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RIGHT ATRIAL RELATED STRUCTURES IN HORSES, OF INTEREST DURING ELECTROPHYSIOLOGICAL STUDIES

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Introduction

Catheter-based electrophysiological studies might be helpful to diagnose and treat specific cardiac arrhythmias in horses. In order to develop and standardise such electrophysiological studies, detailed knowledge about specific anatomical structures is necessary.

Study methods

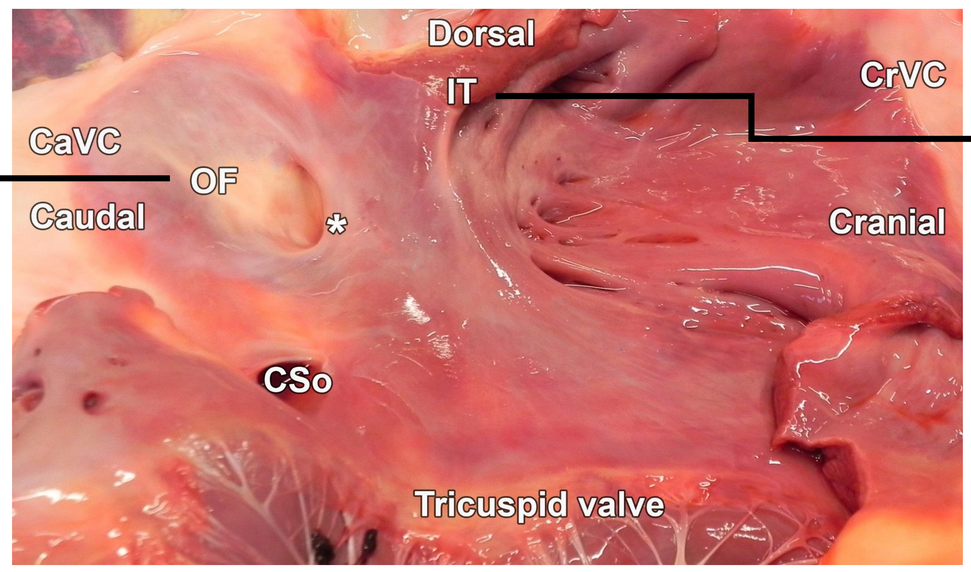
In this study, specific right atrial related structures, of importance during electrophysiological studies, were measured *post mortem* in 15 Warmblood horses. Mean (±SD) body weight was 539(±74) kg; mean cardiac weight was 4.2(±0.8) kg.

Results

Oval fossa

Transseptal puncture through the **oval fossa (OF)** would be useful to gain access to the left atrium (LA) and left ventricle (LV) via a right atrial (RA) approach.

The size of the **oval fossa (OF)** was 29(±3) mm x 59(±9) mm of which the cranial 14(±7) mm was located underneath the limbus (*).



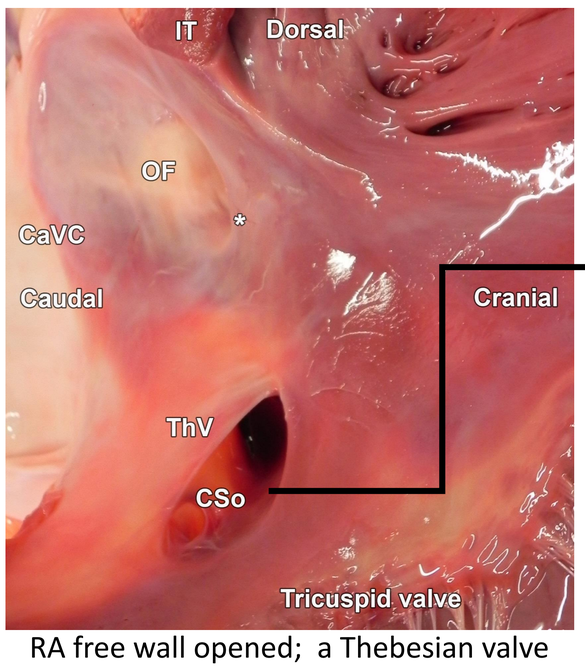
RA free wall opened; view on the inside of the RA.

Intervenous tubercle

Due to the sharp angle between **cranial vena cava (CrVC)** and **caudal vena cava (CaVC)**, the **intervenous tubercle (IT)** is a large, prominent structure of special interest during RA catheterisation, as it might hamper catheter positioning.

Coronary sinus

Catheterisation of the **coronary sinus (CS)** and **great cardiac vein (GCV)** would provide electrical information about the LA and even the LV via a RA approach, as the great cardiac vein originates at the most apical point of the LV, where it is located in the interventricular groove, and continues in the atrioventricular groove, to drain into the coronary sinus. The **middle cardiac vein (MCV**), originates at the most apical point of the RV and drains either into the coronary sinus or directly into the RA.

