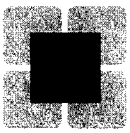

WILLIAM S. WILKE, MD, EDITOR

MANAGING THREE COMMON ONCOLOGIC EMERGENCIES

In patients with malignancy, a variety of tumor-related emergencies—structural, metabolic, and hematologic—can occur. Three of the more commonly seen entities are spinal cord compression, superior vena cava syndrome, and hypercalcemia. Familiarity with these disorders is essential in the care of the cancer patient.

SPINAL CORD COMPRESSION

Spinal cord compression due to malignancy usually occurs in patients with incurable disease and is responsible for serious morbidity (but not mortality). Once neurologic dysfunction develops it is rarely reversible, so the clinician must anticipate the diagnosis. Spinal cord compression most often arises from a metastasis which involves the vertebral body and extends to produce anterior epidural cord compression. However, hematologic neoplasms such as lymphoma and myeloma may result in epidural cord compression by direct extension from a paravertebral mass without bone involvement. The most common tumors responsible include lung cancer, breast cancer, prostate cancer, myeloma, and lymphoma.

The symptomatic hallmark of spinal cord compression is back pain associated with known spinal metastases. The presence of a symptomatic radiculopathy or myelopathy in a patient with malignancy is also a clear indication for further evaluation. However, other etiologies of myelopathic symptomatology in a patient with malignancy must also be considered (eg, intradural or intramedullary tumor, carcinomatous meningitis, radiation myelopathy, and paraneoplastic syndrome).

The neurologic examination is often normal in these patients, and either magnetic resonance spectroscopy or complete myelography is required for diagnosis. While most patients with spinal metastases and a radiculopathy or myelopathy will have evidence of epidural cord lesions, cord compression will also be found in a significant number of these patients with back pain alone.

Once myelopathic signs have developed the treatment of spinal cord compression is imperfect. Nonambulatory patients rarely recover. However, with early diagnosis, neurologic function can be preserved. Radiation therapy has proven as effective as surgery in most cases, and corticosteroids appear to have a short-term benefit. Surgical decompression should be reserved for patients in whom the diagnosis is unclear, the tumor is radio-resistant, progression occurs during radiotherapy, recurrence develops after completion of radiotherapy, or spinal instability is present.

In general, the key to a successful outcome in this neurologic emergency is early diagnosis.

SUPERIOR VENA CAVA SYNDROME

The superior vena cava syndrome is considered one of the classic oncologic emergencies. Although it has often been suggested that a diagnosis of this syndrome mandates immediate radiotherapeutic intervention for symptomatic palliation, recent reviews seriously question this tenet. Most patients with superior vena cava obstruction prove to have malignancy. Lung cancer, particularly small cell carcinoma, represents the majority of these cases. Malignant lymphomas are also commonly responsible. An increasing number of patients now develop superior vena cava syndrome as a result of the more frequent use of central venous catheters and pacemaker wires.

Patients with superior vena cava obstruction will usually present with complaints of neck and facial swelling, dyspnea, and cough. Physical examination is notable for distended jugular veins, prominent superficial venous collaterals and edema of the face, shoulders, and arms. Chest roentgenography may reveal mediastinal widening and a right hilar mass. Further delineation of the anatomic abnormality can be obtained with computerized tomography or contrast venography.

Although the clinical presentation of superior vena cava syndrome is often dramatic, death from superior vena cava obstruction alone is not well described. In general, the prognosis of patients with superior vena cava syndrome depends entirely on the prognosis of

their underlying disease. Symptomatic measures such as diuretics and elevation of the head are useful and will allow time for an accurate histologic diagnosis if the obstruction is neoplastic. Although recommended by some, radiotherapy prior to the histologic confirmation of malignancy is inappropriate and confusing.

