The Naming of Jugular Venous Valves

To the Editor:

In Dr Charles F. Babbs’s recent review article, he states in the Methods section that “Niemann’s valves between the chest and jugular veins at the level of the thoracic inlet are actual but little-known anatomic structures that function to block headward transmission of large positive pressure pulses in the chest during cough and also during CPR.”

The jugular venous valves have been known for centuries. Harvey was among the first to describe them, but they were probably known for at least 100 years before his publication. Anatomists had been burnt at the stake on the Continent for questioning the Roman Catholic Church’s dogma on nature.

The jugular venous bulb, which contains the jugular and subclavian valves, was well known in the 19th century, and Bamberger’s name (Osler’s teacher in Vienna) is attached to the bulb. Sir James Mackenzie popularized the jugular phlebogram, which was placed above the jugular bulb, and the sounds emitted by the venous valves have been well described by numerous cardiologists over the past century. Potain believed these valves were of importance in the genesis of the cervical venous hum; they likely cause pounding in the neck during supraventricular tachycardia.

Given the number of prominent investigators that have described the physiology, auscultatory findings, and clinical implications of these valves, I think that it is improper for Dr Babbs to associate Dr Niemann’s name with them.

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Response

I know how painful it is to have one’s work ignored, and I appreciate learning of Dr Fisher’s fine studies on the function and clinical significance of jugular venous valves, which frankly were unknown to me. The title of Dr Fisher’s own article “The Rediscovery of Intrathoracic Venous Valves,” suggests that it was perhaps reasonable of me to refer to them as “little-known anatomic structures.” My own knowledge of this subject stems from Niemann et al’s slightly earlier publications in 1981 and my own studies, published in 1980, that suggest mechanisms for preferential brachiocephalic blood flow during CPR.

In their studies of cineangiography during CPR, Niemann et al noted that “Retrograde flow into the extra-thoracic brachiocephalic veins was abruptly halted by closure of venous valves as compression continued.” Figure 5 of this article displays an angiographic snapshot of the venous valves in action. A year or so earlier, Bill Voorhees, Tack Tacker, and I (Figure 2 in Reference 3) demonstrated a jugular venous valve mechanism by continuous-pressure recording during catheter pullback during CPR. This research demonstrated that the action of jugular venous valves protects the capillary beds of the head and brain from the high venous pressure pulses caused by chest compression. As a result, we concluded, as did Niemann et al, that mean cerebral perfusion pressure tends to be greater than mean coronary perfusion pressure during CPR.

In memory of my stimulating discussions with Jim Niemann in the late 1970s and early 1980s about the importance of jugular venous valves, I tend to refer to these valves as Niemann’s valves. Perhaps in the future I should refer to them as Voorheess-Niemann-Fisher valves or, possibly, as Harvey’s valves for short. Three cheers for all the CPR researchers of the 1980s. We did a lot of good work back then, some of which may finally be coming to fruition in the form of interposed abdominal compression and phased thoracic abdominal compression-decompression (Lifestick) CPR.

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