

Long-term follow-up of patients with left lung perfusion abnormalities following transcatheter closure of patent ductus arteriosus

*Demir F, Celebi A, Saritas T, Erdem A, Demir H, Yücel I K, Dedeoğlu R
Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of
Pediatric Cardiology, Istanbul, Turkey*

Background: This study presents the long-term follow-up of patients who developed left lung perfusion (LLP) abnormalities following patent ductus arteriosus (PDA) closure with various device types.

Methods: The study includes 23 adult and pediatric patients who had undergone transcatheter PDA closure and were shown to have decreased LLP (<40%) by the first scintigraphy performed within the average follow-up period of 14,0±8,12 (2,0-30) months. For PDA closure, the Amplatzer duct occluder was used in 12 patients and coils were used in 11. Within the average period of 58,91±12,93 (37-85) months after transcatheter PDA closure a second lung perfusion scintigraphy was performed.

Results: In 13 of 23 patients (56.5%) having impaired LLP improved by the time of the second scintigraphy. Improved and unimproved patients didn't differ with regard to age, weight, body surface area, PDA diameter, ampulla diameter and PDA length at the time of PDA closure and the second scintigraphy. There was no significant difference with regard to the percent of improved patients between the different device types ($p=0.88$). Also the left pulmonary artery indexes was insignificantly different ($P=0.446$). Patients with persistent LLP abnormality have significantly higher mean DVI [(LPA blood flow velocity - RPA blood flow velocity) / MPA blood flow velocity] x 100 values ($p=0.007$) and PDA diameter / length. If the DVI $\geq 50\%$ is taken as the cut-off value it is possible to predict patients with persisting LLP abnormality with 80% sensitivity and 76% specificity. The abnormality could persist in patients having PDA diameter / length ≥ 0.5 with 80% sensitivity and 92.3% specificity.

Conclusions: The LLP abnormalities seen after PDA closure with various devices eventually improve to normal in the majority of patients during long-term follow-up. Patients whose PDA length is shorter than its diameter are at risk of developing LLP abnormalities that persist long-term.