Clinical improvement occurs in most patients, although this improvement may be due to the development of adequate collateral circulation. The treatment plan should be based on tumor histology and disease extent, not just on the presence of superior vena cava obstruction. Radiation therapy is most appropriate in those patients with non-small-cell lung cancer or other neoplasms that are unresponsive to chemotherapy. However, patients with small-cell lung cancer or lymphoma can be treated primarily with chemotherapy, with the expectation of a rapid response.

HYPERCALCEMIA

As many as 20% of patients with malignancy will develop an elevated calcium at some point during their disease course. The solid tumors that most frequently cause hypercalcemia are breast cancer and lung cancer. Multiple myeloma, lymphoma, other squamous cell neoplasms (esophagus, head, neck), and cancer of the kidney are also commonly associated with hypercalcemia.

Bone destruction from metastatic disease is the most frequent etiology of the hypercalcemia. A significant percentage of patients, however, have no evidence of bone metastases. In these patients hypercalcemia is felt to be "humoral" and may be mediated by a parathyroid hormone-like substance, a prostaglandin, or even a vitamin D metabolite. In multiple myeloma and lymphoma, direct osteoclast activation has been demonstrated. Rarely, in patients with metastatic breast cancer, a transient hypercalcemia may occur after initiation of hormonal therapy.

The clinical presentation of patients with malignant hypercalcemia is often dominated by the neurologic symptomatology. Malaise, fatigue, confusion and frank mental status changes are common. Gastrointestinal symptoms including nausea, vomiting, abdominal pain and constipation are frequent. Renal manifestations such as hyposthenuria, polyuria, and the resulting dehydration and azotemia represent the most serious manifestations of hypercalcemia and may result in death. Nephrocalcinosis may occur in long-standing hypercalcemia, but renal stones are uncommon in malignancy.

Management of hypercalcemia in patients with malignancy requires immediate rehydration with large volumes of isotonic fluids. Once rehydration has been accomplished, saline diuresis can be promoted to increase calcium excretion. Calcitonin has proven useful in the short-term management of malignant hypercalcemia, irrespective of etiology. Glucocorticoids, while successful in patients with myeloma, lymphoma, and breast cancer, have proven relatively ineffective in most other solid tumors. Mithramycin given in very low doses will result in a significant fall in serum calcium within 24 to 48 hours in most patients, and etidronate, a newly released hypocalcemic drug, has proven remarkably safe. In otherwise uncontrollable situations, dialysis has been used. Use of intravenous phosphates is not recommended.

The chronic management of malignant hypercalcemia is more problematic. If corticosteroids have been effective, they can be employed, although the side-effects may be limiting. Oral phosphate therapy is useful in some patients but may be difficult because of the cathartic effect of these agents. Oral etidronate is of unclear benefit. Specific antineoplastic therapy, if successful, is generally the best approach to this problem. Unfortunately, if antineoplastic management is unsuccessful, the prognosis is very poor. In such patients, frequent mithramycin or diphosphonate therapy may be necessary.

DAVID J. ADELSTEIN, MD
Department of Hematology and Medical Oncology
The Cleveland Clinic Foundation

SUGGESTED READING

Ahmann FR. A reassessment of the clinical implications of the superior vena caval syndrome. J Clin Oncol 1984; **2**:961–969.

Bajorunas DR, ed. Advances in the hypercalcemia of malignancy. Semin Oncol 1990; **17 (Suppl 5)**:(entire issue).

Murdy GR, Ibbotson KJ, D'Souza SM, et al. The hypercalcemia of cancer. Clinical implications and pathogenic mechanisms. N Engl J Med 1984; **310**:1718–1727.

Rodichok LD, Harper GR, Ruckdeschel JC, et al. Early diagnosis of spinal epidural metastases. Am J Med 1981; **70**:1181–1188.

Schraufnagel DE, Hill R, Leech JA, Pare JAP. Superior vena caval obstruction—is it a medical emergency? Am J Med 1981; **70**:1169–1174.

Wilson JKV, Masaryk TJ. Neurologic emergencies in the cancer patient. Semin Oncol 1989; **16**:490–503.