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Anatomic and Hemodynamic MRI Characteristics of Partial Anomalous Pulmonary Venous Return (PAPVR) with or without Sinus Venosus Defect (SVD)

Konen, E¹; Goitein, O²; Hamdan, A¹; Di-Segni, E¹

¹Sheba Medical Center, Ramat Gan, Israel; ²Sheba Medical Center, Ramat Gan, Israel

PURPOSE

To characterize the typical anatomic and hemodynamic findings in patients with PAPVR with and without SVD undergoing cardiac MRI

METHOD

During a 4-year period 16 patients with PAPVR were referred to our cardiac MRI unit. Scans were analyzed for the presence of an associated SVD, Lt/Rt ventricular volumes and function, Qp/Qs using phase contrast technique, anatomy of the remaining pulmonary veins, and the number and level of anomalous veins to SVC.

RESULTS

Six patients were referred with a questionable RVD, consisting 2.7% of a total of 224 patients referred for questionable RVD during the given period. Patients with a significant shunt (Qp/Qs \geq 1.5) showed an averaged 98% increase in RVEDV above the normal body surface area - corrected volume. RV ejection fraction was preserved in all patients (average 54%). Although in 14/16 of patients the RUL vein was missing on the LA wall, in 8 cases a small vein could be delineated draining independently the RML into the LA.

Nine patients had an associated SVD: when compared with patients without SVD (n=7), these patients showed a higher degree of shunt (average Qp/Qs = 2.5 Vs 1.7), a higher frequency of two abnormal pulmonary veins (4/9 Vs. 1/7) and a lower level of connection to the SVC in relation to its junction with the right atrium (average 14mm, range 6-20mm Vs. average of 27mm, range 20-35mm)

CONCLUSION

The presence of more than one abnormal pulmonary vein and a low level of drainage into the SVC (\leq 20mm) should increase the suspicion for an associated SVD and a significant L-to-R shunt