Transoesophageal Echocardiography

Date: 10/12/99, from 14:00 to 15:30

Location: Robert Stolz A

Chairpersons:

B. Cormier (Massy/FR)
R. Erbel (Essen/DE)

436 Mobile echoes detected by transoesophageal echocardiography early after implantation of prosthetic valves do not predict embolism: a study of the St Jude Standard and Silzone bileaflet valves
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Background. Mobile linear echoes ('strands' - S) are often seen on prosthetic valves by transoesophageal echocardiography (TEE) but their significance for embolic risk has not been assessed prospectively. Aim of the study. To assess whether S detected early after implantation of prosthetic valves predict embolism. Methods. We studied 190 patients (100 F; mean age 63.0 ± 10.2y) who had 116 aortic, 55 mitral, and 19 double valves implanted (117 St Jude Standard-SJS, and 73 St Jude silver-coated Silzone-SJSZ). Group 1 comprised 168 pts who were studied prospectively with TEE 2 hours postoperatively to document S, protruding aortic atheroma > 5 mm (AA), and spontaneous echo contrast (SEC). Group 2 comprised 22 pts studied retrospectively. All pts had clinical follow-up to document embolic events. Results. There were 46 pts with S, 21 pts with SEC, and 43 pts with AA. During a total follow-up of 321 patient-years, there were 9 major embolic events (7 in SJSZ pts) and 4 cases of valve thrombosis (3 in SJSZ pts, all asymptomatic). The proportion of time spent at adequate anticoagulation levels was not different in the groups with, as opposed to those without embolic events, or in SJSZ pts vs. SJM pts. The linearised rate of major embolism was 0.4/100pts/year for SJS, and 11.3/100pts/year for SJSZ (p<0.01), while for valve thrombosis it was 0.4 and 5.7 respectively (p<0.01). On logistic regression mitral prosthesis (R=0.27, p=0.01) and SJSZ valve type (R=0.21, p=0.02) were the only independent predictors of major embolic events. Conclusion. Mobile strands detected by transoesophageal echocardiography early after valve implantation do not predict subsequent embolic events in patients with St Jude bileaflet valves. Unexpectedly, the newly introduced Silzone valve appears to be associated with an increased embolic risk.

437 Multiplane transoesophageal contrast echocardiography in detecting intrapulmonary right to left shunts
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Background: Pulmonary arteriovenous malformations (PAVM) are rare and most common associated with hereditary hemorrhagic telangiectasia (HHT), but they can occur sporadically without genetic basis. Symptoms and complications (paradoxical embolism, brain abscess, hypoxemia, polycythemia and pulmonary bleeding) are frequent in this patients. Invasive pulmonary angiography (PA) and computed tomography (CT) are the standard imaging techniques. However, these methods are invasive (PA), expensive and not always available. This study tested the accuracy of multiplane transoesophageal contrast echocardiography(mTEE) for detection of pulmonary arteriovenous malformations. Methods: 10 Patients with suspected (PAVM) were evaluated by mTEE(5MHz probe, Hewlett Packard; Echovist®, Schering) arterial blood gas analysis (BGA), CT and PA. 20 Patients who underwent transcatheter closure of their atrial septal defect under TEE-guidance served as control subjects. If the appearance of contrast agent could be demonstrated entering the left atrium through a pulmonary vein, a right to left shunt was considered to be present. Results: 13 PAVM were diagnosed and localized by TEE. All 13 PAVM detected by TEE were confirmed by PA and CT. Furthermore mTEE diagnosed 2 right to left shunts which could be confirmed by BGA only, but not by PA or CT. There was a marked delay in the appearance of contrast agent in the left atrium after the right heart appearance only in very peripheral locations of the PAVM. The contrast agent appeared within 3 cardiac cycles in the case of a PAVM near the pulmonary hilum. There was no false positive result. Contrary to PA, CT and BGA only mTEE reached 100% sensitivity, specificity, positive and negative predictive value in this study. Conclusion: TEE is a feasible, reliable, economic and accurate method in diagnosing PAVM and may be used as a substitute for CT and PA.
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Relationship between coronary flow reserve, aortic distensibility and coronary angiography.

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Coronary flow reserve (CFR) measurements, known for about 40 years, are good markers of coronary distensibility. CFR was calculated from transoesophageal echocardiography (TEE) measurements combined with dipyridamole stress. During TEE, the grade 1-3 vessel was also examined, and following aortic distensibility indexes were calculated: Elastic modulus (Ep), Young modulus (Es). The values of 129 patients (n=79, 55%) and cardiomyopathy (n=5, 3%) underwent coronary angiography using a patent foramen ovale adjusted plane (beta-plane). The aortic valve does not always open during compression in these cases was on the level of aortic root or on the level of LVOT. Normally AoV was closed during release phase. However, three pts had a second opening of the AoV during release followed by closing (1 SOR, 2 no SOR). In one patient the AoV remained open through the whole release phase (no SOR). In 6 (13%) cases AoV was closed during compression and opened during release (3 SOR, 3 no SOR). The place of maximal tissue displacement from external chest compression was located above AoV level. In 5 (11%) cases the AoV did not open while compression was on the level of the aortic root or LVOT (all SOR). In 2 cases (4%) with SOR the AoV opened only during a part of all compressions.

Conclusions: The AoV opened during compression in the majority of cases. However, in a quarter of cases AoV was closed during compression. This can partly be explained by the resuscitation technique, and partly by the existence of spontaneous rhythm, even in the absence of a palpable pulse. Transoesophageal echocardiography could be helpful in optimizing cardiac massage during resuscitation.

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The aortic valve does not always open during compression in cardiopulmonary resuscitation.

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According to both the cardiac pump and the thoracic pump theory the aortic valve (AoV) should open during compression and close in the release phase during cardiopulmonary resuscitation (CPR). We assessed AoV movement on videorecordings from transoesophageal echocardiography during CPR. Included were cases with clear visualisation of the AoV position during at least one resuscitation cycle.

Results: A total of 47 episodes from 40 pts were analyzed: 20 episodes in 18 patients (pts) with spontaneous organized rhythm (SOR) without output, 17 episodes in 17 pts without SOR, and 10 episodes in 5 pts with and without SOR. In 34 (72%) cases (15 SOR, 19 no SOR) AoV opened during compression 5 to 17 mm. The place of maximal tissue displacement from external chest compression in these cases was on the level of aortic root or on the level of LVOT. Normally AoV was closed during release phase. However, three pts had a second opening of the AoV during release followed by closing (1 SOR, 2 no SOR). In one patient the AoV remained open through the whole release phase (no SOR). In 6 (13%) cases AoV was closed during compression and opened during release (3 SOR, 3 no SOR). The place of maximal tissue displacement from external chest compression was located above AoV level. In 5 (11%) cases the AoV did not open while compression was on the level of the aortic root or LVOT (all SOR). In 2 cases (4%) with SOR the AoV opened only during a part of all compressions.

Conclusion: The AoV opened during compression in the majority of cases. However, in a quarter of cases AoV was closed during compression. This can partly be explained by the resuscitation technique, and partly by the existence of spontaneous rhythm, even in the absence of a palpable pulse. Transoesophageal echocardiography could be helpful in optimizing cardiac massage during resuscitation.