

REDUCTION OF RADIATION EXPOSURE IN TRANS CATHETER ATRIAL SEPTAL DEFECT CLOSURE: HOW LOW SHOULD WE GO?

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BACKGROUND

Cardiac catheterization relies on X-ray imaging. Most of the procedures are now standardized. Interventionists must now work hardy to minimize radiation exposure in order to reduce risk of induced cancers.

OBJECTIVE

The aim of the study was to describe radiation level in our institution and evaluate the components contributing to radiation exposure during transcatheter atrial septal defect (ASD) closure.

METHODS

Radiation doses for ASD closure performed between January 2009 and November 2015 were retrospectively reviewed. Fluoroscopic time, dose area product (DAP $\mu\text{Gy}\cdot\text{m}^2$), DAP/kg of body weight ($\mu\text{Gy}\cdot\text{m}^2/\text{kg}$), and total air kerma (mGy) were collected.

RESULTS

One hundred seventy-four consecutive patients were included. Procedural success was 98.3%. Median procedural and fluoroscopic times were respectively 15-min and 1.2-min. Median total air kerma, DAP and DAP/kg were respectively 9.2-mGy, 88.3- $\mu\text{Gy}\cdot\text{m}^2$ and 3.2- $\mu\text{Gy}\cdot\text{m}^2/\text{kg}$. Risks factors associated with higher DAP were older age, larger ASD and device, need of balloon calibration, occurrence of complications and use of higher frame rate. Reduction of frame rate to 7.5 f/s alone reduced by 2 the median DAP, DAP/kg and air kerma (99 vs 43- $\mu\text{Gy}\cdot\text{m}^2$; 3.5 vs 1.7- $\mu\text{Gy}\cdot\text{m}^2/\text{kg}$; 11 vs 4.8-mGy, $p<0.001$).

CONCLUSION

Low dose of radiation can be achieved for transcatheter ASD closure even in complex ASDs with subsequent recommendations: reduction of frame rate, avoidance of lateral view and cine acquisition, limitation of fluoroscopic time by avoiding unnecessary manoeuvres and by using echocardiographic guidance as much as possible.