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Native T1 mapping in adolescent patients with repaired tetralogy of Fallot – Preliminary Results

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ESPR
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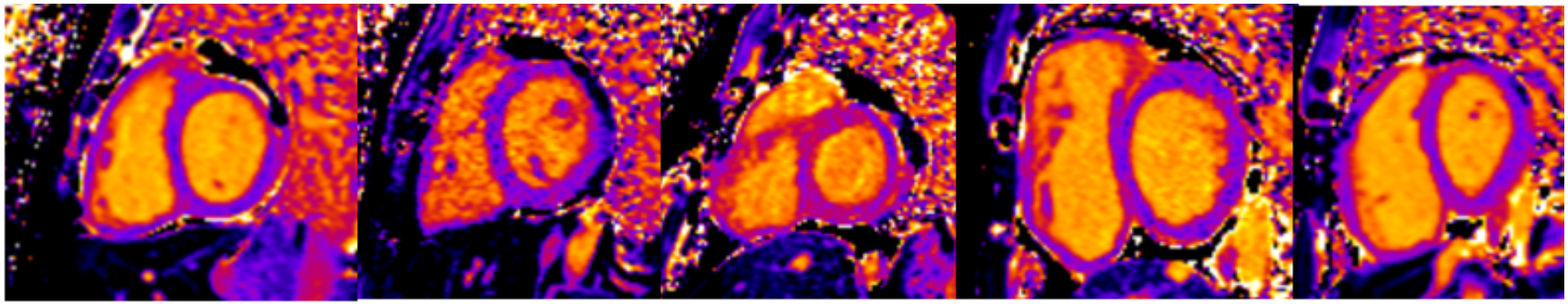
Disclosure

In relation to this presentation

I declare that there are no conflicts of interest.

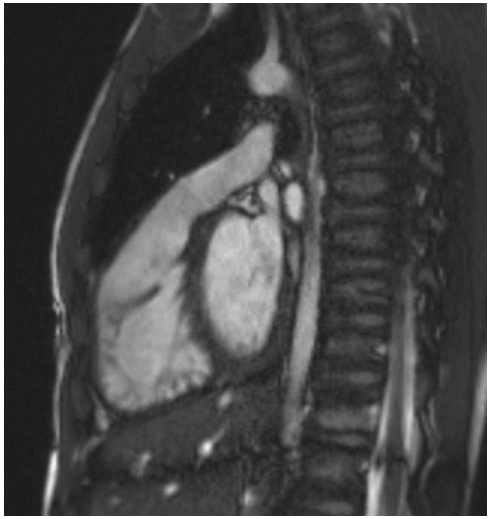
Purpose

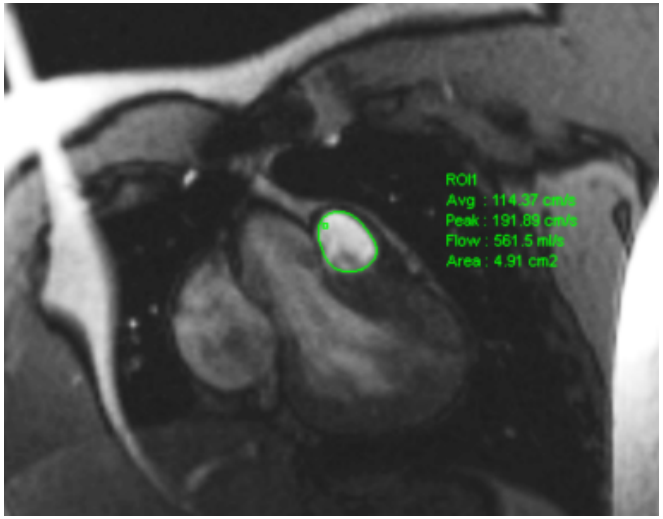
- Right ventricular fibrosis is an important risk factor in patients with repaired TOF as it leads to RV dysfunction or even RV failure.
- Native T1 mapping is a tissue characterization method to detect diffuse myocardial fibrosis.
- The purpose of this study was to evaluate the relationship between structural and functional/hemodynamic patterns in adolescent patients with repaired TOF by cardiac magnetic resonance (CMR).



