

VALUE AND LIMITATIONS OF INTRAVASCULAR ULTRASOUND IN DISEASES OF THE AORTA: COMPARISON TO TRANSESOPHAGEAL ECHOCARDIOGRAPHY AND ANGIOGRAPHY.

Günter Görge, Raimund Erbel, Thomas Gerber, Junbo Ge, and Jürgen Meyer; II. Medical Clinic, University of Mainz, Germany.

The aim of our study was to evaluate the usefulness of intravascular ultrasound (IVUS) in comparison to transesophageal echocardiography (TEE) and angiography in patients with aortic diseases. Ten consecutive patients with suspected aortic disease underwent TEE, IVUS, and angiography. A 6F, 20 MHz rotational tip IVUS catheter was introduced over an 8F introduction sheath. In 7 patients with aortic dissection the diagnosis was correctly made by IVUS, TEE, and angiography. The dissection membrane was seen in full extent by IVUS in all patients. In 2 patients with coarctation of the aorta, minimal diameter of the stenosis could be measured exactly only by IVUS, while angiography failed because of over-projection. In one patient with aneurysm of the ascending aorta without dissection but with a small perforation, only TEE gave the exact diagnosis, while angiography and IVUS did not detect the lesion. No adverse effects were seen with the application of IVUS.

Conclusion: IVUS can accurately and safely identify the extent of aortic dissection. In comparison with TEE and angiography, IVUS provides unique informations, especially of the descending aorta, and is therefore of great value for diagnosis and decision making. Recent drawbacks of the 20 MHz IVUS catheter are the limited view in the far-field and the inability to position the catheter accurately within the ascending aorta.

THE ASSOCIATION BETWEEN PROTRUDING PLAQUES IN THE THORACIC AORTA AND SYSTEMIC EMBOLIZATION

Paul A. Tunick, Itzhak Kronzon, New York University Medical Center, New York, New York

We have recently reported that protruding atheromatous plaques (PAP) in the thoracic aorta were observed by transesophageal echocardiography (TEE) in pts with systemic embolization (SE). To better evaluate the association between thoracic aorta PAP and SE we reviewed the TEE's of 368 consecutive pts studied for various clinical indications. Ninety two (25%) of these pts had history consistent with SE, and were referred to evaluate possible cardiac source of embolization. PAP in the thoracic aorta were identified in 29/368 pts (8%). Sixteen of these 29 pts (55%) had history of SE. The incidence of thoracic aorta PAP was significantly higher in pts with history of SE, than in pts without SE [16/92 pts (18%) vs 13/276 pts (5%); $p < 0.001$]. Mobile component of the PAP was observed in 5/92 (6%) of pts with SE vs in only 2/276 (0.7%) of pts without SE ($p < 0.01$). Two pts with recurrent SE had extensive, mobile PAP in the aortic arch. Both underwent endarterectomy with removal of friable atheromatous material and clot, and became asymptomatic.

We conclude that in pts referred for TEE, PAP in the thoracic aorta is associated with higher incidence of SE. Mobile components of the PAP indicate a higher risk of embolization. The recognition of PAP may lead to better evaluation and treatment of the pt with SE.

DETECTION OF WALL MOTION CHANGES BY TRANSESOPHAGEAL 2D-ECHOCARDIOGRAPHY DURING TRANSESOPHAGEAL ATRIAL PACING.

Otto Kamp, Carel C. De Cock, Albert J Funke Kupper, Jan P. Roos. Free University Hospital Amsterdam, The Netherlands.

Transesophageal 2D-echo (TEE) in combination with transesophageal atrial pacing (TAP) is a new method of stress echocardiography. In 26 pts TEE with TAP was used for detection of LV wall motion changes. Short axis monitoring at the midpapillary level was obtained in all pts with good image quality at rest and during TAP. TAP was performed using a pacing wire, fixed anterior to the gastroscope, with the electrodes between 3 and 10 cm from the tip. TAP was stepwise increased from 80 to 140 beats/min. Stable capture was reached with 13 ± 3 ms pulses of 12 ± 4 mA intensity in 25 of 26 pts, except for 1 pt (4%) with failure of capture. In 1 pt TAP was stopped because of discomfort. Thus, in 24 pts TAP was feasible, 21 pts with and 3 pts without significant coronary artery disease (CAD). In 18 pts regional wall motion changes occurred (12 pts akinesia, 6 pts hypokinesia). The site of LV wall motion changes correlated well with the perfusion area of the diseased artery. X-ECG was performed in 26 pts, 12-lead ECG during TAP in 12 pts, and defined positive for CAD if ST $\downarrow \geq 1$ mm occurred.

Results N(%)	TEE (n=24)	X-ECG (n=26)	12-lead ECG (n=12)
sensitivity	18/21(86)	16/23(70)	6/9(67)
specificity	3/3(100)	1/3 (33)	3/3(100)
+ pred.value	18/18(100)	16/18(89)	6/6(100)

It is concluded that TEE with TAP is feasible and promising for assessment of wall motion changes, with higher sensitivity than X-ECG and 12-lead ECG during TAP, and is able to detect the site of significant CAD.

TRANSESOPHAGEAL ECHOCARDIOGRAPHIC DETECTION OF TRANSEPTAL CATHETER-RELATED THROMBI IN PATIENTS WITH MITRAL STENOSIS

Mark R Milner, Steve A Goldstein, Augusto D Pichard, Cathy Gross, Martin B Leon, Ken H Lee, Joseph Lindsay. Washington Hospital Center, Washington, D.C.

Transesophageal echocardiography (TEE) during transeptal catheterization for balloon mitral valvotomy (BMV) (n=17) or diagnostic study (n=5) detected transient catheter-related thrombi in 13 of 22 (59%) mitral stenosis pts (age 60±14yrs). Ten thrombi occurred in the right atrium (RA) and 6 in the left atrium (LA) (3 in both). A 5000 unit heparin bolus was routinely administered after transeptal puncture. Of the 10 RA thrombi, 2 appeared after the heparin bolus. Five of the 8 present before heparin did not recur. Additional heparin prevented recurrence in 4 of the 6 with LA catheter-related thrombi. LA thrombi were common in pts with a larger left atrium ($p = .02$). Both multiple thrombi and left atrial thrombi were more common in pts with a moderate to high degree of LA spontaneous echo contrast (SEC) (6/12 vs 0/10 and 5/12 vs 1/10). SEC was graded as none (n=4), mild (n=6), moderate (n=9) or severe (n=3). For those with successful balloon valvotomy (n=17), the degree of SEC decreased compared to baseline in 14 (82%) pts. SEC was detected in 15/17 pts pre BMV and in only 9/17 after BMV. There were no clinical embolic events.

Conclusions:

- 1) Despite the rare occurrence of catheter-related embolic events, transient thrombi occur commonly during transeptal catheterization in patients with mitral stenosis.
- 2) Left-sided catheter-related thrombi occur more frequently in subjects with left atrial spontaneous echo contrast.
- 3) Successful mitral valvotomy results in a significant decrease in the presence and degree of SEC.