Percutaneous Closure of ASDs with Relatively Deficient Rims – Tips and Tricks

Krishna Kumar
AIMS
Cochin
Key Questions?

• Is percutaneous closure possible?
• Device size?
• Closure technique?
Definition and Terminology

Superior

Posterior

Anterior

Inferior

IVC

SVC

Asc Aorta

cs

TV

Inferior
ASDs with adequate and minimal margins
Atrial Septal Evaluation: TTE

Deficient inferior rim

Inferior rim: absent

Adequate superior and inferior rims
The Apical Views

Inferior sweeps reveal posterior structures
Imaging the IVC Margin

- Sub-xiphoid views are also very useful provided there are good acoustic windows.
- Imaging through TEE requires special maneuvers.

LA
RA
EV
Imaging the IVC Margin through conventional TEE: Why is it difficult?
Imaging the IVC Margin through conventional TEE: Why is it difficult?

Imaging the IVC Margin through TEE: The modified retroflexed view

A

TEE probe

Device

B

TEE probe

Device
Conventional

Retroflexed
Choosing size of the device

- Balloon stretched diameter
  - Unrealistic for large ASDs with minimal rims?
- Largest dimension on TEE
  - + 2mm to be safe
  - ± 1mm in small children
  - + 4 mm
    - Deficient margins
    - Floppy
    - Adjacent defects
Acceptable limits of device sizing

**Children:**
- 8-10 Kg: < 15 mm
- 10-15 Kg: < 20 mm
- 15-25 Kg: < 28-30 mm

**Adults:**
- 40-46 mm

(Kannan BRJ, Anil SR, Sivakumar K, Kumar RK, Transcatheter closure of the very large atrial septal defects using the Amplatzer septal occluder, Catheterization and Cardiovascular Interventions 2003;59:522-527)
Device Deployment: Usual Sequence
ASD with deficient rims: deployment not likely to be straightforward?

- Poor alignment of assembly vs. plane of the defect
Device Deployment Techniques to Ensure Rim Capture

Right atrial disc should form to the right of the septal plane before the left atrial disc can slip out

- Rapid release
- Hold on to the LA disc until RA disc is positioned
What to do when deployment is not straightforward?
ASDs with floppy or deficient posterior margins
Echo guided deployment
Echo guided deployment
Other “Tricks”

Making the sheath “coaxial to the defect
• Hausdorf
• Fu-star
• Cutting away a part of the sheath (Latson technique)
Assessment before release
Testing device stability
What Determines Results of Catheter Closure of ASD?

- **Anatomy of defect**
  - Size
  - Location
  - Margins
  - Neighboring structures
  - Associated lesions

- **Patient characteristics**
  - Weight
  - Age
  - Co-morbidity

- **Equipment**
  - Echocardiography
  - Devices
  - Delivery systems

- **Operator(s)**
  - Imaging guidance
  - Experience
  - Hand-eye coordination