Material and Methods

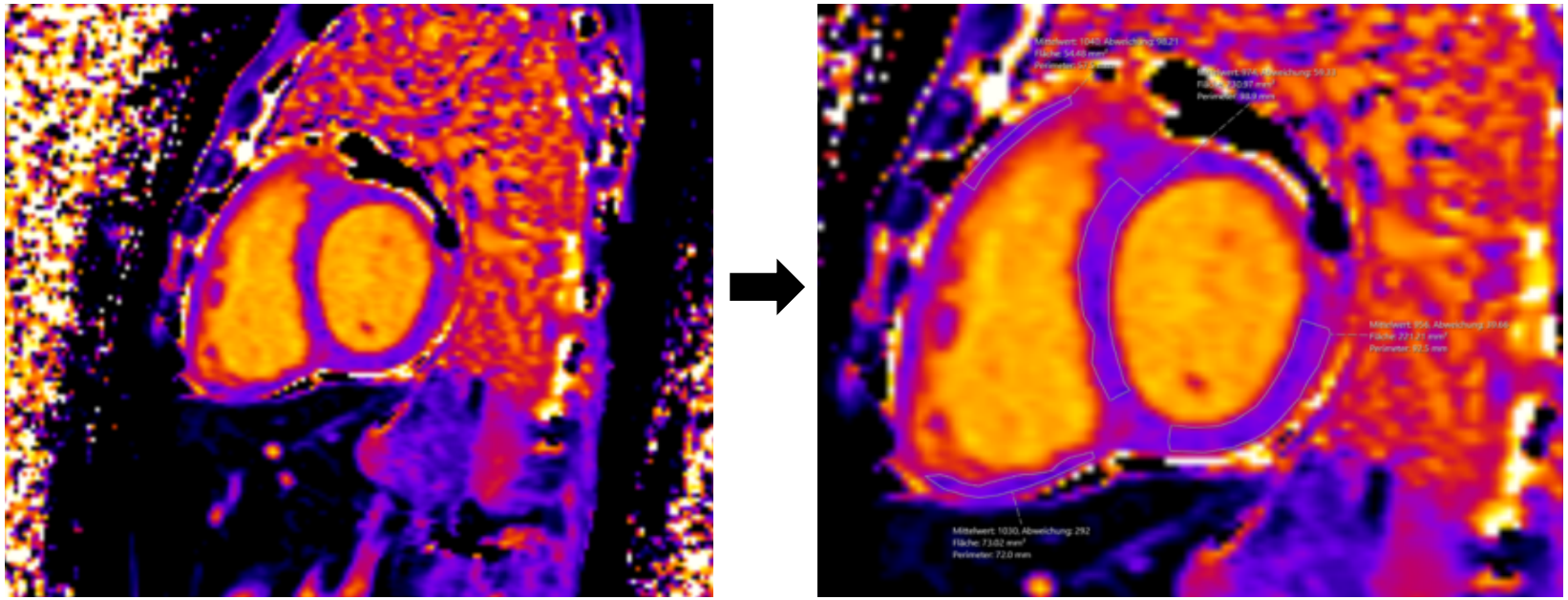
- So far, 5 male adolescent patients with repaired TOF, age 15 ± 3 years, underwent cardiac MRI at 1.5 T.
- The RV and LV function as well as the indexed right and left ventricular end-diastolic volumes (RV EDVi and LV EDVi) were calculated.
- 2D flow measurements were performed in the main pulmonary artery.



