facilities. We thank Major-General P. N. Bardhan, Commandant, Armed Forces Medical College, Poona, for guidance, and Lieutenant-General C. C. Kapila, Director General, Armed Forces Medical Services, for permission to publish this report. We also wish to thank Lieutenant-Colonel Karpal Singh and Major M. J. Chakravorthi for psychiatric assistance in rehabilitating one patient (Case 2).

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Medical Memoranda

Malignant Pericardial Effusion: a Case for Treatment

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The purpose of this communication is to note the uncommon condition of secondary malignant pericardial effusion, producing tamponade, arising from metastasizing carcinoma of the bladder, and to describe its treatment.

CASE DESCRIPTION

A woman, aged 31 at the time of death, had a 19 months' history of haematuria with loss of weight and loin pain. Extensive carcinoma of the bladder having been demonstrated, radical total cystectomy was undertaken on 24 May 1962 with the removal of a right pyonephrosis. At this time hard glands extending beyond the aortic bifurcation were noted. A left ileal bladder was fashioned. Histology of the specimen showed squamous-cell carcinoma.

On 25 June she was readmitted because of loss of progress. Her only spontaneous complaint was of uriniferous vaginal discharge. She admitted to left chest pain, radiating to the neck and left shoulder. Marked dyspnoea was noted, with clinically clear lung fields. Seventy-two hours after admission the rising pulse rate was notable. The neck veins were bilaterally engorged to the jaw, and pulseless. The cardiac impulse was impalpable. Pulsus paradoxus was clearly demonstrated. The chest radiograph supported the diagnosis of pericardial effusion. The electrocardiogram showed ST elevation in the precordial leads, without T-wave inversion, and in standard leads I and II. There was no evidence of myocardial infarction. Pericardial paracentesis, via the xiphisternal-subcostal route, revealed a grossly blood-stained fluid, with a haemoglobin concentration of 5.2 g./100 ml. and packed cell volume of 22.5% ; 200 ml. was removed, which afforded considerable subjective and objective relief. By the following day, however, the situation had recurred, and a similar amount of fluid was aspirated. In both specimens unequivocal malignant cells were demonstrated.

On 29 June, under local anaesthesia, by the same route, a "polythene" tube of 1 mm. internal diameter was introduced into the pericardium with the aid of a trocar and cannula. Penicillin cover was instituted and maintained. The tube was left *in situ*, and drained up to 50 ml. of bloody fluid each 24 hours. X-radiation was begun on 2 July, a course of five daily treatments to the mediastinum being applied through a single field 20 by 15 cm. rectangular at 250 kV, half value layer 2 mm. Cu, giving a dose of 2,000 rad maximum skin dose and 1,000 rad minimum tumour dose. With this the drainage diminished and ceased, so that it was possible to remove the catheter on 13 July. She was symptom-free in reference to her cardiovascular system, but an indwelling catheter was necessary to control the fistulous vaginal leak, and she was

discharged home on 26 July. She was readmitted *in extremis* on 7 September 1962 and died 24 hours later.

Necropsy showed gross pyelonephritis in the remaining kidney, and widespread malignancy in the lymphatics, up to and including the mediastinal glands. The pericardial sac was obliterated by a loose fibrinous pericarditis, except for a small loculus at the apex which contained a few millilitres of bloody fluid. Microscopy of the pericardium showed viable cancer cells.

DISCUSSION

Carcinomatous effusion of the pericardium is not a common complication of disseminated malignancy, except in those arising from breast and bronchus (Enticknap, 1952). Treatment in the present case was imperative because of the distress caused by the tamponade. The overall prognosis was obviously limited, but since the tamponade was the presenting symptom-complex treatment of this was justifiable to gain time for a general surgical assessment. Treatment is not commonly mentioned in discussions of the condition because probably it is rarely of importance in the management of a terminally ill person with disseminated malignant disease. Radiotherapy and/or paracentesis of the pericardium is mentioned, "high voltage x-radiation may be of value . . ." (Raven, 1948). Paracentesis seems to have been used only as an intermittent procedure, except the employment (Thurber *et al.*, 1962) in one case of a pleuro-pericardial window after aspiration. On viewing our present case the effusion was producing an unpleasant life-threatening tamponade which demanded relief. Refilling and distress occurred with such rapidity that it was obvious that daily aspirations would be necessary. This would be unpleasant for the patient, and even if radiotherapy were to be a success some method of tiding over until its effect could be felt was obviously necessary. It was therefore agreed that radiotherapy should be undertaken, and the indwelling catheter used to cover the interim and the possibility of an exacerbation as a reaction to the radiotherapy.

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