

10.1 The Sinoatrial Node

The sinoatrial node (SN) is the heart's natural pacemaker, and it is located at the connection between the superior vena cava and the right atrial appendage in the superior part of the terminal groove. The terminal groove indicates the position of the attachment of the right appendage and the sinus venosus of the right atrium. In most cases, the SN is found at the lateral anterior surface of the superior vena cava; however, it occasionally extends over the crest of the right appendage. In such cases, the SN exhibits a horseshoe form.

In the first part of this chapter, we will discuss the morphology of the SN, including the microscopic anatomy, followed by a description of the morphological variants of the SN artery (SNA).

The topographical relationships between the SN and its neighboring structures are shown in the dry-dissected specimen in **Fig. 10.1** and its corresponding schematic drawing (**Fig. 10.2**). In all of the schematic drawings in this chapter, the SN is marked as a yellow, oval structure. On the dry-dissected specimen (**Fig. 10.1**), the SN is posi-

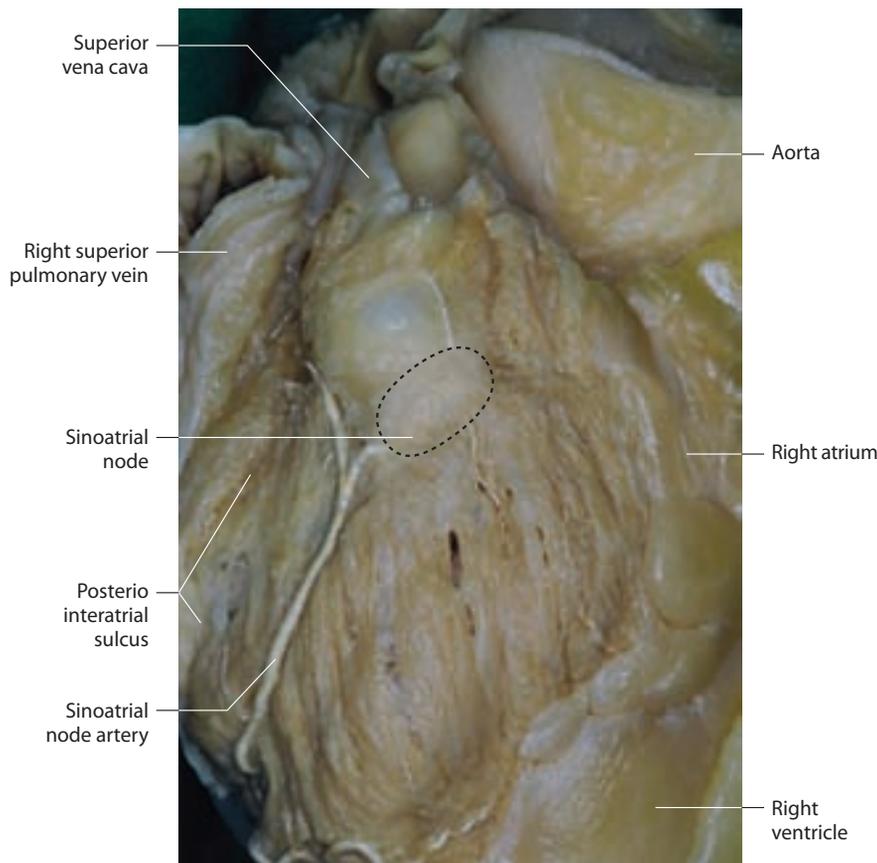
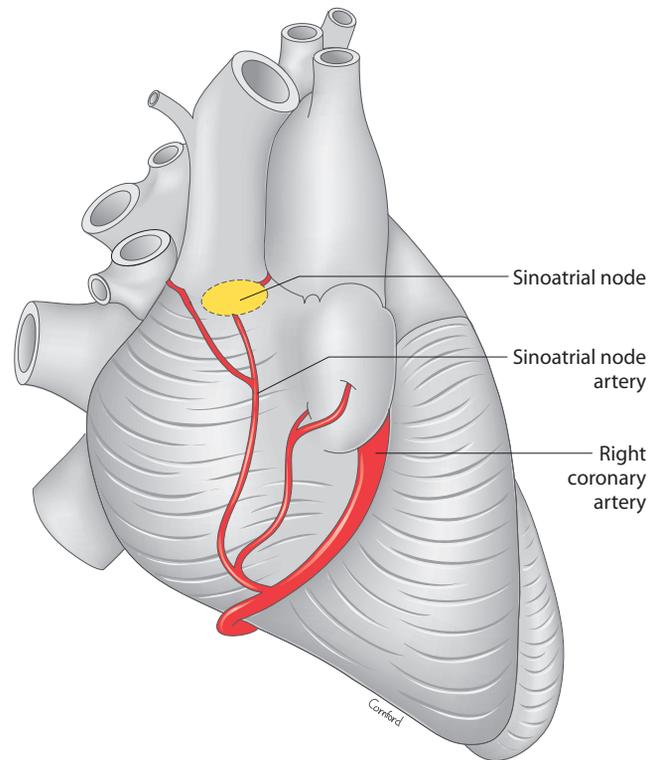