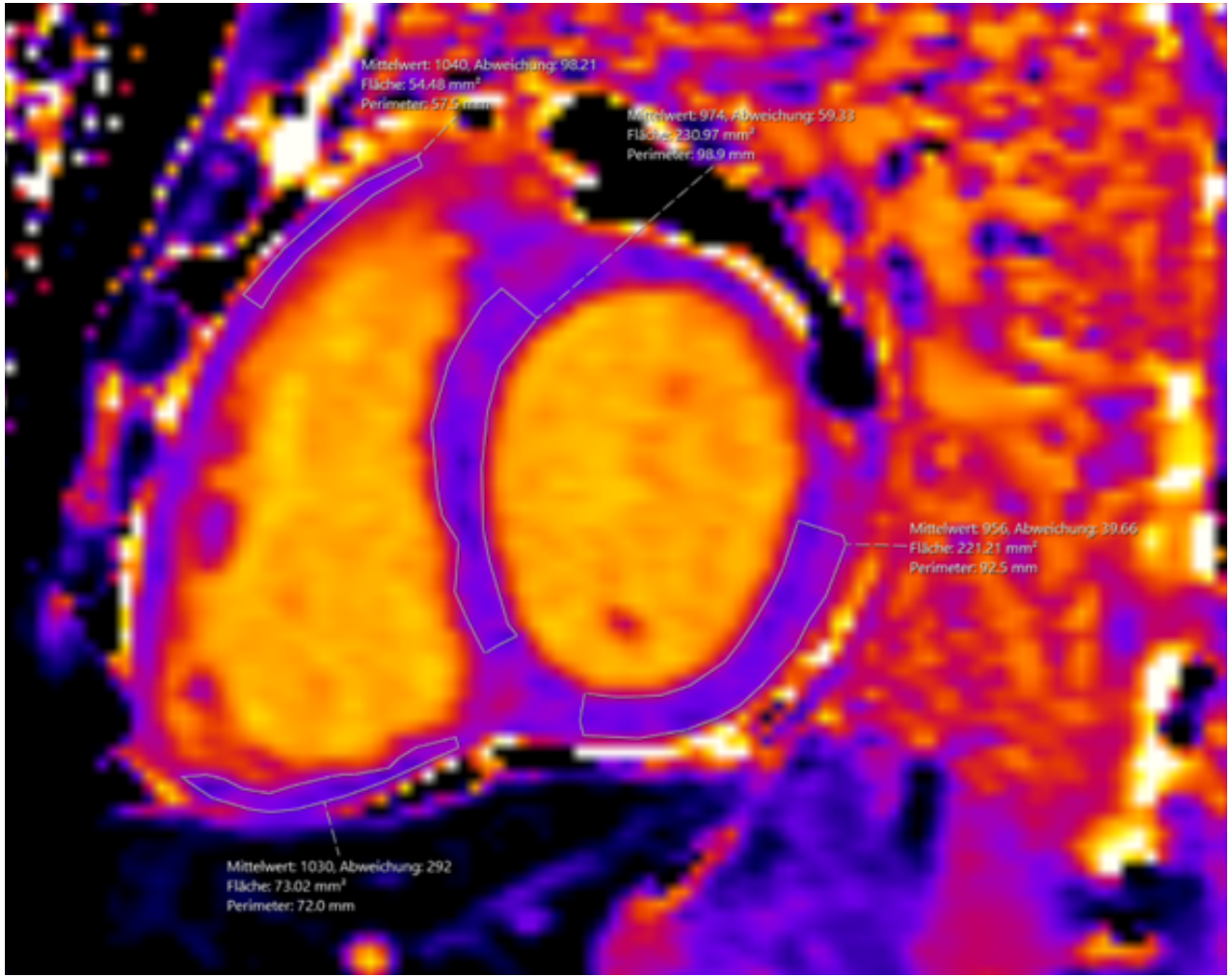


Material and Methods

– Native LV and RV T1 times were obtained for the RV outflow tract, the RV free wall, the LV septum and the LV free wall using a modified look-locker inversion recovery (MOLLI) sequence.

