Transhepatic cardiac catheterisation in children: What have we learnt?

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AIM. To describe our experience in cardiac catheterisation in children via transhepatic approach where conventional venous access is impossible.

PATIENTS AND METHODS. Percutaneous transhepatic cardiac catheterization was performed on twelve occasions (2006-2012) in ten children aged 1 to 64 months (mean 12 months). Patient weight ranged from 3 to 16 kilograms. All children had documented bilateral femoral venous occlusion. Patient diagnosis were: univentricular heart (n=5), pulmonary atresia with ventricular septal defect (n=1), pulmonary vein stenosis (n=2), atrial septal defect (n=1) and cardiac transplant (n=1). One patient was assisted with extracorporeal membrane oxygenation.

A 21 G and 4 cm long needle was used, introduced under fluoroscopy guidance. A 4F to 6F sheath was inserted into the hepatic vein using the Seldinger technique. To minimize risk of bleeding the transhepatic tract was occluded with a vascular plug in three patients, with coils in one and with both a vascular plug and coils in two.

RESULTS. Percutaneous transhepatic catheterisation was successfully performed in all twelve attempts. The cathetization was diagnostic in seven children and interventional in five. A central venous catheter was placed in six patients: a port a cath was placed in one patient, a dialysis catheter (Shaldon catheter) in one patient, and an Arrow catheter was placed in the remaining (n=4). Interventional procedures included stent implantation in pulmonary veins (n=2), balloon angioplasty of pulmonary venous stenosis (n=1), occlusion of atrial septal defect (n=1), and balloon angioplasty of right pulmonary artery and stent implantation in left pulmonary artery (n=1). Ultrasound was performed 24 hours after transhepatic catheterization in seven patients. Peritoneal bleeding was encountered in one patient, resolved with conservative treatment; the coil implanted in the liver tract had embolized to the abdominal cavity.

CONCLUSIONS. Percutaneous transhepatic technique can provide a safe approach for cardiac catheterisation in children. In our experience, occluding the liver tract could minimize the risk of bleeding. This approach also allows for catheter implantation facilitating management of complex patients.