**Anatomic Interaction Between the Aortic Root and the Atrial Septum: An Echocardiographic Prospective Study**

Géraldine Bertaux, Jean-Christophe Eicher, Annie Petit, Petr Dobšák, Pierre Louis, Jean-Eric Wolf, St Ann University Hospital, Dijon, France, St Ann University Hospital, Brno, Czech Republic

**Background:** Patent pneumothorax syndrome is a rare pattern of dyspnea that may be observed with atrial right-to-left shunting (RLS). A few cases have been reported in association with an atrial aneurysm, but no documented pathophysiological explanation has been proposed.

**Methods:** We studied 72 consecutive patients (mean age 66.2 ± 10.68 years) referred for pre-operative evaluation of any anatomic or functional abnormalities. All patients underwent a complete cardiac echocardiographic examination. A PFO was sought by contrast injection into the brachial vein and the femoral vein, and the RLS was categorized as grade 1, 2 or 3. The relationships between AoD, ASo, and ASd were studied.

**Results:**

Mean AoD was 43.4 ± 9 mm (range 30-64). A PFO was found in 26% of the patients. Correlation study:

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<tr>
<td>AoD / ASo</td>
<td>-0.49</td>
<td>&lt;0.002</td>
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<tr>
<td>AoD / ASd</td>
<td>0.24</td>
<td>0.041</td>
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<tr>
<td>ASo / ASd</td>
<td>-0.37</td>
<td>&lt;0.002</td>
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In 19 patients with a PFO, we looked at the relationship between RLS grade and ASo. Mean AoD was 43.4 ± 9 mm (range 30-64). A PFO was found in 26% of the patients. Atrial Septum: An Echocardiographic Prospective Study

**Interpretation:** These results demonstrate that a dilatation of the aortic root significantly affects the aortic septal morphology by reducing its apparent size, decreasing its tautness, and increasing its mobility. The increased septal mobility appears to be an important risk factor for RLS in the presence of a PFO.

**T019-201**

**Migraine Relief Following Transcatheter Closure of Patent Foramen Ovale**

Mark Reisman, Jill T. Jesurum, Merrill P. Spencer, Kimberly A. Krabill, Lance Diehl, John V. Olsen, Christine Smith, William A. Gray, Swedish Medical Center, Seattle, WA

**Background:** Current theory suggests that right-to-left shunt (RLS) through a patent foramen ovale (PFO) permits paradoxical microemboli and neuremediators to bypass lung filtration thereby potentially triggering migraine aura. The purpose of this study was to determine if transcatheter PFO closure in migraineurs is associated with a reduction in migraine frequency.

**Methods:** Between July 2001 and 2003, 105 patients underwent transcatheter PFO closure to prevent recurrent cryptogenic stroke or transient ischemic attack. According to criteria defined by the International Headache Society, 42% (50/120) of patients experienced active migraine symptoms and 28% (34/120) of those reported migraine aura. Follow-up PFO closure, patients were serially evaluated to assess residual RLS and migraine frequency. Contrast transcranial Doppler was used to measure microembolic signals of raised left atrial pressure before procedure and 6 months post closure.

**Results:** In 19 patients with a PFO, we looked at the relationship between RLS grade and ASo. Mean AoD was 43.4 ± 9 mm (range 30-64). A PFO was found in 26% of the patients. Atrial Septum: An Echocardiographic Prospective Study

**Interpretation:** These results demonstrate that a dilatation of the aortic root significantly affects the aortic septal morphology by reducing its apparent size, decreasing its tautness, and increasing its mobility. The increased septal mobility appears to be an important risk factor for RLS in the presence of a PFO.

**T019-202**

**Effect of Rim Deficiency and Occluder Size on Acute and Mid-Term Results of Transcatheter Atrial Septal Defect Closure in Adults**

Maria Heger, Raphael Rosenheik, Harald Gabriel, Thomas Binder, Gerald Maurer, Peter Probst, Helmut Baumgartner, University of Vienna, Vienna, Austria

**Background:** Although a rim of >5mm around the defect was originally considered mandatory for transcatheter atrial septal defect (ASD) closure, defects with < 5mm rim to the aorta are now accepted. Whether this may be associated with damage of the aortic wall, a higher likelihood of residual shunt, aortic regurgitation (AR) or other unfavorable effects especially when using larger sized occluders has not been studied.

**Methods:** All pts in whom ASD closure was attempted between 1998 and 2002 were included (n=111, 80 female, 52±17yrs, Amplatzer occluder, mean follow-up [FU] 2.2±1.2 yrs). Sufficient rim was present in 36 pts. (group A), 48 pts. (group B) had only a small rim (1-4mm), 27 pts. had no rim to the aorta (group C). FU studies were performed at 3, 6 and 12 months and every year thereafter.

**Results:** The procedure was successful in all pts. (occluder size 25±5mm, range 9 to 40mm). No major complications occurred. Minor complications were: transient ST elevation (2), transient AV block (1) and transient SVT (4). At last FU, no relevant residual shunt was present in any pt., while 5 pts. (group A: 3; group B: 2) had mild shunts (Qp:Qs ≤ 1.3). Mild AR was present in 20 pts. prior to intervention. In only 1 pt. an increase to mild mitral regurgitation was found (group C). Six pts. (group A: 3; group B: 2; group C: 1) presented with a new finding of trace or mild AR at FU. Mild mitral-regurgitation (MR) was common prior to intervention (71 pts.). In 4 pts. an increase to mild-to-moderate MR was observed (group A: 1; group B: 3). Trace MR was an inconsistent finding disappearing in 6 pts. and remaining in 17 pts. (group A: 6; group B: 7; group C: 4). No aortic complications were observed. The only adverse events observed during FU were transient palpitations and the occurrence of atrial fibrillation (group A: 2; group B: 4; group C: 3). The occluder size was not related to any of these observations. The 2 patients who reported no change in symptoms following the procedure had evidence of coronary artery disease. A significant reduction in RLS was observed following PFO closure in migraines with and without aura (N = 44), during normal respiration (146 ± 128 vs. 22 ± 63, p < 0.01) with calibrated strain (270 ± 65 vs. 92 ± 125, p < 0.01). Complete closure without residual RLS was achieved in 61% (27/44) of patients. Atrial Septum: An Echocardiographic Prospective Study

**Conclusion:** Transcatheter PFO closure results in significant reduction in migraine frequency. The mechanism of this causal effect warrants further investigation.

**T019-203**

**Stability of the Amplatzer Septal Occluder Device: Impotence of the Atrial Tissue Rim**

Arkush K. Chhabra, Babak Azarbal, Hitoshi Anzai, Michael Fishbein, Catherine Diao, Vicki Chan, Richard Gaster, John Moore, Jonathan Tobis, University of California- Los Angeles, Los Angeles, CA

**Background:** Percutaneous closure of secundum atrial septal defects (ASD) with the Amplatzer Septal Occluder device requires an adequate rim of septal tissue to stabilize the device through the atrial septum. The amount of septal tissue and atrial rim necessary for stabilization has not been quantified. Methods: An artificial ASD was created in fresh autopsy hearts through a right atrial incision. ASDs (12 to 40 mm in diameter) were created and 9 sizes of Amplatzer (12 through 40mm) were inserted. The force required to pull these devices through the ASD was measured in 260 attempts with a handheld ergometer. In 9 hearts, sequential 30-degree segments of atrial rim 7 mm wide were removed, and the force required to pull the device through the atrial septum was re-measured.

**Results:** The force required to pull an Amplatzer device through a given ASD size with an