Left Ventricular Aneurysm, Thrombus, and Embolism

To the Editor:

It was with interest that we read the articles by Simpson et al and Cabin and Roberts in which the incidence of thrombus and embolization and the possible effect of anticoagulation were discussed. We have recently presented a similar study based on data from 100 consecutive patients undergoing aneurysmacotomy. Like Simpson et al, we found a high incidence of thrombus (48 percent) and a low sensitivity of cineangiography in detecting thrombus (31 percent). Furthermore, our 26 chronically anticoagulated patients had an incidence of thrombus (50 percent) similar to that of the 74 nonanticoagulated ones (47 percent), again in agreement with the Simpson group’s data. However, when we related duration of anticoagulant therapy to the presence or absence of thrombus, we noted a significant difference, i.e., longer duration of anticoagulation was associated with absence of thrombus (p = 0.01). In fact, only one patient, who had received anticoagulation therapy for more than 13 months, had thrombus present at ventriculotomy. Also, there were five embolic events in these 100 patients; none occurred in a patient on long-term anticoagulant therapy. Although, as Simpson and colleagues state, “This low frequency of embolization would render it difficult to demonstrate a protective effect due to ... anticoagulation,” by the same token it does not exclude one. In contradistinction to the findings of Simpson et al, our data suggest that long-term anticoagulation may diminish the prevalence of thrombus in left ventricular aneurysm and, by doing so, would thus be expected to diminish the risk of embolization. We certainly agree, however, that the cineangiogram is a poor detector of mural thrombus, and we currently utilize two-dimensional echocardiography for visualization of left ventricular mural thrombus.

We agree with Cabin and Roberts that the clinical incidence of embolism in left ventricular aneurysm is low (approximately 5 percent) compared with embolism in dilated cardiomyopathy (18 percent). The explanations proposed by the above authors do not, in our opinion, adequately explain this discrepancy. In our experience with two-dimensional echocardiography, thrombus shape and attachment characteristics have not been dissimilar in aneurysm and dilated cardiomyopathy. Because most thrombi are apical (both in cardiomyopathy and in apical aneurysms), in neither condition do they encroach on the left ventricular outflow tract where blood flow might dislodge them. As for motion of the wall underlying the thrombus, this occurs in aneurysms also, but in a paradoxical fashion, whereas the wall is markedly hypokinetic in patients with cardiomyopathy.

What other factors could be responsible for the increased incidence of embolism in cardiomyopathy? Thrombus size tends to be larger in cardiomyopathy than in aneurysm, and perhaps total surface area is as important as shape. Age of thrombus may also be important—four of five embolic events in our series of 100 aneurysms occurred within six weeks of myocardial infarction. Perhaps some of the stimuli for thrombus formation in aneurysm are transient (e.g., tissue necrosis), so that little active propagation of thrombus occurs after the infarcted segment has healed, whereas in cardiomyopathy the major stimulus must be persistent apical stasis. This is entirely conjectural. Whatever the cause, patients with longstanding left ventricular aneurysm do seem to have a relatively low incidence of clinically recognized embolism.

When is anticoagulation indicated? The answer is not entirely clear. Because the majority of left ventricular aneurysms occur after anteroseptal infarction and aneurysm formation with thrombus occurs within days to weeks of the preceding infarction, and because risk of embolism seems highest at this time, we anticoagulate all patients (if no contraindications exist) for approximately two weeks after transmural infarction. Since two-dimensional echocardiography allows identification of patients who have aneurysm and thrombus, this capability may allow selection of individuals for long-term anticoagulant therapy.

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REFERENCES


Near Fatal Expiratory Ventilator Obstruction Due to Accidental Misassembly of Bourns Bear I External Flow Transducer

To the Editor:

The possibility for ventilator components being accidentally disconnected and improperly reassembled by untrained hospital personnel is a recognized hazard in an intensive care unit (ICU). We recently witnessed such an occurrence in one of our patients supported with the Bourns Bear I volume ventilator. The episode would have resulted in the patient’s death had the problem not been rapidly recognized and
the patient to the ventilator, but were unsuccessful until the problem was noted and the external flow sensor assembly was properly reassembled. She revived from this episode without apparent sequelae.

**DISCUSSION**

This case demonstrates the ease with which ventilator components can be disconnected and misassembled with potentially catastrophic results. The Bird 5537 one-way check valve is recommended by Bourns to prevent bidirectional flow and rebreathing by the patient. It may produce an expiratory obstruction if improperly connected to either the Bourns Silicone rubber adaptor (which happened to our patient) or to the Bennett MA-1 condenser pole (Fig 1).

Strategies to prevent repetition of our patient's incident were discussed with Bourns officials, and the following are recommended. Improper mating of the Bird 5547 check valve to the Bourns adaptor or to the MA-1 condenser can be prevented by placing a screw through the wall of the large end of the Bird check valve (Fig 1). Alternatively, the Bird 5536 one-way check valve can be used which directly connects the Bennett MA-1 condenser pole and the external flow transducer and cannot be misassembled to produce an expiratory obstruction.

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**REFERENCE**

1 Clinical Application Bulletin, Adult Volume Ventilator, CAB 2, Bourns Inc., Riverside, California, (76-502)

**Oblique Hilar Tomograms in Preoperative Staging of Carcinoma of the Lung**

To the Editor:

Oblique hilar tomograms were done in preoperative staging of carcinoma of the lung in 92 patients to see if they are useful in preoperative staging of lung carcinoma.

**MATERIALS AND METHODS**

Ninety-two cases of carcinoma of the lung whose histology was determined by transbronchial or needle biopsy had oblique hilar tomograms. Those who came to exploratory thoracotomy and had an adequate specimen were correlated as to the surgical clinical evaluation at operation, radiologic report of oblique hilar tomograms, and pathologic evaluation of hilar and mediastinal nodes.

**RESULTS**

There were a total of 20 cases available for evaluation. Of these, ten patients did not show any radiologic evidence of enlarged nodes preoperatively. All of these were found to be free of enlarged nodes at surgical exploration. However, two of these had positive nodes in the pathologic specimen. Of the two "false" negative tomograms, one was a node 2.5 cm in diameter and one was in the para-tracheal region, in an area not well demonstrated by oblique hilar tomograms.

Ten cases had radiologic report of the presence of adenop-

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**Case Report**

A 36-year-old woman was admitted to the City of Hope National Medical Center on Jan 11, 1980 for chemotherapy of advanced breast cancer. Her hospitalization was complicated by the development of sepsis and noncardiogenic pulmonary edema requiring treatment with gentamicin, clindamycin, dopamine and ventilatory support with positive end-expiratory pressure. Shortly after noon on Jan 29, the external flow transducer with an attached one-way check valve was accidentally dislodged from the ventilator while a portable chest x-ray film was being taken. The sensor assembly was inserted upside-down by ICU personnel over the Bourns Silicone rubber adapter producing an expiratory obstruction. The patient quickly became agitated, cyanotic, hypotensive and developed sinus arrest with an idioventricular rhythm at a rate of 45; she then lost consciousness. Due to the patient's distress and ventilator alarms, the patient was disconnected from the ventilator and ventilated with a Laerdal bag and 100 percent oxygen. Several attempts were made to return