

# Percutaneous closure of atrial septal defect type II — a few remarks on the basis of my own experience

Przezskórne zamknięcie ubytku międzyprzedsionkowego typu II — kilka uwag na podstawie własnych doświadczeń

Jacek Białkowski

Congenital Heart Diseases and Paediatric Cardiology Department, Silesian Centre for Heart Diseases, Medical University of Silesia, Zabrze, Poland

I have read with great interest the clinical vignette article of Dr. Gutierrez-Barrios et al. [1] published in the July 2017 issue of "Kardiologia Polska". They described silent early migration of atrial septal defect type II (ASD) Figulla occluder into the left ventricle in a 61-year-old woman. I have a few remarks regarding this topic.

In our clinical practice we close percutaneously ASDs in children and adults (more or less 50/50%). Recently we performed a comparison of different nitinol wire mesh occluders suitable for ASD closure available in Europe. Between 1997 and 2016 in our centre 1321 patients had attempted percutaneous closure of ASD with six different devices possessing a CE mark. Their age ranged from 0.5 to 79 years, and weight from 6 to 121 kg. The application of different occluders was dependent on time (results of subsequent tenders). The procedures were successful in 1281 (97%) patients. Of these, 1013 patients received Amplatzer Septal Occluder (ASO), 87 Figulla occluder, 62 Cardio-O-Fix occluder, 27 Cera occluder, 31 Heart R occluder, and 61 Hyperion occluder (the latter four devices produced in China). In 40 patients the device was withdrawn because of

unfavourable ASD anatomy, which was confirmed during transoesophageal echocardiography. There were 1077 single ASDs and 204 double/multiple ASDs. There were eight early embolisations (during or immediately after the procedure) — seven ASOs and one Figulla — mainly in the early years of its usage, and no late embolisations. In the ASO group the age and weight of patients were lower and follow-up longer. Serious complications (such as wall erosion, fracture of the device, or thrombus formation) were only observed in one patient: after Figulla occluder application in the early postprocedural period a small ischaemic stroke occurred [2]. In late observations two patients developed complete atrio-ventricular block with the need for pacemaker implantation [3], and one developed late endocarditis due to incomplete endothelialisation [4] (all treated with ASO). The Figulla delivery system is 2–3 F bigger for the same size of device than ASO. This fact is very important when we apply devices in small children. Our policy is to close ASDs even in children less than four years old (traditional indication > 4–5 years old), when symptoms are present (failure to grow, frequent respiratory infections, circulatory insufficiency,

Table 1. Some clinical and procedural data of six different types of nitinol wire mesh occluders

Implant type	No. of patients	Age [years] (mean)	Weight [kg] (mean)	ASD in TEE [mm] (mean)	Implant size [mm] (mean)	Fluoroscopy [min] (mean)
Amplatzer	1013	21 (0.5–77)	44.4 (6–119)	12.8 (3–34)	18.1 (4–40)	5.0 (1–39)
Figulla	87	35 (3.4–79)	68.5 (19–121)	16.7 (6–33)	22.9 (12–39)	4.3 (1–13)
Cardio-O-Fix	62	27.3 (2.5–72)	55.5 (14–103)	13.6 (7–22)	19 (9–30)	3.6 (0.8–11.4)
Cera/Heart R	27 / 31	34.6 (5–74)	59.2 (18–107)	14 (5–26)	18.3 (10–30)	3.6 (1–9.3)
Hyperion	61	28.5 (5.2–77)	57.2 (17–117)	13.2 (4–26)	17.9 (9–34)	3.2 (0.5–11.5)

ASD — atrial septal defect type II; TEE — transoesophageal echocardiography

#### Address for correspondence:

Prof. Jacek Białkowski, Congenital Heart Diseases and Paediatric Cardiology Department, Silesian Centre for Heart Diseases, Medical University of Silesia, ul. M Curie-Skłodowskiej 9, 41–800, Zabrze, Poland, e-mail: jabi\_med@poczta.onet.pl

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others) or when the parents of the child insist on such treatment (a more and more frequent phenomenon). In such a manner, we prevent dilation of right heart chambers and subsequent rhythm disturbances. Our experience indicates that percutaneous closure of ASD is feasible also in infants [5], but we have to remember that spontaneous closure of even large ASD can occur [6]. Thus, our policy now, when we have made diagnosis of ASD in small child, is to follow its diameter by echocardiography evaluation to exclude the possibility of spontaneous closure.

Our paper about the comparison of different nitinol wire mesh ASD devices was presented during the AEPC Annual Meeting in Rome on June 2<sup>nd</sup> 2016 [7]. Table 1 is showing some details of the investigated groups. The conclusion from this investigation was that the application of all types of mentioned above nitinol wire mesh occluders for ASD closure is safe and has similar effectiveness. The advantage of the smallest sheath makes the Amplatzer optimal in the closure of ASD in small children.

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## References

1. Gutierrez-Barrios A, Lacial-Pena JM, Vignau-Cano JM, et al. Silent early migration of a Figulla® septal occluder into the left ventricle. *Kardiol Pol.* 2017; 75(7): 774, doi: [10.5603/KP.2017.0130](https://doi.org/10.5603/KP.2017.0130).
2. Heredia JD, Szkutnik M, Fiszer R, et al. Early neurological complications after transcatheter closure of atrial septal defect with nitinol wire mesh occluder. *Kardiol Pol.* 2013; 71(9): 957–959, doi: [10.5603/KP.2013.0233](https://doi.org/10.5603/KP.2013.0233), indexed in Pubmed: 24065426.
3. Szkutnik M, Lenarczyk A, Kusa J, et al. Symptomatic tachy- and bradyarrhythmias after transcatheter closure of interatrial communications with Amplatzer devices. *Cardiol J.* 2008; 15(6): 510–516, indexed in Pubmed: 19039754.
4. Białkowski J, Pawlak S, Banaszak P. Incomplete endothelialisation of an Amplatzer Septal Occluder device followed by meningitis and late acute bacterial endocarditis. *Cardiol Young.* 2016; 26(4): 808–810, doi: [10.1017/S1047951115002383](https://doi.org/10.1017/S1047951115002383), indexed in Pubmed: 26707128.
5. Knop M, Szkutnik M, Fiszer R, et al. Transcatheter closure of atrial septal defect in children up to 10 kg of body weight with Amplatzer device. *Cardiol J.* 2014; 21(3): 279–283, doi: [10.5603/CJ.a2013.0120](https://doi.org/10.5603/CJ.a2013.0120), indexed in Pubmed: 23990191.
6. Fiszer R, Szkutnik M, Chodór B, et al. Spontaneous closure of a large atrial septal defect in an infant. *Postepy Kardiologii Interwencyjnej.* 2014; 10(4): 264–266, doi: [10.5114/pwki.2014.46768](https://doi.org/10.5114/pwki.2014.46768), indexed in Pubmed: 25489320.
7. Szkutnik M, Fiszer R, Zyla-Frycz M, et al. Comparison of efficacy and safety of 6 different types of nitinol wire mesh occluders in 1321 patients with atrial septal closure. 50 Annual Meeting of the AEPC, Rome 2016, Programme Book, p. 40, Abstract MP 2–8.

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