Symptomatic relief can occur within 2 weeks but is often temporary; therefore, systemic management should be initiated when indicated. Some tumors require surgical treatment. Persistent symptoms not relieved by chemotherapy or irradiation and those severe enough to warrant intervention before diagnosis can be successfully managed with endovascular stent placement with or without balloon angioplasty. For catheter-related thrombosis, anticoagulation is indicated; the decision regarding catheter removal should be individualized.

HYPERCALCEMIA

Epidemiology

Hypercalcemia complicates cancer in up to 10% of cases, occurring in both hematologic and solid malignancies. The most common etiologies are multiple myeloma, breast cancer, and squamous cell carcinoma.

Pathology

Mechanisms leading to hypercalcemia include osteolysis due to bony involvement and tumor production of parathyroid hormone–related protein (PTHrP), calcitriol, or cytokines. Even in the presence of cancer, primary hyperparathyroidism should be ruled out. Many cancer patients have low albumin and calcium levels that should be corrected.

Clinical Presentation

Early symptoms of hypercalcemia include constipation, polydipsia, polyuria, nausea, vomiting, and bradycardia. Most patients have signs of dehydration. Altered mental status is often a presenting symptom. The severity of symptoms depends on the time course over which hypercalcemia has developed rather than the absolute calcium level.

Treatment

Calcium supplements, vitamin D, and diuretics should be stopped. Aggressive fluid resuscitation with normal saline at 200 to 300 mL/hour should be started to maintain a high urine output. This should be done carefully in patients with compromised cardiac or renal function. These measures may be adequate for mild hypercalcemia, but moderate and severe hypercalcemias require further interventions.

Bisphosphonates are the preferred agents for management. They inhibit osteoclasts and bone resorption. Intravenous pamidronate and zoledronic acid are the two most commonly used bisphosphonates. In a pooled analysis, zoledronic acid was associated with a higher rate of calcium normalization and longer control. Calcium response to bisphosphonates can take a few days; therefore, if a rapid reduction is required for acute hypercalcemia, subcutaneous calcitonin (4 units/kg) can be given 2 to 4 times daily. Calcitonin works by increasing calcium renal excretion and reducing bone resorption. Other agents less commonly used in the management of hypercalcemia include gallium nitrate and glucocorticoids. Management should eventually include control of the underlying disease. Frequently, new or recurring hypercalcemia indicates disease progression or treatment resistance, which should be addressed with systemic therapy.

FEBRILE NEUTROPENIA

Definition

Febrile neutropenia is a common complication of chemotherapy. It is defined as a temperature of 100.4° F (38° C) in the setting of a neutrophil count lower than 500/μL (or lower than 1000/μL with a predicted decrease to less than 500/μL in the next 48 hours). The risk of febrile neutropenia increases with the intensity of the chemotherapy regimen and the severity and duration of neutropenia. It can lead to treatment delays or interruptions, prolonged hospitalizations, decreased quality of life, and increased morbidity and mortality.

Treatment

Although most cases are managed in the hospital, low-risk patients may occasionally be successfully managed as outpatients. The American Society of Clinical Oncology (ASCO) has published guidelines for outpatient management that are based on a risk-stratified scoring system. All patients should have a history and physical examination to identify possible focal sources of infection. Attention should be given to the presence of mucositis and to swelling or induration and erythema around indwelling catheters as possible sources of infection. The initial workup should include a full chemistry profile, complete blood count with differential, blood cultures with at least one from each existing catheter tip, urinalysis, and chest radiography.

Once the diagnosis is established and cultures have been obtained, empiric treatment with broad-spectrum antibiotics must be initiated. Frequently, organisms are not identified on cultures. Therapy is usually directed to coverage of gram-negative bacteria with cefipime or piperacillin-tazobactam. If line infection or mucosal or skin infection is suspected, vancomycin is indicated. Prolonged neutropenia increases the risk of fungal infections, and antifungal agents should be considered. The duration of antimicrobial treatment is determined on an individual basis, but it should continue at least until there is evidence of bone marrow recovery (usually a neutrophil count >500). Prophylaxis with myeloid growth factors such as filgrastim or pegfilgrastim can reduce the risk of febrile neutropenia from chemotherapy and is used in high-risk settings.

CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING

Definition

Nausea and vomiting are perhaps the most feared adverse effects of chemotherapy. Chemotherapy agents are stratified according to risk of emetogenicity (Table 61-3). Nausea and emesis are typically categorized as acute, delayed, or anticipatory. Acute nausea and vomiting occurs during the first 24 hours of treatment, whereas delayed nausea occurs 2 to 5 days after treatment initiation. Patients with high levels of anxiety or prior poor control of nausea may also suffer symptoms in anticipation of starting treatment. The risk of chemotherapy-induced nausea and vomiting is greater in younger patients and in women. A history of increased alcohol consumption is associated with lower risk.