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Cracking of coronary stents

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Because of their low-profile design, premounted stents can be delivered via smaller sheaths than manually crimped stents, allowing stent treatment in smaller patients. Off-label use of premounted coronary stents offers just a temporary benefit because they are only dilatable to small diameters, leading to a mismatch between maximal stent diameter and natural vessel growth. Therefore they are generally avoided in pediatric patients with only anecdotal reports in life-threatening situations when surgery is not available. However, even if the total patient number is low, there are some children with implanted coronary stents needing further treatment options.

Methods and results

In a bench test a Coroflex Blue 4x13mm - and a Medtronic Integrity 4 x 9mm stent were inflated with ultra-high pressure balloons. Consecutive inflation of both stents with a Conquest 6mm and 8mm balloon with 40 atmospheres (rated burst pressure 40 atm), cracked the stents.

The same inflation protocols were applied in a patient with early chylous effusions after total cavopulmonary anastomosis (TCPC). The patient's left pulmonary artery (LPA) had formerly been stented with a Medtronic Integrity Stent 4x9mm, which could not be removed surgically during the TCPC operation. By cracking the coronary stent, the LPA stenosis was treated successfully.

Conclusion

Coronary stents are no longer a one-way treating option in children with congenital heart disease. They may be cracked with recently available ultra-high pressure balloons opening new possibilities to treat stenosis even in the newborn period. Care needs to be taken to increase the balloon size diameters by small increments (2 mm) to avoid severe stent length shortening.