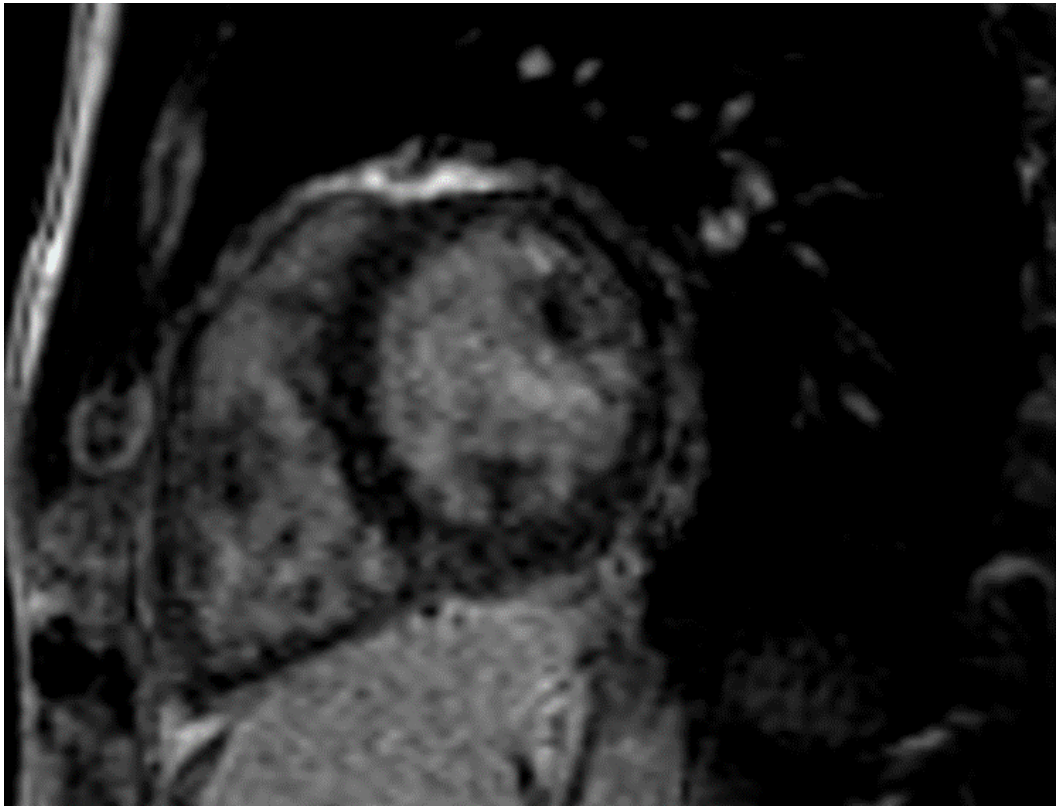


Material and Methods



Material and Methods

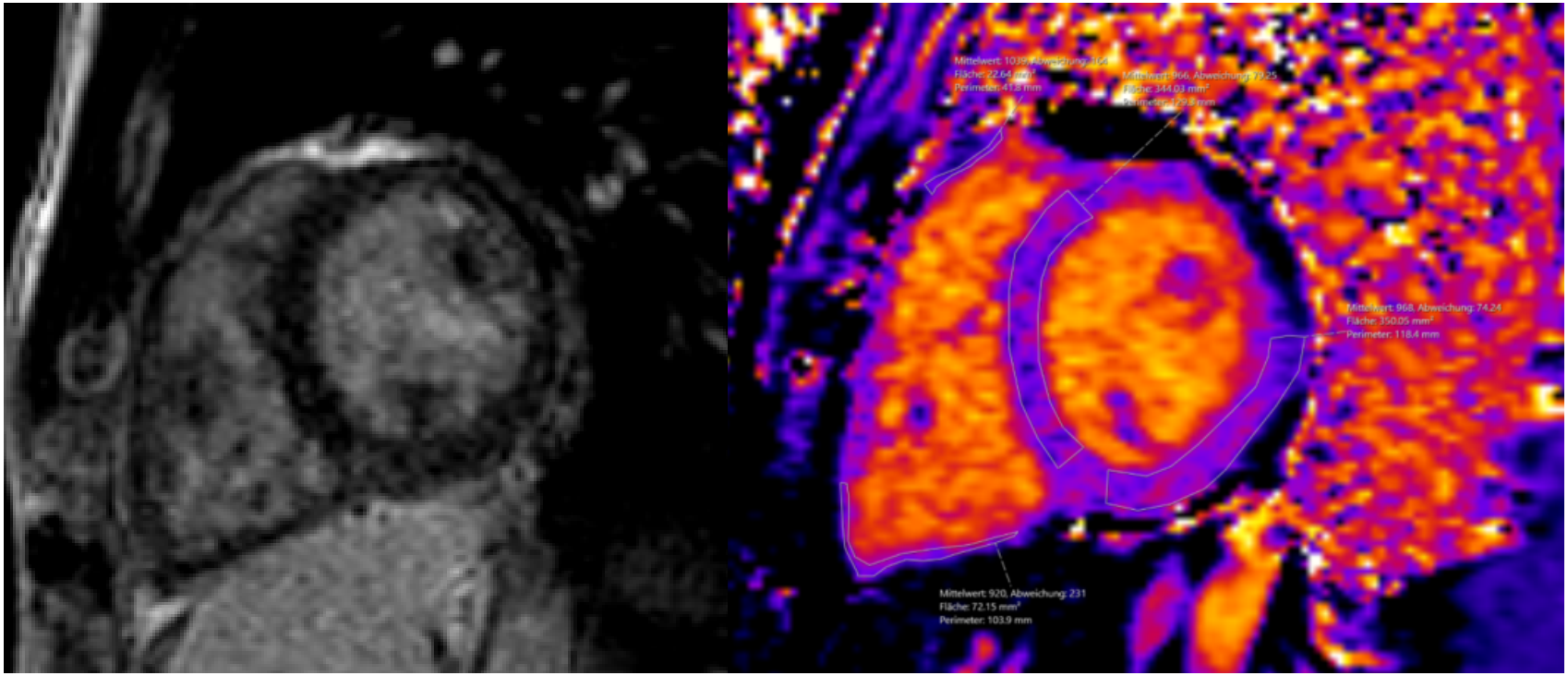
– Late Gadolinium Enhancement was performed as a reference standard.



