

Implantation of the new Nit-Occlud PDA-R device in children below 10 kilograms

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Introduction:

Interventional closure of a patent arterial duct (PDA) has become a common and safe procedure in most pediatric cath labs. However, despite the modern devices available, it still remains a challenge in those children with low body weight and a large PDA. Several new PDA occluder systems have been developed in the last years. One of them is the Nit-Occlud PDA-R device which was especially designed for large PDAs. The clinical experience and initial trial [1] with this occluder published so far accepted only children with a body weight greater than 10 kilograms.

Methods:

We report our most recent experience in five children (age 6-33, mean 13.4 months) with a body weight from 5.4 to 13 kg (mean 9 kg) with large PDAs: ductal length was 14.6 mm (mean), there was a large ampulla (mean 12.8 mm) which exceeded the diameter of the aorta and large diameter of the duct (mid-PDA mean 6.8 mm, narrowest mean 3.6 mm).

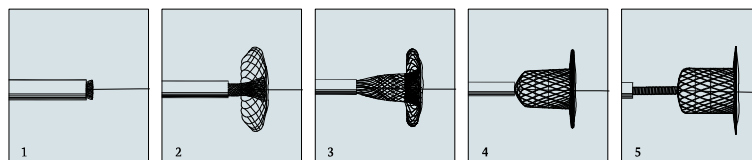
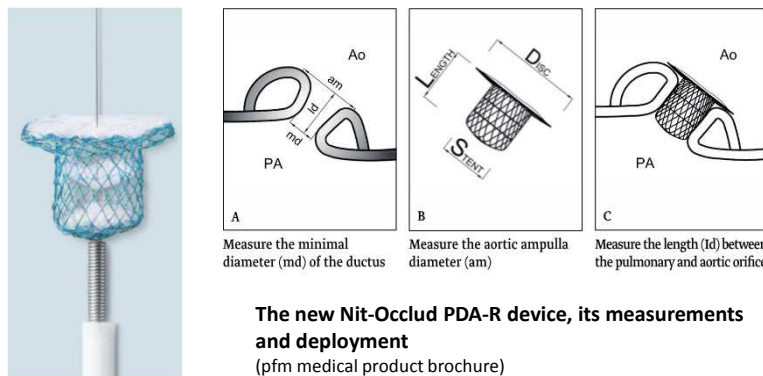
The occluder size is determined by the minimum diameter of the PDA, the occluder stent must be at least 1.5 times, better 2 times greater: in four cases, the Nit-Occlud PDA-R with an aortic disc of 12 mm, a stent of 7 mm and a length of 8.5 mm was selected and in the fifth case one with an aortic disc of 14 mm, a stent of 8.5 mm and a length of 9.5 mm. All devices were implanted using the femoral venous access with a 6F sheath.

Results:

All five devices were successfully implanted under sedation, without general anesthesia and without complications, e.g. dislocation with pulmonary or aortic obstruction. A sufficient occlusion of the PDA was documented by angiography and echocardiography in all cases. The patients were discharged from hospital two days after implantation.

Conclusion:

The new Nit-Occlud PDA-R device is suitable even in children with a body weight below 10 kilograms, when a relative large PDA is present. The re-inforced retention disc allows an optimal positioning in the aortic ampulla without obstruction or pulling through the duct and the flexible cylindrical plug helps to adapt this device to various duct anatomies.



Tab. 1: Patients and devices data

#	age (month)	weight (kg)	length (cm)	PDA min. diameter	PDA length	Device stent	Device length	venous sheath
1	10	5.4	62	4 mm	15 mm	7 mm	8.5 mm	6 Fr
2	7	9.7	90	4 mm	25 mm	7 mm	8.5 mm	6 Fr
3	33	13	92	3.5 mm	12 mm	7 mm	8.5 mm	6 Fr
4	11	11	86	2 mm	11 mm	7 mm	8.5 mm	6 Fr
5	6	5.9	63	4.5 mm	10 mm	8.5 mm	9.5 mm	6 Fr

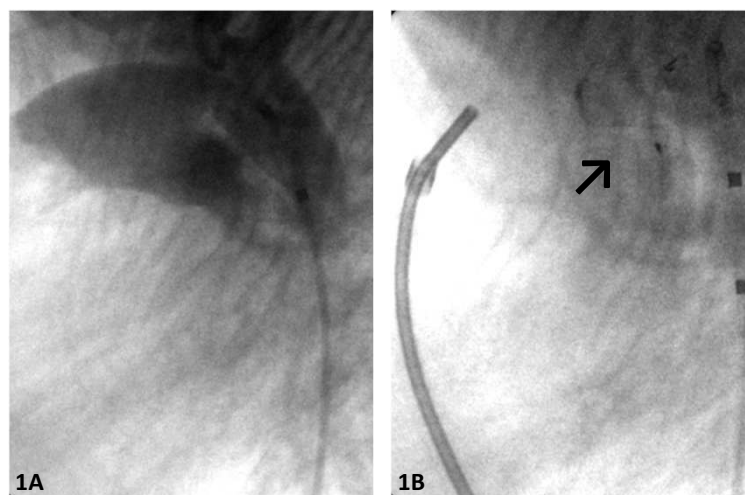


Fig. 1A: large duct in a 6 month old girl with a body weight of 5.9 kg
 Fig. 1B: PDA-R device in ductal position ↗ after releasing

Reference:

[1] Freudenthal et al., *Cardiol Young*. 2012 Apr;22(2):128-35.
 Chronic hypobaric hypoxia, patent arterial duct and a new interventional technique to close it

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