

How Transfemoral Venous Cannulation Facilitates Transaxillary Pediatric Cardiac Surgery



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Background

Minimally invasive pediatric cardiac surgery via right axillary minithoracotomy offers excellent cosmetic and clinical outcomes but is technically limited by the restricted surgical field and the need for central cannulation in small children. This case highlights the use of a transfemoral venous SmartCanula to overcome these limitations during VSD and RVOT repair in a young child.

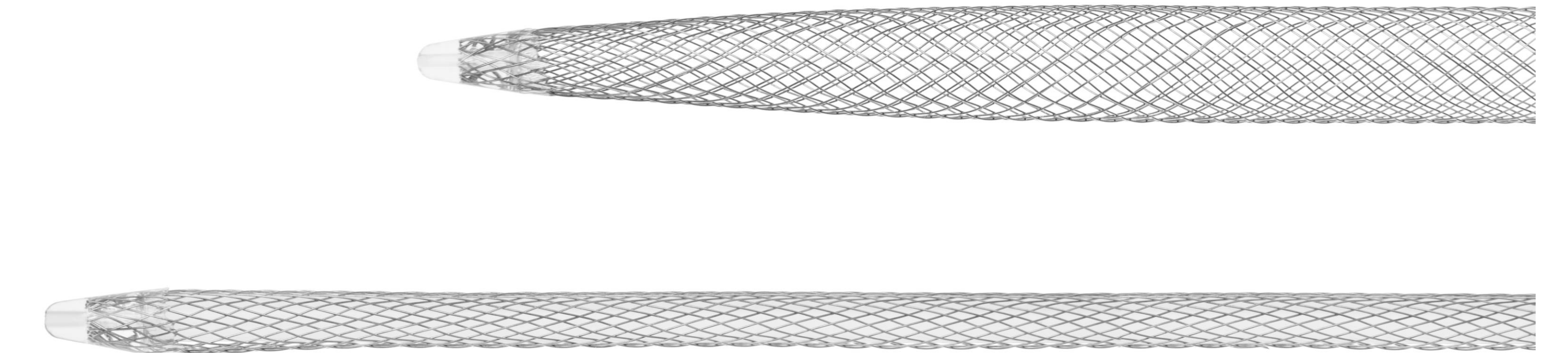
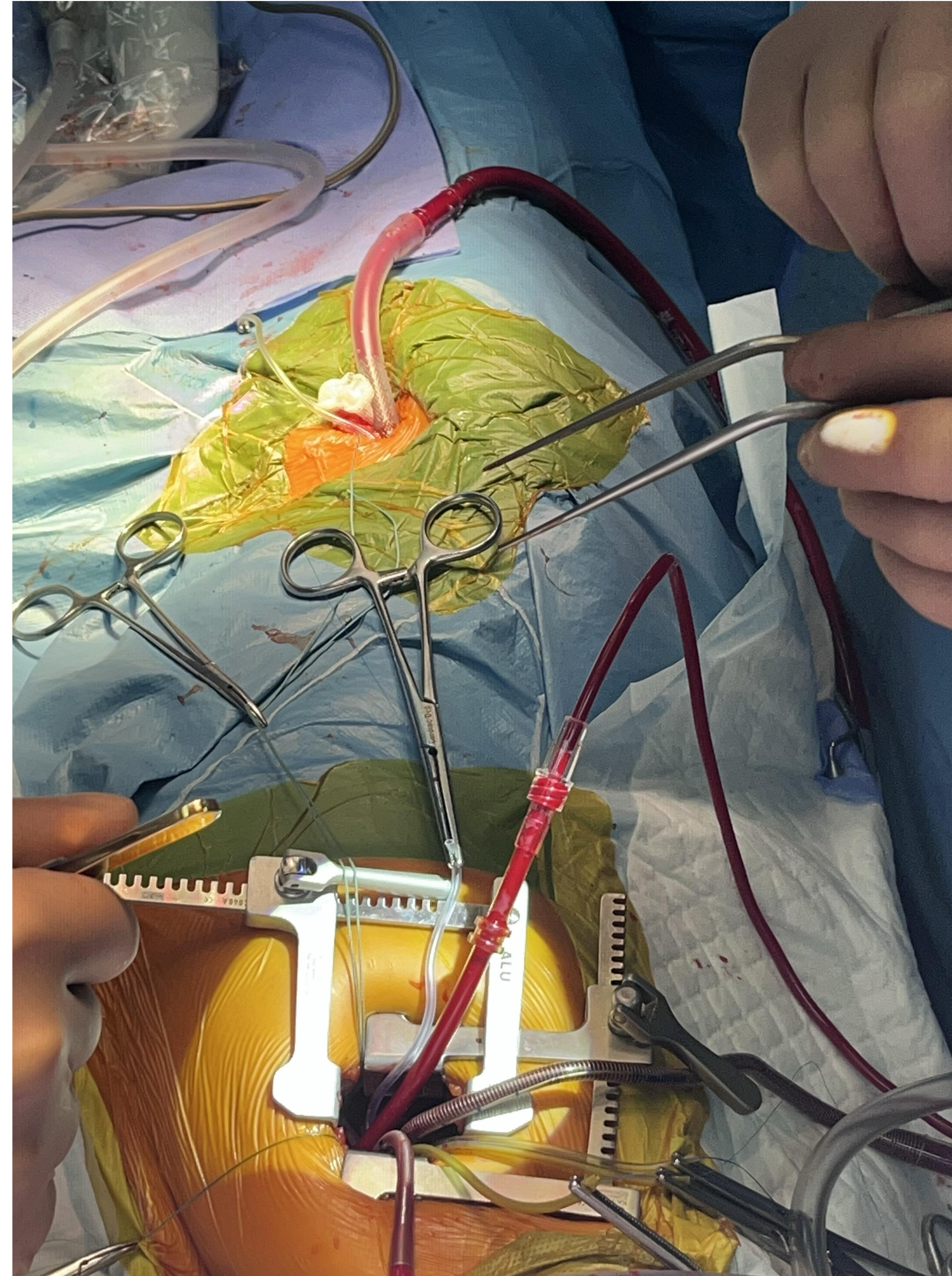
Case presentation

A 3-year-old girl (13.2 kg, BSA 0.56 m²) with a restrictive perimembranous VSD and muscular RVOT obstruction (pulmonary annulus z-score -0.5) underwent surgery via a right axillary thoracotomy (4th intercostal space, 3.5 cm incision).

Cardiopulmonary bypass was established using:

- **Aortic and SVC cannulation:** Central (12Fr arterial DLP, 14Fr venous Medtronic)
- **IVC cannulation:** Transfemoral SmartCanula (20Fr, 340 mm)

The right atrium was opened. The VSD was closed via the tricuspid valve. RVOT resection was performed partly through the tricuspid valve and partly via a longitudinal RVOT incision. The pulmonary valve was assessed using a 12Fr Hegar dilator.



SmartCanula after and during insertion

Results

The transfemoral SmartCanula enabled unobstructed access to the heart and improved mobility within the small thoracic cavity, facilitating effective VSD and RVOT exposure.

- No interference with the surgical field
- ICU stay: 1 night
- Discharged on postoperative day 5
- Discharge echo: no residual VSD or RVOT gradient

Conclusions

Transfemoral IVC cannulation using the SmartCanula significantly enhances the working space in transaxillary pediatric cardiac surgery. This approach supports safe, efficient repair of congenital heart defects in infants and toddlers without the need for full sternotomy.