

## THE CORONARY SINUS AND THEBESIAN VALVE IN CARDIAC MAGNETIC RESONANCE

**Introduction:** Cardiac magnetic resonance (CMR) can potentially be useful in visualizing the coronary venous system before cardiac resynchronization. **The aim** was to evaluate the usefulness of CMR in the evaluation of the coronary sinus including the Thebesian valve (ThebV) - which protects the coronary sinus.

**Methods:** 63 patients aged  $48,6 \pm 17,2$  (23 W) were included into the trial. All magnetic resonance examinations were performed by using a GE Optima MR450w 1.5T with GEM Suite with a dedicated cardiac coil GE body 3D small cardiac. A steady state free precession (SSFP; FIESTA/45) sequence was the basis of the visualization and analysis of the coronary sinus as well as Thebesian valve. All data were evaluated by two CMR investigators. The ThebV was analyzed based on the modified CT classification.

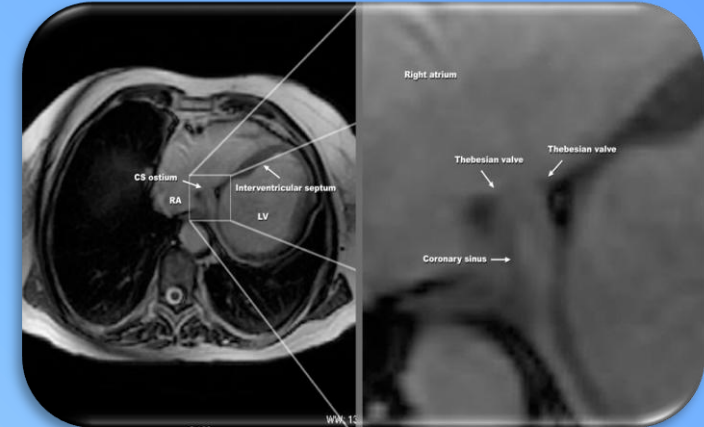


Figure A – Example of the anatomy of the coronary sinus with a visible Thebesian valve in CMR/ FIESTA (type C – Thebesian valve is built from two separate parts. There is a gap between parts.) RA – right atrium / LV – left ventricle / CS – coronary sinus



**Results:** We were able to visualize the coronary sinus using the basic SSFP sequence in all of the patients. Average length of the coronary sinus was  $37.6 \pm 13.4$ mm, average diameter was  $8.8 \pm 3.7$ mm and average angle of the entrance coronary sinus into the right atrium was  $110.1 \pm 13.1^\circ$ . The ThebV was found in 24 cases (52.2%).

The most frequent variant of the ThebV (37.5%) was the “D” variant in which a significant part of the ostium is covered by the valve. We also found the following types: “A2” - the semi-lunar membrane is visible from the atrium wall and covers more than 50% of the CS ostium (20.8%); “A1” - covers less than 50% of the CS ostium (16.6%); “E” - the membrane is porous so only the border between areas is visible (12.5%) and “C” - the valve is built from two separate parts with a gap between the parts (12.5%).

**Conclusions:** It is possible to visualize and measure the coronary sinus and the Thebesian valve using cardiac magnetic resonance with SSFP sequences.

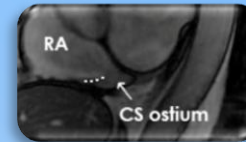


Figure B – Additional CS sequence

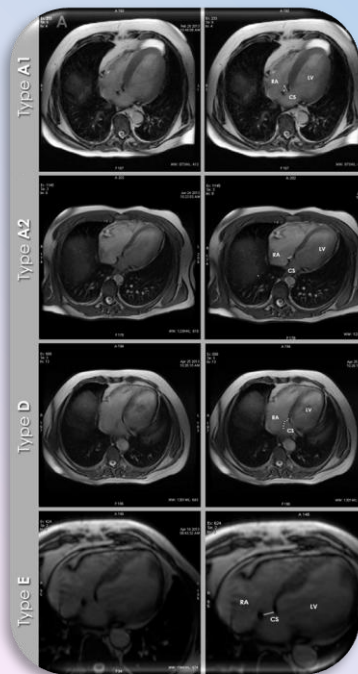


Figure C – Examples of various types of Thebesian valves in CMR/ FIESTA (RA – right atrium / LV – left ventricle / CS – coronary sinus)

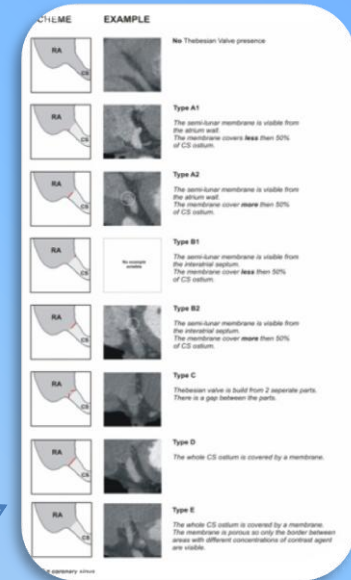


Figure D – Tomographic (MSCT) classification of Thebesian valve