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Accuracy of gadolinium-enhanced 3-dimensional magnetic resonance angiography to detect venovenous collaterals in patients with total cavopulmonary connection (TCPC).

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Introduction: In patients with total cavopulmonary connection (TCPC), venovenous collaterals may cause cyanosis and haemodynamic impairment. The aim of the study was to evaluate the accuracy of gadolinium-enhanced 3-dimensional magnetic resonance angiography (GE 3D MRA) to detect these abnormal vessels.

Methods: From January 2010 to December 2011, 13 patients (median age 16 years, range 12 to 28) with TCPC underwent both GE 3D MRA and cardiac catheterization within a median of 6 months. Combined findings were compared.

Results: GE 3D MRA detected venovenous collaterals in 6/13 (46%) of the patients. Mean oxygen saturation was 93% in these patients. All the 8 major collaterals diagnosed in these patients by catheterization were correctly diagnosed by MRA. Compared to catheterization, GE 3D MRA had 100% sensitivity and specificity for the diagnosis. All the collaterals were closed using coils, plugs and covered stents and mean oxygen saturation increased to 97%.

Conclusions: GE 3D MRA is fully accurate to detect venovenous collaterals after TCPC. This technique might reduce the irradiation exposure in the cath lab, might reduce the total amount of the contrast injected and might orient the procedure of percutaneous closure.