relapsing seroconstrictive pericarditis,13 chronic post-
pericardiotomy effusion,14-18 and postinfarction con-
strictive pericarditis.16

Although there is some concern that use of cortico-
steroids in the early phases of myocardial infarction may
inhibit healing and enhance ventricular aneurysm for-
mation,17-18 limited courses of corticosteroids can be
relied upon to resolve Dressler's syndrome in the major-
ity of patients. Exceptions including a case of relapsing
Dressler's syndrome is reported to have required continu-
ing steroid therapy at 24 months of treatment.19

In our patient, corticosteroids in a moderate dose-
controlled the chronic Dressler's syndrome; however,
complications of the corticosteroids and progressive an-
ging necessitated consideration for surgical therapy. Al-
though not previously reported, the combined pro-
deries of pericardiectomy and coronary artery bypass
grafting have provided a satisfactory resolution of the
problems of chronic Dressler's syndrome, prolonged ste-
roid therapy, and angina. In addition to relief of symp-
toms, pericardiectomy was considered necessary to pro-
vide a safe bed for the saphenous vein bypass grafts.
There are no studies specifically addressing the influence
of Dressler's periarkitis on vein graft patency; however,
reports have suggested that both postoperative medi-
astinitis and postpericardiotomy syndrome diminish
aortocoronary graft patency.20-22 If the pericardium
had been left, there would remain the risk of recurrent
periarkitis, thereby placing the vein grafts at risk.

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Pulmonary Embolism During Mannitol
Therapy*

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A 25-year-old paraplegic woman suffered cardiopul-
monary arrest due to a major pulmonary embolism
during intravenous mannitol therapy. Although it is
possible that the mannitol caused an acute episode of
hemagglutination, we postulate that rapid administration
of mannitol caused dilation of her venous system,
creating a preexisting clot to break loose.

Pulmonary emboli have been noted to occur in many
settings: postoperative and postpartum periods, dur-
ing the use of anovulatory drugs, congestive heart fail-
ure, chronic pulmonary disease, fractures of the lower

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extremities, chronic deep venous insufficiency, prolonged bed rest, and carcinoma. We report a case of pulmonary embolism associated with intravenous administration of mannitol.

**Case Report**

A 32-year-old woman who had been a T3 paraplegic since a motorcycle accident two years previously was admitted for treatment of a decubitus ulcer. She was a known asthmatic since age five. A hysterectomy and left salpingo-oophorectomy had been performed for sterilization eight years previously at another hospital. Two years previously, the right ovary had been removed because of a neurogenic bladder. At the year previously, an iliac conduit had been placed because of a neurogenic bladder. In the present admission, medications included oxtriphylline, terbutaline, potassium iodide, amitriptyline, diocetyl sodium sulfosuccinate, bisacodyl suppositories, antacids, simethicone, oral nystatin suppositories (for monilial lesions), conjugated estrogens, meperidine, hydroxyzine, and cephalaxin. Bilateral resection of the femoral heads were done to aid in healing of her trochanteric decubitus ulcers. Subsequently, she complained of dysphagia with solid foods and liquids. Upper gastrointestinal roentgenographic study revealed an ulcer in a hiatal hernia. Potassium iodide was stopped. One week following the hip surgery, she became anorexic, and while refusing intravenous fluids, decreased oral fluids. Urine output decreased to 170 ml over 18 hours. Urine osmolality was 384 mOsm/kg with urine sodium level was 13 mEq/L and urine potassium value, 46 mEq/L. She was felt to be in a pre-renal oliguric state. A central venous pressure (CVP) line was placed. After rapid administration of 2 L of normal saline solution, only 40 ml of urine were obtained. Mannitol, 25 percent, was started via the CVP line. One ampule (12.5 gm) was given over a period of 12 minutes. A second ampule was immediately started when suddenly the patient became apprehensive and complained of dyspnea. Mannitol was discontinued. The CVP reading was 2 cm of water. Wheezing was not present. Within one minute, cyanosis occurred followed by cardiopulmonary arrest. The patient was promptly resuscitated and placed on a respirator. Chest x-ray film did not show cardiomegaly or pulmonary congestion. A ventilation-perfusion scan was compatible with a large pulmonary embolism to the left lower lobe (Fig 1). Focal defects in both upper lobes on the ventilation and perfusion scans were consistent with air trapping. Heparin was administered for anticoagulation, and her ulcer was treated with cimetidine and antacids. Renal function improved. Recovery was uneventful and the patient was maintained on long-term anticoagulation therapy.

**Comment**

This patient had many predisposing reasons to develop deep venous thrombosis, although none was ever clinically detected in her lower extremities. She was a paraplegic at prolonged bed rest, dehydrated, one week postorthopedic hip surgery, and on estrogen therapy. Factors which acutely change pressure relationships in veins, such as straining at stool or ambulating after long periods of immobilization, have been known to cause detachment of venous thrombi. It is postulated that sudden rehydration, plus rapid administration of mannitol, caused dilatation of her venous system, allowing a pre-existing clot to break loose, resulting in a pulmonary embolism.

Alternatively, it is conceivable that the mannitol caused an acute episode of hemagglutination as a source of embolism. In vitro hemagglutination has been shown to occur with the mixing of blood and 10 percent mannitol. However, this is an unlikely explanation of the clinical events in view of the localization of the embolism on the ventilation-perfusion scan and the abrupt onset of cardiopulmonary arrest as well as the patient’s predisposition to deep venous thrombosis.

Because of our experience, we feel that pulmonary embolism should be considered as a possible etiology for the sudden onset of cardiopulmonary symptoms in any patient being given mannitol or other substances that will expand intravenous volume, particularly in the setting where venous thrombosis may be present.

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