Results

	1	2	3	4	5	mean + SD
age [y]	13	18	15	18	11	15 ± 3
sex	m	m	m	m	m	
RV EF [%]	51	41	41	38	27	39,6 ± 8,6
RV EDVi [ml/cm²]	86	57	74	103	162	96,4 ± 40
LV EF [%]	61	53	56	51	42	52,6 ± 7
LV EDVi [ml/cm²]	54	40	49	69	75	57,4 ± 14
RF TP [%]	30	17	37	41	19	28,8 ± 10,6
peakFlow TP [cm/s]	165	168	169	199	190	178 ± 15

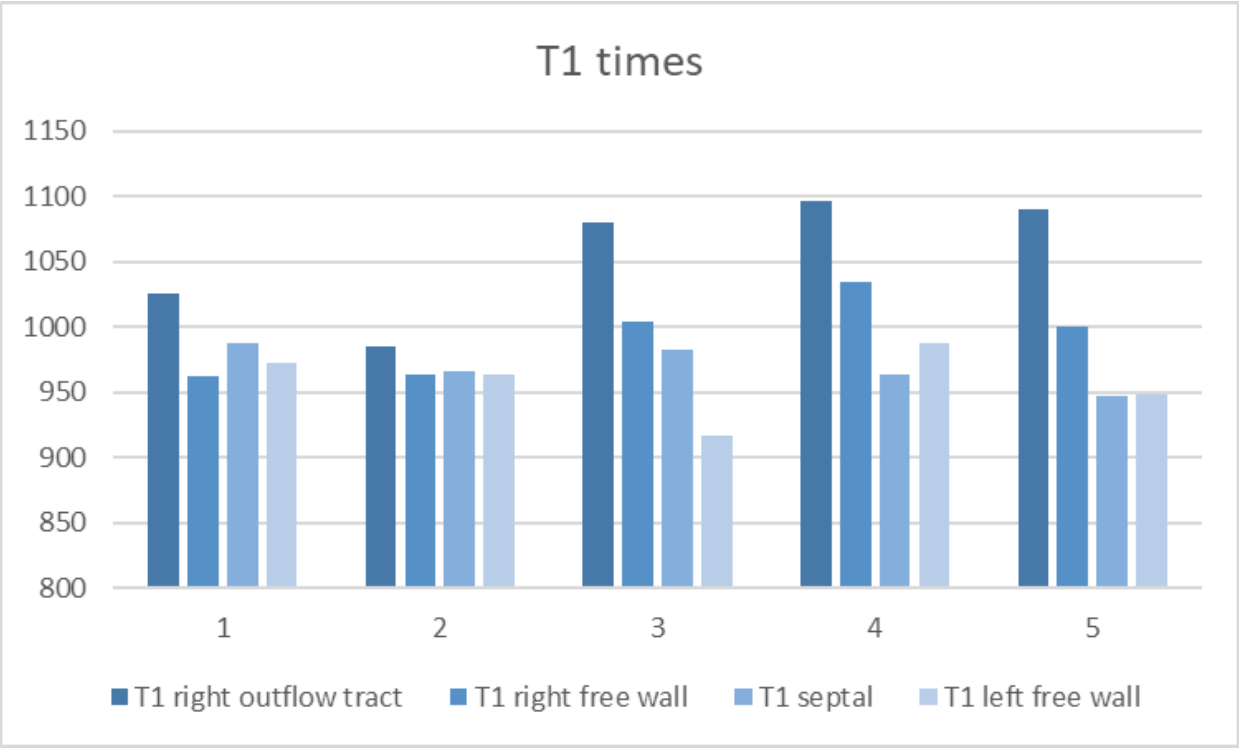
Results



LGE – no signs of fibrosis

T1 mapping – high values in the RVOT

Results



The highest T1 times were found in the RV outflow tract (1055 ± 48 ms).

There were significant differences in the mean native T1 times of the right and left ventricle ($p < 0,05$).

Results

Correlation with flow patterns and normalized EDV

High correlations between mean native T1 times of the right ventricle and maximum flow velocities (r = 0,79) as well as the pulmonary regurgitation fraction (r = 0,61, p < 0,05).

Mild correlation between mean native T1 times of the right ventricle and the indexed right ventricular end-diastolic volumes (r = 0,57, p < 0,05).

No correlation between mean native T1 times of the left ventricle and the indexed left ventricular end-diastolic volumes (r = - 0,12, p < 0,05).

Conclusion

- Native T1 mapping in adolescent patients with repaired TOF shows diffuse myocardial fibrosis, particularly in the RVOT.
- This diffuse fibrosis could not be detected by Late gadolinium enhancement assessment.
- Higher native T1 times of the right myocardium are associated with pathologic flow patterns in the pulmonary artery and the dilatation of the right ventricle.
- No signs of fibrosis were found for the left ventricle.

References

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