Fig. 10.2. Topography of the sinoatrial node, schematic drawing



tioned at the right lateral side of the superior vena cava, and is a white, oval structure that is approximately 2×1 cm in size. The right atrium and the SN are inspected from the right lateral direction in this figure. The SN may be relatively easily dissected because of its harder consistency as compared to the surrounding tissue. However, tracing the SNA during the dissection makes identification of the SN much easier; the artery runs though the center of the SN (**Figs. 10.1** and **10.2**), dividing within the SN into smaller branches. Thus,

Fig. 10.1. Topography of the sinoatrial node, right lateral view

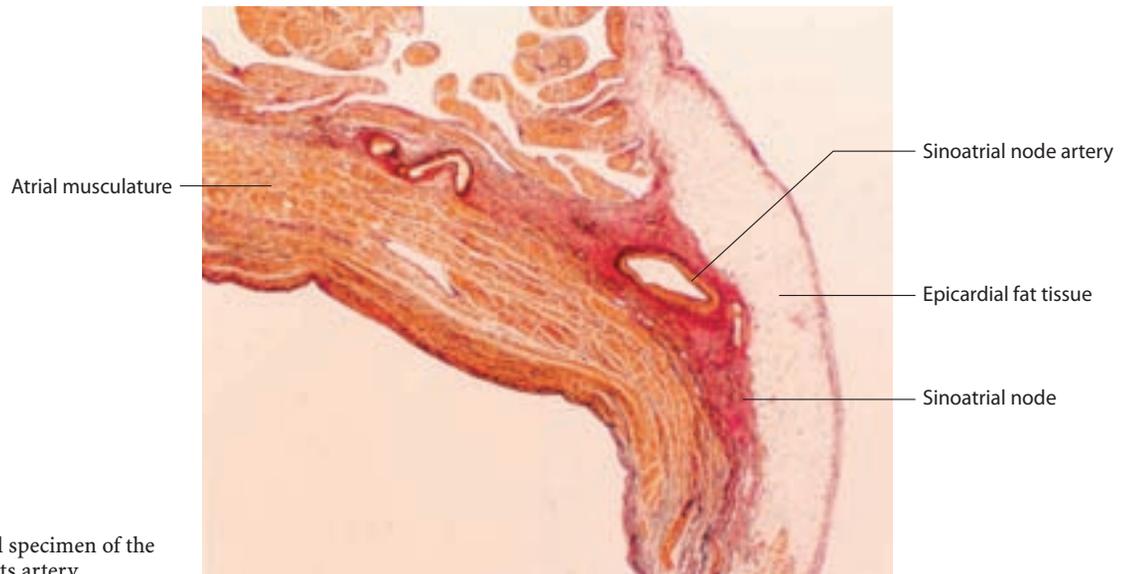


Fig. 10.3. Histological specimen of the sinoatrial node and its artery

identification of the SNA and dissection down its course toward the superior vena cava helps us to identify the SN. In the presented dry dissected specimen (**Fig. 10.1**) before entering the SN, the SNA bifurcates, the right branch running into the SN and the left toward the left atrium. Here the SNA originates from the posterior part of the right coronary artery, and that from its branching area, the artery runs along the posterior wall of the right atrium, directly toward the SN (**Figs. 10.1** and **10.2**).

To further investigate the submacroscopic anatomy of the SN, histological specimens were prepared, an example of which is presented, with a corresponding drawing, in **Figs. 10.3** and **10.4**, respectively. Tissue for this purpose was taken from the area of the connection between the superior vena cava and the right atrium. This tissue was prepared according to standard procedures for histological specimens, with sections made parallel to the long axis of the superior vena cava. The sections were stained using Orcein to emphasize the fibrous component (stains dark red) and the hematoxylin-eosin to highlight the cellular structures (stains orange). In the presented histological specimen, the SN tissue may be easily distinguished from the surrounding structures (**Fig. 10.3**). The schematic drawing in **Fig. 10.4** was made to allow a better understanding of the topographical

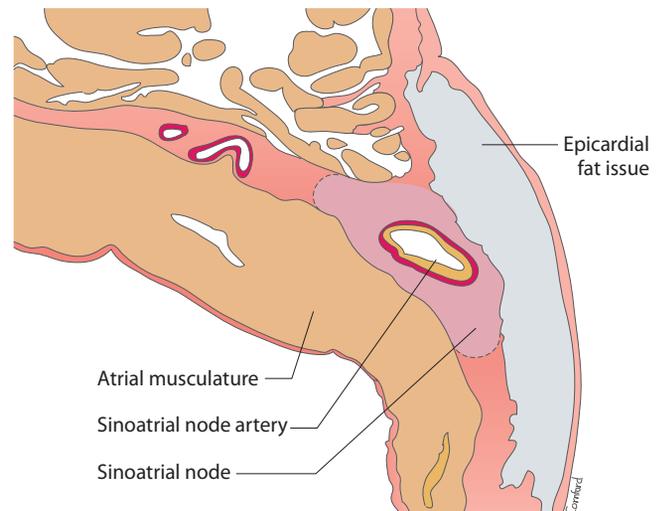


Fig. 10.4. Histological specimen of the sinoatrial node and its artery, schematic drawing

relationships. The pericardial fat tissue is found anterior to the SN, and the right atrial musculature is located posteriorly to the SN, toward the axis of the superior vena cava (**Figs. 10.3** and **10.4**).

The histological staining that we performed allows the SN to be easily distinguished from the atrial musculature (stained orange; **Figs. 10.3** and **10.4**).



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