Transcatheter catheter closure of patent ductus arteriosus in small pediatric patients from an exclusive transvenous approach using combined angiographic and echocardiographic guidance

Thanopoulos B.D.(1), Ninios V.(1), Giannopoulos A.(2), Deleanou D.(3)
Agios Lukas Hospital, Thessaloniki, Greece (1); Ahepa University Hospital, Thessaloniki, Greece (2); Ares Clinic, Bucharest, Romania (3)

Introduction Transcatheter closure is the treatment of choice for the majority of patients with a patent ductus arteriosus (PDA). However, the standard technique of this procedure may be associated with arterial complications, particularly, in small pediatric patients. The aim of this study was to report experience with catheter closure of PDA in 33 consecutive small children using an exclusive venous approach.

Methods The age of the patients ranged from 6-36 months and the weight from 6-13 Kg. The anatomy and size of PDA were defined by transvenous retrograde aortography using a Pigtail or a Berman catheter. The PDA occluder was implanted through a 7 F (ADO I) and 5F (ADO II, ADO AS) delivery sheath (DS) in 10 and 23 patients, respectively. The procedure was guided using hand injections of contrast media through the DS and 2D and color Doppler echocardiography from suprasternal and parasternal long and short axis, respectively.

Results The PDA occluders were permanently implanted in all 33 patients. The mean PDA diameter (at the pulmonary end) was 3.8 ±0.9 mm (range, 2.5 to 5.2 mm). The mean device diameter was 5 ± 1 mm (range 4 to 6 mm) and 4.2 ± 1.5 (range, 3-6 mm) for the ADO I and the ADO II occluders. Complete echocardiographic closure of the ductus at 1-month follow-up was observed in all 33 patients (100%). Immediately after the procedure there was a mild left pulmonary stenosis (peak pressure gradient of ranging from 6-8 mm Hg), in 3 patients. Five minor groin hematomas were the only complications of the procedure.

Conclusions Exclusive transvenous PDA occlusion using combined angiographic and echocardiographic guidance is an effective and safe method that prevents the arterial complications of the standard approach in small children. In contrast to ADO I the ADO II, AS occluders due to their low profile can be delivered through a 5 F delivery sheath which facilitates crossing of PDA and the injections of contrast medium for guidance of the procedure.