Cardiology in the Young

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Commentary on the paper by Gottschalk et al.

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Letter to the Editor

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I read the article by the authors of the article entitled "The importance of evaluating anatomy below the diaphragm in staged single-ventricle patients presenting with cyanosis" with great interest.[1] As the authors themselves state, venous-venous collaterals in patients after Fontan surgery are a relatively common complication that exacerbates the already present cyanosis. Cyanosis, whether due to angiogenesis or the opening of pre-existing collateral vessels from the fetal period, acts as a driving factor for their formation and worsens the survival of this group of patients.

Venous-venous collaterals are predominantly observed in the chest region, although there are documented instances where they stem from abdominal vessels. The paper's title suggests that paediatric cardiologists often concentrate exclusively on the chest, neglecting the abdomen. This is evidenced by the partial capture of venous-venous collaterals in advanced examination techniques.

Porto-systemic or porto-caval shunts can also occur in patients post-Fontan surgery. These are associated with hyperammonemia, which bypasses the liver's filtering function and can lead to brain damage. Conversely, the hepatic factor does not reach the lungs, resulting in arteriovenous fistulas that exacerbate cyanosis. Current standard practice for monitoring patients post-Fontan surgery involves advanced radiological imaging techniques, specifically cardiac MR or CT angiography.

MR examination protocols should include screening sequences for abdominal examination. The Liver Acquisition with Volume Acceleration sequence, for instance, can help detect potential veno-venous collaterals originating from the abdominal area or porto-caval connections (Figure 1). Similarly, CT examinations should also include imaging of the abdominal area.

Examination of the abdominal region aids in planning catheterisation interventions for collateral or shunt formations. Furthermore, it is beneficial to include a routine blood ammonia level test in the examination protocol, as hyperammonemia may necessitate abdominal imaging to identify portacaval shunts.

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Figure 1. MRI Liver Acquisition with Volume Acceleration sequence in Fontan patient with portorenal shunt (yellow arrowhead).

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Reference

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