

Comment on: Transcatheter atrial septal defect closure in children weighing ≤ 15 kg: Is body weight still the appropriate threshold?

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Introduction

We read with great interest the article by Pamuk et al. (1) entitled “Transcatheter atrial septal defect closure in children weighing ≤ 15 kg: A single-center experience”. The authors should be congratulated for addressing an important and still controversial issue in pediatric interventional cardiology. Transcatheter closure of secundum atrial septal defects (ASDs) in small children has traditionally been approached with caution because of concerns regarding vascular access, device-to-body size relationships, cardiac chamber dimensions, and the potential for procedural complications.

The most important finding of this study is the 100% procedural success rate and the very low incidence of complications. Among 34 children weighing ≤ 15 kg, only one patient experienced a brief, self-limited episode of supraventricular tachycardia, while no device embolization or other major complications were observed (1). These findings are encouraging and support the concept that body weight alone should not necessarily constitute an absolute contraindication to transcatheter ASD closure in appropriately selected patients.

The findings are consistent with previous studies. Bartakian et al. reported that device closure of secundum ASD in children weighing < 15 kg can be performed successfully, although complication rates and the indications for referral require careful consideration (2). Similarly, Joseph et al. demonstrated the feasibility of transcatheter device closure in symptomatic children weighing < 15 kg, providing further evidence that selected patients below the conventional weight threshold may undergo successful transcatheter treatment (3).

However, an important point should be emphasized when interpreting the current study. Although the authors studied children weighing ≤ 15 kg, the median body weight was 14.25 kg and the lowest weight was 12 kg. Therefore, the findings predominantly represent children close to the conventional 15-kg threshold rather than very small infants. This distinction is clinically important because children weighing 12–15 kg may differ substantially from those weighing < 10 kg in terms of vascular access, cardiac dimensions, device-to-body size relationships, and procedural complexity.

Indeed, previous studies have demonstrated that transcatheter ASD closure can also be performed in children weighing < 10 kg. Puthiyedath et al. (4) recently reported successful device closure in 95 of 96 symptomatic children weighing < 10 kg, while Knop et al. (5) demonstrated successful Amplatzer device implantation in 26 of 28 children weighing ≤ 10 kg. These studies suggest that the lower limit for transcatheter intervention may be substantially below 15 kg in selected patients. Nevertheless, the favorable outcomes observed in a cohort with a minimum body weight of 12 kg cannot necessarily be extrapolated to children weighing < 10 kg, who may have substantially different anatomical and procedural characteristics.

Another strength of the study is its emphasis on careful patient selection and device sizing. The mean device-to-weight ratio was 1.05 ± 0.27 , and the authors reported no excessive defect-to-weight ratio in their cohort. The high procedural success may therefore partly reflect appropriate anatomical selection, meticulous echocardiographic assessment, balloon sizing, and operator experience. Notably, this ratio was considerably lower than the median device-to-body-weight ratio of 1.93 reported by Puthiyedath et al. (4) in children weighing < 10 kg. In our opinion, these factors may be more clinically relevant than body weight alone when determining the feasibility of transcatheter ASD closure.

The rapid right ventricular remodeling observed in the study is also noteworthy. Right ventricular dimensions normalized in most patients within the first few days, with a median normalization time of one day. This finding supports the physiological benefit of eliminating significant left-to-right shunting in appropriately selected symptomatic children. Nevertheless, because the study was retrospective, single-center, and lacked a control group, it remains difficult to determine whether early remodeling translates into superior long-term clinical outcomes compared with surgical closure or delayed intervention.

The clinical indications reported by the authors also deserve attention. Failure to thrive and recurrent respiratory infections were important reasons for early intervention, while right ventricular enlargement was used as an indication primarily in children older than four years and close to 15 kg. These findings further emphasize that the decision for early closure

should integrate clinical symptoms, shunt magnitude, right ventricular volume overload, ASD morphology, rim adequacy, and patient size rather than relying on body weight alone.

Taken together, the available evidence suggests that the conventional 15-kg threshold may increasingly be regarded as a pragmatic reference point rather than a strict biological or anatomical boundary. Nevertheless, moving below this threshold should not imply that weight is irrelevant. Instead, transcatheter closure should probably be considered within a multidimensional assessment incorporating patient weight, age, ASD size, defect-to-body-weight relationship, device-to-body-weight relationship, rim anatomy, cardiac chamber dimensions, pulmonary hemodynamics, and operator experience. In this context, body weight may be more appropriately viewed as a continuous risk modifier rather than a binary eligibility criterion.

We therefore believe that the study by Pamuk et al. (1) makes an important contribution to the growing literature on transcatheter ASD closure in small children. Future multicenter studies including substantially smaller children—particularly those weighing <10 kg—with longer follow-up and standardized anatomical and procedural criteria would be valuable in defining the true lower limits of safe transcatheter ASD closure.

In conclusion, the present study provides reassuring evidence that transcatheter ASD closure can be performed safely and effectively in carefully selected children weighing ≤ 15 kg. However, because the study population ranged from 12 to 15 kg, its findings should not be directly extrapolated to substantially smaller children, particularly those weighing <10 kg. Rather than using body weight as an isolated exclusion criterion, an individualized approach based on anatomy, hemodynamics, device-to-body size relationship, clinical status, and operator experience may provide a more appropriate framework for decision-making.

References

1. Pamuk U, Gürsu HA, Azak E, Özdemir Şahan Y, Çetin İİ. Transcatheter atrial septal defect closure in children weighing ≤ 15 kg: A single-center experience. *Turk J Pediatr Dis*. 2026;20(4):226-30. <https://doi.org/10.12956/TJPD.2026.1273>
 2. Bartakian S, Fagan TE, Schaffer MS, Darst JR. Device closure of secundum atrial septal defects in children <15 kg: complication rates and indications for referral. *JACC Cardiovasc Interv*. 2012;5:1178-84. <https://doi.org/10.1016/j.jcin.2012.07.009>
 3. Joseph SP, Mirza SU, Krupa J, Varghese SI, Kartha GB, George OK, et al. Clinical and procedural characteristics of successful transcatheter device closure of ostium secundum atrial septal defect in symptomatic children weighing <15 kg: a retrospective study spanning one decade from South India. *J Saudi Heart Assoc*. 2024;36:14. <https://doi.org/10.37616/2212-5043.1365>
 4. Puthiyedath T, Sagar P, Sivakumar K. Safety and feasibility of transcatheter closure of atrial septal defects in small children weighing less than 10 kg. *Cardiol Young*. 2024;34:2449-56. <https://doi.org/10.1017/S1047951124025897>
 5. Knop M, Szkutnik M, Fiszer R, Białkowska B, Glowacki J, Białkowski J. Transcatheter closure of atrial septal defect in children up to 10 kg of body weight with Amplatzer device. *Cardiol J*. 2014;21:279-83. <https://doi.org/10.5603/CJ.a2013.0120>
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