

Editorial Comment

Does a “Split” Stent Make Sense?

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In the preceding article, Ewert et al. [1] describe a technique in which they implant in piglets stents that have been split longitudinally. The sides of the stent were reattached using absorbable sutures that, when absorbed, allow for further expansion of the stents. These modified stents were placed in normal inferior venae cavae, descending aortae, or pulmonary arteries through a 5 Fr sheath. The animals were recatheterized 14–23 weeks later. In no instance was a pressure gradient recorded across the stented vessel segment. In 10 of 20 stents, there was angiographic appearance of narrowing of no more than 10% of the vessel diameter. These stents were redilated successfully, although the definition of “successful” is not given. The authors conclude that this “may be a promising new device for the permanent treatment of stenotic vessels in infancy and childhood.”

The primary advantage of this technique seems to be that the stents can be implanted through small (5 Fr) sheaths. However, one must interpret this report with caution. As the authors themselves point out, these stents were implanted in native nonstenotic vessels. Whether similar success is achievable in diseased stenotic vessels is not clear. Additionally, the fact that the radial strength of this split stent will be disturbed could be of major concern. Redilating, especially using high-pressure balloons, is likely to deliver outward forces to the stenotic vessel in a nonuniform manner. This nonhomogeneity of force coupled with the increased elastic filaments, which were stretched and widely separated as demonstrated in the present report, raises serious questions about the use of this technique in small infants with diseased vessels. This concern would also be true for a stent with a single longitudinal split, as described by Ing et al. [2]. Finally,

the fact that the two halves of the stents described in the present report had separated with growth of the vessel raises the question as to how much they are responsible for the lack of stenosis in the older animals.

Another stent with a novel design described by Forbes et al. [3] has many of the characteristics desirable in a stent that can be redilated to a larger size in growing children. This stent, which is not split, requires a 6 Fr sheath for implantation, but it is flexible enough to be implanted in the pulmonary arteries and can be dilated up to 20 mm. Because of the design of the stent, interposing omega hinges between cells, it maintains uniform radial strength with little shortening on subsequent dilation, unlike a similar stent without the newer design [4].

The issue of implanting stents in infants and small children has been problematic because of the inability to dilate the stents to an adequate size as the child grows. Innovations, such as the one described in this report, have begun to address this issue. As with many other developments in the catheterization laboratory, it is only a matter of time before this issue is resolved. Whether the right technique will include use of a split stent or some other design remains to be seen.

REFERENCES

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