Brachial arterio-venous fistula for the palliation of complex cyanotic CHD

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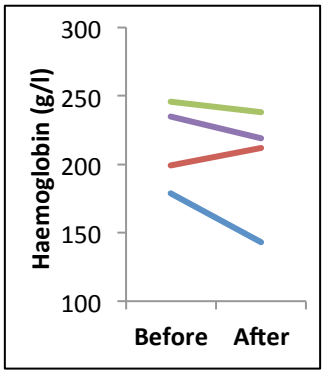
Introduction

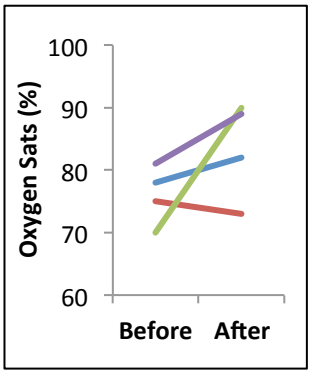
The options for improving systemic oxygenation in patients with complex cyanotic congenital heart disease (CCCHD) are a PDA stent, an atrial-septal stent, Glenn shunt, BT shunt or creation of an aorto-pulmonary connection. Creation of a peripheral arterio-venous fistula (AVF) is an infrequently employed option, which increases pulmonary blood flow by 600-1300%.[1] It has been shown to be safe, can improve symptoms, haemoglobin and O_2 sats.[2-7]

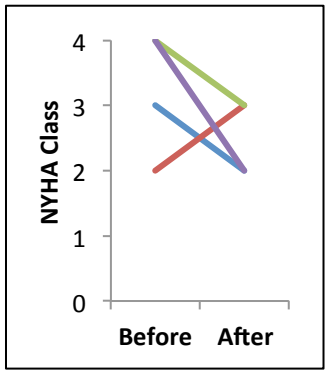
Methods

This is a retrospective analysis from a large UK congenital centre, describing 4 patients with CCCHD, who had previously undergone palliative surgery creating a bi-directional or classic Glenn shunt. All patient had an AVF fashioned in the last 6 years for progressive dyspnoea, fatigue or cyanosis. The mean follow-up duration was 28 months post AVF and haemoglobin, O_2 sats and NYHA were recorded at clinic follow up.

Author	Year	n =	Follow-up	Outcome	Ref
Mitchell	1989	5	2.5 years	Symptoms	2
Magee	1996	11	7.4 years	Hb/O_2 Sats	3
Hickey	2010	21	11 years	Symptoms	4
Quinonez	2011	11	2.8 years	Hb/O_2 Sats	5
Quarti	2011	6	1.3 years	Hb/HCT	6
Chanana	2015	23	N/A	O_2 Sats	7







Patients								
Age	Gender	Diagnosis	Haemoglobin (g/L)	Creatinine (umol/L)	Rest O_2 sats (%)	NYHA Class	BMI (kg/m^2)	AV regurgitation
59	F	Tricuspid atresia, VSD	170	152	78	3	22	Mild
21*	M	AVSD, DORV	199	73	75	2	18	Severe
25^	M	Mitral atresia, DORV, TGA	246	75	70	4	19	Moderate
28	M	Mitral atresia, DORV, TGA, CoA	235	72	81	4	25	Trivial

Results

One patent received a brachio-cephalic AVF and all others a brachio-basilic AVF. Three patients had a sustained symptomatic improvement, with a corresponding increase in O_2 sats, decrease in haemoglobin and in NYHA class. Complications were reported in two patients, including ventricular overload* & arterial steal syndrome^ and in both cases, the AVF needed to be revised or banded to restrict flow.

Conclusions

An AVF is a consideration for symptomatic patients with CCCHD and limited treatment options. In this small case series, an AVF may improve systemic oxygenation/symptoms. Although, this is a relatively simple, low risk intervention, there are potential risks. It is difficult to predict those who may benefit or may experience complications from this intervention.

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