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Stent Fenestration of the Failing Fontan Circulation – a single centre experience

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Introduction: Elevated systemic venous pressures after Fontan completion are a risk factor for early or late complications or failure. Fenestrations allow for off-loading of the Fontan circuit and can provide relief of symptoms. Catheter creation of diabolos stent fenestrations was introduced at BCH in 1998.

Setting: Retrospective case review of patients who underwent stent fenestration of a Fontan circulation over a 10 year period at a single institution.

Patients and Methods: Thirty-four patients underwent transcatheter stent fenestration 1 day – 10 years (median 22 days) after Fontan completion. De-novo fenestrations were created in 16 patients using either the stiff end of a guidewire or a Brockenborough needle. Median age was 5.5(3.4-14.1) years and median weight 17 (11.5-63) kg. Seven patients underwent concomitant LPA stenting.

Results: Three patients underwent stent fenestrations for LCOS within 5 days of operation as an alternative to Fontan take-down – all three survived. Twenty-one were treated for prolonged pleural effusions with resolution within a median of 10 days. Five patients each underwent creation of stent fenestration for bronchial casts or PLE late post Fontan with resolution of symptoms after a mean of 3.5 (2-6) months. Overall Fontan pressures decreased from mean 18.5 to 16 mmHg ($p < 0.001$) and saturations decreased from 93% to 81% ($p < 0.001$). All diabolos stents remained patent over the F/U period.

Conclusion: Stent fenestration of the failing Fontan circulation provides good symptomatic relief and a significant drop of Fontan pressures at the cost of systemic desaturation. Long-term patency of the diabolos stent is excellent.