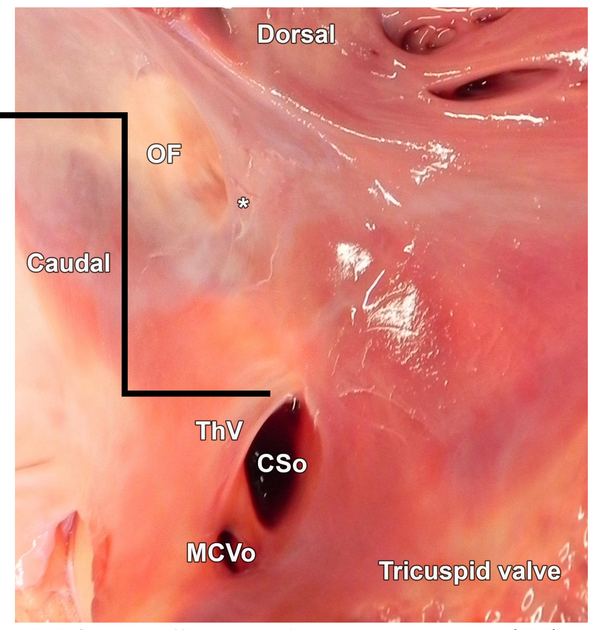


RA free wall opened; a Thebesian valve (ThV) is present.

In 7 out of 15 horses the **middle cardiac vein (MCV)** drains directly into the RA, which means that two ostia were visible in the RA: **the coronary sinus ostium (CSo)** and the **middle cardiac vein ostium (MCVo)**.

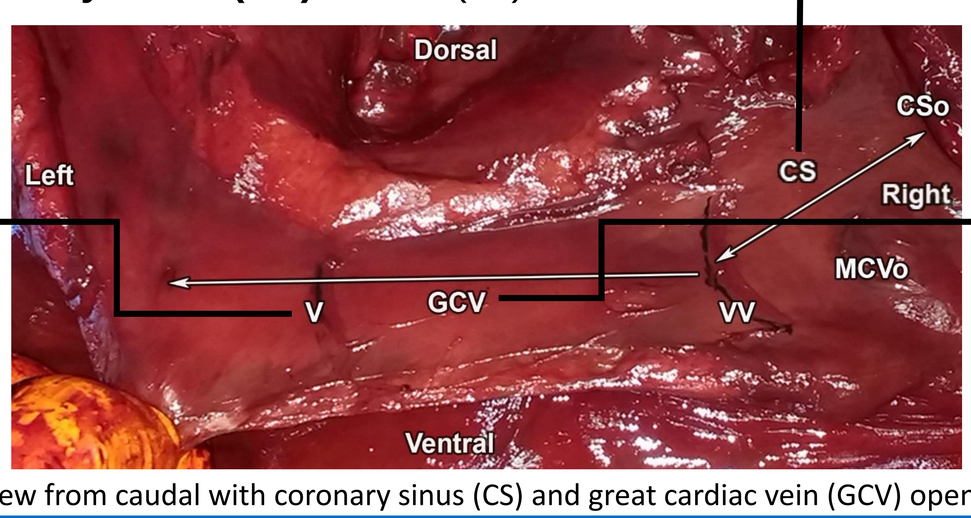
The coronary sinus ostium (CSo) was 28(±3) mm. A **Thebesian valve (ThV**), was only present in 3 horses.

The Vieussens valve (VV) forms the anatomic landmark between the **great cardiac vein (GCV)** and the **coronary sinus (CS)**. The length of the **coronary sinus (CS)**, measured between **coronary sinus ostium (CSo)** and the **Vieussens valve (VV)** was 45(±11) mm. The mean diameter of the **coronary sinus (CS)** was 14(±4) mm.



RA free wall opened; coronary sinus (CS) and middle cardiac vein (MCV) drain separately into the RA.

The median total number of **additional valves (V)** over the entire length of the **great cardiac vein (GCV)** was 5, ranging from 1 to 8, each with 2 to 3 cusps.



View from caudal with coronary sinus (CS) and great cardiac vein (GCV) opened.

Length of **great cardiac vein (GCV)** from **Vieussens valve (VV)** until the most apical point of the LV was 45.5(±1.2) cm, of which 18.5(±9.5) cm was located in the atrioventricular groove.

Conclusion

The large size of the intervenous tubercle in horses, due to the sharp angle between cranial vena cava and caudal vena cava, is likely to hamper transseptal puncture through the oval fossa via a cranial vena cava approach.
Catheterisation of the coronary sinus and great cardiac vein might be difficult due to presence of the Thebesian valve in some horses, and especially the large number of additional valves over the entire length of the great cardiac vein in all horses.