

## Poster Presentations — B21

### Aortic Atheromatous Disease in Patients Undergoing Coronary Artery Bypass Grafting

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**Introduction:** Aortic atheromatous disease can produce severe sequelae if they become dislodged during or after surgery. These sequelae may become manifest in the intensive care unit postoperatively. Consequences can include ischemic extremities, cerebrovascular accidents, splanchnic ischemia, renal ischemia and renal failure. Coronary artery bypass surgery involving cardiopulmonary bypass and aortic cross-clamping can be especially provocative of aortic atheromatous injury. Transthoracic echo misses much of the aorta because of the distance, poor images due to poor acoustic access, and use of a low-frequency transducer. Transesophageal echocardiography offers better images of the aorta due to a much shorter distance, allowing use of a higher frequency transducer, and produces better images. Our cardiac anesthesia rooms utilize transesophageal echocardiography routinely in coronary artery bypass surgeries. However, the incidence of aortic atheroma is not known in our patient population. Therefore, we undertook to examine the incidence among our coronary artery bypass patients.

**Methods:** We prospectively studied 50 patients undergoing elective coronary artery bypass surgery involving cardiopulmonary bypass and aortic cross-clamping. Patients were examined following induction of general anesthesia using Accuson Sequoia TransEsophageal Echocardiography Multiplane probes. Frequency of 7 megahertz was used for examination of the aorta. Following acquisition of aortic valve view, a multiplane image at approximately 120 degrees was obtained to assess the ascending aorta. Then an angle of zero degrees was used to examine the descending aorta. The probe was slowly withdrawn to serially examine from the descending aorta up through the distal transverse arch until acoustic window was lost, in the mid transverse aorta. Atheroma was classified according to the schema of Kronzon with normal aorta being Grade I, flat intimal thickening being II, atheroma protruding less than 5 mm being III, atheroma protruding more than 5 mm being Grade IV, and any mobile atheroma being a Grade V.

**Results:** Eighteen (18) of 50, or 36%, of coronary artery bypass patients had aortic atheromas seen with transesophageal echocardiography. Thirty-one (31), or 62%, of patients had Grade I, or normal aortas. Twelve (12), or 24%, had Grade II atheromas. Four (4), or 8%, had Grade III. One (1), or 2%, had Grade IV. Two (2), or 4%, of patients had Grade V atheromas.

Grade	I	II	III	IV	V
Number pts	31	12	4	1	2
Percentage	62	24	8	2	4

**Discussion:** Recent papers have reinforced the important role of aortic atheroma in complications following coronary artery bypass surgery involving cardiopulmonary bypass and aortic cross-clamping. Potential mechanisms include plaque dislodgement by the aortic cannula, overaggressive palpation of the aorta, aortic cross-clamping, anastomosis of proximal vein grafts, or the "sandblasting" effect of high-pressure cannula flow against the aortic wall. Knowledge about the degree of atheroma in the aorta can help guide selection of the site of cannulation and cross-clamp. Quantifying the amount of atheroma with a grading system allows for quantifying atheroma at a particular institution, examining trends in atheroma seen over time, examining rates of neurologic complications and CVAs to grades of atheroma, comparing surgical techniques and cannulation sites with neurologic outcomes. Our series showed a significant rate of atheromas in coronary artery bypass patients: 38% of patients had atheroma between Grades II-V. Further research is needed to determine if grade and location of atheroma is related to neurologic outcomes.

#### References:

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- <sup>2</sup> Angiology 1998 Apr;49(4):267-73.
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- <sup>4</sup> Ann Thorac Surg 2000 Nov;70(5):1565-70.
- <sup>5</sup> Circulation 2000 Nov 7;102(19 Suppl 3):III263-8.
- <sup>6</sup> J Am Coll Cardiol 2000 Apr;35(5):1303-10.