MedCrave
Step into the World of Research

Journal of Cardiology & Current Research

Case Report

Open Access

CrossMark

Double coronary balloon angioplasty in an infant with re-coarctation of the aorta

Abstract

We report a unique case of double coronary balloon usage in a 10-week-old male infant who developed significant symptomatic re-coarctation following a prior successful surgical repair for severe coarctation of the aorta. The re-coarctation was long and resistant to pliable low-pressure balloon dilation. To avoid vascular injury and because of the infant's small size (4.3 kg), two high- pressure coronary balloons were used through a single 4F sheath. This approach successfully reduced the pressure gradient from 28 mmHg to 3 mmHg, with marked angiographic improvement. Nine months post-procedure, the infant is stable, asymptomatic, and thriving. This case highlights the safety and efficacy of using high-pressure coronary balloons in small infants to minimize vascular trauma.

Volume 17 Issue 4 - 2024

Khalid Al-Dhahri
Ministry of Health Saudi Arabia, Saudi Arabia

Correspondence: Khalid Al-Dhahri, MBBS, Ministry of Health Saudi Arabia, Saudi Arabia, Email: kdhahri@yahoo.com

Received: October 26, 2024 | **Published:** December 02, 2024

Introduction

Coarctation of the aorta (CoA) is a congenital cardiac anomaly that accounts for 5-8% of congenital heart defects. Surgical repair has traditionally been the treatment of choice, though balloon angioplasty has gained popularity, particularly in recurrent or residual coarctation. Stent implantation is often reserved for older children and adults, but in infants, avoiding large introducers is crucial to minimize vascular injury. We present the first case of successful double coronary balloon usage in an infant with re-coarctation of the aorta, which provided a unique solution to address a challenging vascular anatomy and avoid complications associated with larger instruments.

Case Presentation

A 14-day-old neonate was transferred to our institution with a diagnosis of severe coarctation of the aorta. The infant presented in cardiogenic shock and was managed with mechanical ventilation and inotropic support (prostaglandins, dopamine, and dobutamine). On admission, his blood pressure in the right arm was 120/75 mmHg, and 50/30 mmHg in the lower extremities with absent femoral pulses. Echocardiography revealed a severe coarctation with a peak gradient of 80 mmHg, and a narrowed segment measuring 2 mm in diameter, alongside a bicuspid aortic valve, normal left ventricular function, and a moderate-sized patent ductus arteriosus (PDA).

The infant underwent a successful surgical repair of the coarctation via end-to-end anastomosis. Postoperative echocardiography showed a mild residual coarctation with a gradient of 20 mmHg, and the patient's postoperative course was uneventful.

However, during follow-up, the infant began to show signs of congestive heart failure, with poor weight gain despite anti-failure therapy. At 10 weeks of age, he was found to have a significant re-coarctation with a pressure gradient of 70 mmHg across the coarcted segment. His right arm blood pressure was 115/48 mmHg, while his leg blood pressure was 70/50 mmHg. The decision was made to proceed with balloon angioplasty after obtaining parental consent.

Procedure

Cardiac catheterization confirmed the re-coarctation, with a pressure gradient of 30 mmHg across the narrowed segment. Given the infant's small size (4.3 kg) and the length of the re-coarctation, the decision was made to use two high-pressure coronary balloons. The aim was to avoid the need for a larger sheath, which could increase the risk of vascular complications. Two coronary balloons were advanced through a 4F sheath, and the procedure was successful in reducing the pressure gradient from 28 mmHg to 3 mmHg, with significant angiographic improvement.

Outcome and follow-up

The infant tolerated the procedure well, with no immediate complications. A follow-up examination nine months later showed no signs of re-coarctation, and the infant was asymptomatic and thriving with normal blood pressure measurements.

Discussion and conclusion

Balloon angioplasty has become a common intervention for re-coarctation of the aorta, with good immediate and long-term results. However, in small infants, using larger introducers can result in arterial injury and long-term vascular complications. The use of high-pressure coronary balloons offers a viable alternative to avoid the need for larger instruments, especially in infants with long-segment re-coarctation, as seen in this case.

The literature supports both surgical and catheter-based interventions for managing CoA, with balloon angioplasty being particularly useful in recurrent cases. However, the risks of restenosis and vascular injury remain challenges.[1] This case demonstrates that coronary balloons can be used effectively in infants to minimize the need for large sheaths, with excellent clinical outcomes and no evidence of re-coarctation at follow-up. This case illustrates the feasibility and safety of using high-pressure coronary balloons in small infants with re-coarctation of the aorta. By using two coronary balloons through a single 4F sheath, we were able to achieve a significant reduction in pressure gradient while avoiding vascular injury. This approach may be particularly useful in infants where avoiding larger introducers is critical.

Acknowledgments

None

Conflicts of interest

The author don't have any conflicts of interest.

References

1. Doshi AR, Rao PS. Coarctation of aorta: management options and decision making. *Pediat Therapeut.* 2012.