Use of an Amplatzer Vascular Plug to occlude a tubular type of patent ductus arteriosus

Eun-Young Choi, M.D., So-Ick Jang, M.D. and Soo-Jin Kim, M.D.

Department of Pediatrics, Sejong General Hospital, Bucheon, Korea

= Abstract =
Patent ductus arteriosus (PDA) is a common congenital heart defect. All PDAs, regardless of size or degree of symptoms, require occlusion. Transcatheter PDA occlusion features fewer complications than trans-thoracic closure. It is also more cost-effective and has an excellent occlusion rate. Therefore, transcatheter PDA occlusion is accepted as the standard treatment option for PDA. However, tubular-type PDAs are difficult to close with ordinary detachable coils or the Amplatzer Duct Occluder; thus, these lesions remain a challenge for transcatheter closure. We attempted to occlude a tubular-type PDA by using an oversized Amplatzer Vascular Plug, which allowed intraluminal packing of the ductus. By using this treatment method, PDA occlusion was achieved safely with an excellent final outcome. We suggest that this approach may be a good option for transcatheter closure of a tubular-type PDA. (Korean J Pediatr 2009;52:1035-1037)

Key Words: Ductus arteriosus, Patent, Heart Catheterization, Device
Fig. 1. A) Initial angiography revealing a long tubular PDA with 2.5–3.1 mm width and 10.5 mm length. B) After positioning of the 4-mm Amplatzer Vascular Plug®, there was significant PDA flow through the device. C) A 6-mm Amplatzer Vascular Plug® completely packed a tubular-type PDA, and there was no residual PDA flow.

Discussion

PDA is one of the most common congenital cardiac defect. There is no controversy about recommending closure of all PDAs, regardless of their size or severity. Small PDAs, less than 2 mm, are generally closed with detachable embolization coils. Detachable coils have many advantages in such that they can be placed by using a smaller sheath, they are easy to reposition and they have a low rate of complication as well as a low cost. On the other hand, an ADO is a preferable device for larger PDAs more than 4 mm in size. The ADO comes in various sizes and it has an excellent occlusion rate. Unfortunately, there are wide variety of size and shapes of PDA, so no one device is optimal or applicable for all PDAs. The tubular-type PDAs, especially, are still a challenging entity for the interventional cardiologist. In these cases, ADO is not suitable and the use of coils bears a high risk of complications such as residual leakage or embolization of the coil. In spite of the use of AVPs on a large scale, some reports have claimed that the use of an AVP is contraindicated for the large tubular-type of PDA. In this case, we tried using a larger size of AVP than is generally recommended and that brought about packing of the PDA. An AVP is a self-expanding, cylindrical device that is made out of nitinol wire mesh and unlike other Amplatzer occlusion devices, it has no occlusive fabric. Therefore it has previously been considered unsuitable for embolization of high flow lesions such as PDA. According to our experience with the tubular-type PDA, especially those with a narrow pulmonic end, AVPs may be a reasonable option in carefully-selected cases.

Acknowledgments

The authors would like to express appreciation to physician assistant Young-Hee Shim and Yun-Hui Han, who worked so hard to make this report.
Use of an Amplatzer Vascular Plug to occlude a tubular type of patent ductus arteriosus

한글 요약
원통형 모양 동맥관의 경피적 폐쇄술에서의 Amplatzer Vascular Plug의 사용
부천세종병원 소아청소년과
최은영 · 장소익 · 김수진
등맥관 개존증은 선천성 심질환 중 비교적 흔한 질환이며, 크기나 중등도에 상관없이 폐쇄가 필요한 질환이다. 경피적 동맥관 폐쇄술은 개흉술에 비하여 합병증의 위험이 적고 경제적으로도 바람직하며, 치료 성적이 우수하여 최근에는 표준적인 치료법으로 받들여지고 있다. 하지만 원통형 모양의 동맥관 개존증은 혈행사용하는 분리형 코일이나 ADO로 시술하기에는 여러 가지로 어려운 점이 많다. 저자들은 이러한 형태의 동맥관을 폐쇄하기 위하여 일반적으로 추천되는 것보다 큰 크기의 AVP를 이용하여 원통형 동맥관이 메워지고도록 하는 방법을 이용함으로써, 성공적인 동맥관 개존증 폐쇄술을 시행하였기에 이를 보고하는 바이다.

References