3DTEE and Transcatheter Closure of ASD

Clinical advantage of 3DTEE in patients with complex shaped ASD

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Disclosure

none
Morphologic variations of ASD is common!

The role of transesophageal echocardiography in transcatheter closure of secundum atrial septal defects by the Amplatzer septal occluder

Uros Mazic, MD, MSc,a Pavol Gavora, MD,b and Jozef Masura, MD, PhDb Ljubljana, Slovenia, and Bratislava, Slovak Republic

- Multiple defects: 5%
- ASD with ASA: 6%
- Sufficient rim: 27%
- SA rim deficiency: 46%
- IP rim deficiency: 16%

SA, Superoanterior; IP, Inferoposterior; ASA, Atrial septal aneurysm
Real-time 3D TEE
Case 1, 38 y.o female (multiple defects)

0 degree

Color Doppler

Maximal ASD diameter = 15mm & 5mm
Distance between defects = 10mm
Aortic rim deficiency
3D TEE

LA enface view

RA enface view
Catheter passing through ASDs

Larger defect

Both defects

(LA enface view)
Balloon sizing

Larger ASD

Balloon sizing diameter=17mm

Smaller ASD

Balloon sizing diameter=6mm
Deployment (X-plane view)

Smaller ASD

ASO 6mm

Larger ASD

ASO 18mm
Release devices

Smaller ASD

Larger ASD
After releasing devices

LA enface view  
RA enface view
Case 2, 39 y.o female (Intra-right atrial structure)

Maximal ASD diameter (2D) = 28mm
RT3D TEE

LA enface view

RA enface view
Catheter crossing through the ASD
32-mm ASO
After deployment

Wiggle (X-plane mode)  RT 3DTEE (side view)
After the procedure

LA enface view

RA enface view
RT 3D TEE image

3D zoom

- assessing the shape and the location of defects

3D full-volume

- measuring maximal ASD diameters
- assessing surrounding rims
Application of Real-Time Three-Dimensional Transesophageal Echocardiography Using a Matrix Array Probe for Transcatheter Closure of Atrial Septal Defect

Maruçu Taniguchi, MD, Teiji Akagi, MD, Nobusuke Watanabe, RDQS, Yoshihito Okamoro, MD, Koji Nakagawa, MD, Yasufumi Kijima, MD, Norihisa Tobih, MD, Shinichi Ohnuki, MD, Kenzo Kusano, MD, and Shinji Sano, MD, Okayama, Japan

Feasibility of real-time three-dimensional transoesophageal echocardiography for guidance of percutaneous atrial septal defect closure

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Image quality

% of patients with or without optimal 3D image

<table>
<thead>
<tr>
<th>3D zoom</th>
<th>91.3%</th>
<th>8.7%</th>
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</thead>
<tbody>
<tr>
<td>3D full-volume</td>
<td>82.0%</td>
<td>18.0%</td>
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Logistic regression analysis of less likely to be obtained good-quality full-volume data for the measurements

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95%CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>1.06</td>
<td>1.03-1.09</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Deficient IP rim</td>
<td>0.22</td>
<td>0.07-0.64</td>
<td>0.005</td>
</tr>
</tbody>
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Other variables: multiple defects, maximal ASD size, body weight, BSA, Qp/Qs
Feasibility of 3DTEE in patients with multiple ASDs

- 3D zoom image:
  - Multiple ASDs: 85.2%
  - Single ASD: 94.1%
  - p = 0.11

- 3D full-volume image:
  - Multiple ASDs: 83.3%
  - Single ASD: 91.5%
  - p = 0.19
Multiple defects
Torn Atrial Septum during Transcatheter Closure of ASD

Intra-RA structure

SVC

Tricuspid valve

IVC
Conclusion

• In patients with optimal 3D zoom images, compared to 2D TEE images, 3D enface images contributed greatly to understanding ASD.

• RT3D TEE is feasible and effective imaging modality during transcatheter closure of difficult ASD, especially in patients with complex shaped ASD.