IJAE
Vol. 118, n. 2 (Supplement): 161, 2013
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

The understanding of the anatomy and functional role of the valves of the veins and its impact on hemodynamics

Riva A.[1-2], Loy F.[2], Isola R.[2], Isola M.[2] and Conti G.[2]

[1] Museum of Anatomical Waxes
[2] Department of Biological Sciences, Section of Cytomorphology, University of Cagliari, Italy riva@unica.it

Although the valves of veins were reported by some anatomists years before Fabricius ab Aquapendente (1533-1619) held his public demonstration in 1579, the first detailed description of these structures is ascribed to him, who in 1602 published the "De Venarum Ostiolis" (1). Fabricius held the chair of Anatomy in Padua for over 50 years and in the course of his long and prestigious academic career had many illustrious pupils among which there was William Harvey the future discoverer of the circulation of blood (2). Fabricius who also was a celebrated surgeon, gave important contributions in various fields of human and comparative anatomy and embryology. Concerning the valves of veins he stated, erroneously that they were little doors (ostioli) having the function of slowing the flow of blood which, according to Galen was directed away from the heart. In spite of this, it were just the "valves in the veins" that induced Harvey to think of a circulation of the blood (3). The valves functional role, in pathology as well, was clarified in the "De Motu" by a series of experiments, carried out in different animal species that proved the centripetal course of venous blood. By the same model illustrated by Fabricius and reproduced even in the "De Motu", Harvey demonstrated that a mild ligature of the human arm interrupts just the venous flow, whereas a tighter one blocks the arteries, with reversible loss of pulsation that returns upon removal of the stricture. In the centuries that followed, this last observation became instrumental in the understanding of the laws of hemodynamics and, also on the development of non invasive methods for measurement of blood pressure.

References

[1] Riva et al. (2010) The evolution of anatomical illustration and wax modelling in Italy from the 16th to early 19th centuries. J Anat 216: 209-222.
[2] Porzionato et al. (2012) The anatomical school of Padua. Anat Rec 295: 902-16.
[3] Cunningham (2006) Fabrici and Harvey, p. 132. in: Harvey e Padova, Antilia: Treviso.

Key words
Valve of the vein, Fabricius, Harvey, Riva-Rocci.