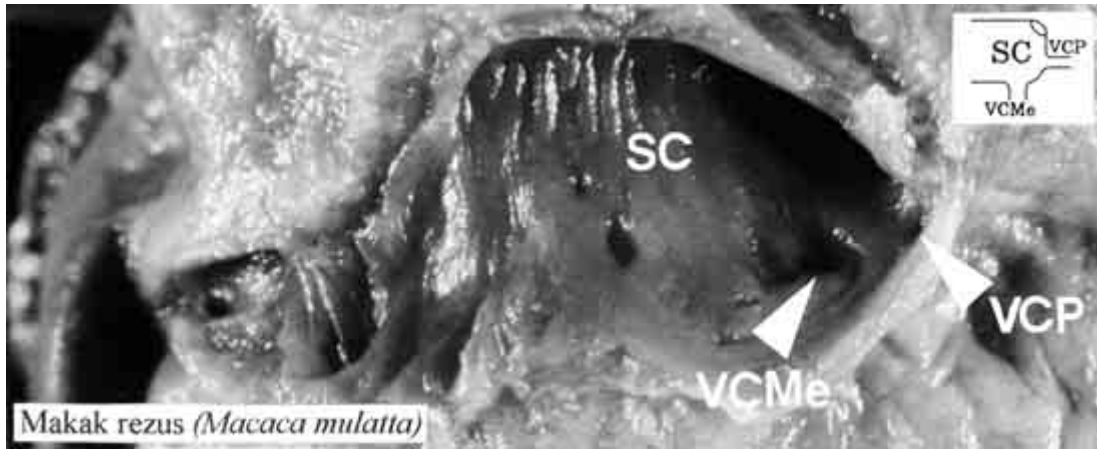


Figure 1. Outlet of the middle and small cardiac veins (VCMe, VCP) into the coronary sinus (SC).

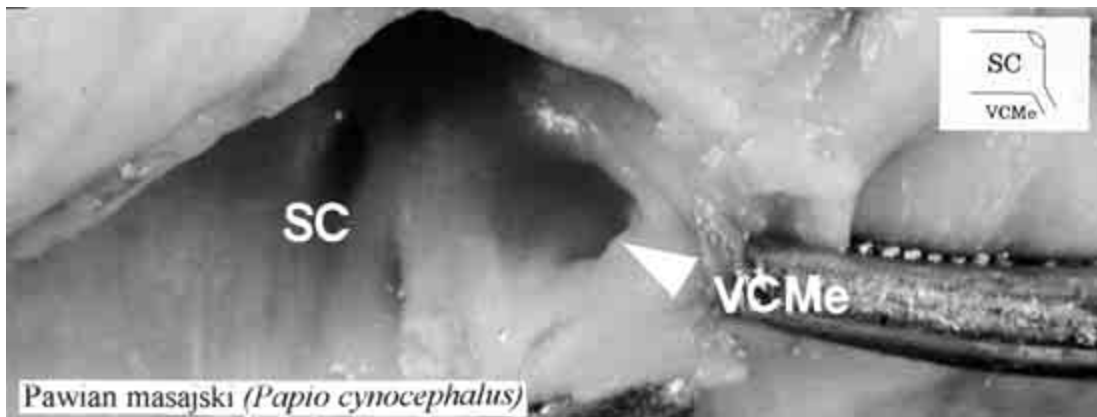


Figure 2. Outlet of the middle cardiac vein into the coronary sinus.

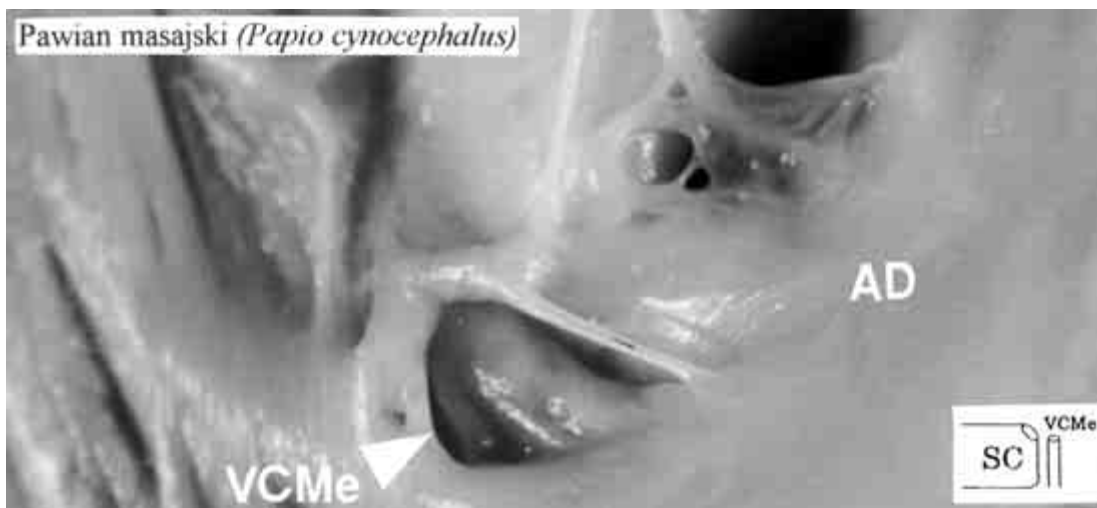


Figure 3. Outlet of the middle cardiac vein into the right atrium (AD).

REFERENCES

1. Duda B, Grzybiak M (1998) Main tributaries of the coronary sinus in the adult human heart. *Folia Morphol (Warsz)*, 57, 4: 363–369.
2. Duda B, Kuta W, Grzybiak M (1995) Morfologia zatoki wieńcowej w sercach wybranych gatunków ssaków. *Sprawozdania Gdańskiego Tow Nauk, Gdansk*, 22: 168–170.
3. Malhotra VK, Tewari SP, Tewari PS, Agarwal SK (1980) Coronary sinus and its tributaries. *Anat Anz, Jena*, 148: 331–332.
4. Maros VK, Rącz L, Plugor S, Maros TG (1983) Contributions to the morphology of the human coronary sinus. *Anat Anz, Jena*, 154: 133–144.
5. Ratajczyk-Pakalska E (1970) Żyły serca. *Folia Med, Łódź* 10: 45–68.
6. Smith GT (1962) The Anatomy of the coronary circulation. *Am J Cardiol*, 9: 327–345.