

## Palliative surgery for cancer pain

Mr Rivera, right-handed and aged 91 years, had been living an active, independent life until he lifted a gallon of milk and noted severe pain in his right arm. He had a previous known diagnosis of Paget's disease. A radiograph revealed a nondisplaced fracture, and he was placed in a cast. Follow-up radiographs demonstrated a nonhealing fracture and an enlarging mass in this region. Biopsy revealed a high-grade osteosarcoma. Further diagnostic studies demonstrated bilateral pulmonary metastases. Given his advanced age, palliative parenteral chemotherapy was not offered. Pain management for severe arm pain was initiated.

Despite the many advances in the treatment of cancer in the past several decades, it remains the second leading cause of adult death in the United States. More than

550,000 Americans are expected to die of cancer in 2001, and the need for optimal management of symptoms for these patients cannot be overemphasized.<sup>1</sup>

Pain is commonly associated with cancer, occurring in about one quarter of patients with newly diagnosed cancer and in nearly three quarters of cancer patients with advanced disease.<sup>2</sup> Unrelieved pain is one of the symptoms that cancer patients fear most. The Institute of Medicine emphasized the importance of the relief of pain and other symptoms in a report on end-of-life care in the United States.<sup>3</sup> The report stressed that too many people suffer from pain or other symptoms that could be prevented or alleviated with our existing knowledge of therapy. In this article, we discuss surgery as a therapeutic option in the management of pain in cancer patients.

### SEARCHING AND APPRAISING THE LITERATURE

We searched MEDLINE from 1985 through 2001 combining the key words *palliation* or *palliative* with *neoplasm*

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### Summary points

- The management of cancer pain is an essential element of comprehensive cancer care
- Cancer pain treatment is multidisciplinary; priority should be given to treatments that provide maximum pain relief with the least side effects and least invasiveness
- Surgery is an important treatment approach for certain types of cancer pain
- The decision to operate for pain relief depends on the operation's likely effectiveness, the surgical morbidity, and the durability of surgically derived pain relief
- We need high-quality prospective studies, using patient-reported outcome measures, to assess whether palliative surgery controls symptoms

and *amputation*. Limiting our search to human studies and studies in the English language, we identified 60 articles, most of which were case reports. There were several small case series, but no randomized trials. We focused our literature review on clinical series of surgeries performed with palliative intent. We also used consensus statements from the Institute of Medicine regarding end-of-life care and palliative care for cancer patients.

### What is the most appropriate management of cancer pain?

Recently published guidelines for the management of cancer pain emphasize a deliberate plan of pain assessment, pain quantification, and short-term reassessment of pain after appropriate therapy has been selected and delivered.<sup>4</sup> A comprehensive assessment of pain is important because it guides the initial therapy. Appropriate drug selection, dosing, and timing of reassessment are all directed by the initial severity of a patient's symptoms. The initial assessment of cancer pain must include a careful history of the pain—including intensity, location, quality, and associated symptoms—and an assessment of psychosocial issues that may play a role in the patient's pain condition.<sup>5,6</sup>

Mr Rivera's eventual pain management included long-acting opioids delivered through sustained-release transdermal patches and shorter-acting opioids for breakthrough pain, combined with nonsteroidal anti-inflammatory drugs. Despite a multidrug regimen, the pain due to his progressive tumor remained uncontrolled. A trial of palliative radiation therapy was initiated but was unsuccessful, and massive arm swelling ensued. He had increasingly severe pain despite escalating doses of analgesic agents and daytime drowsiness and severe constipation that he attributed to his pain medications. He suffered

from worsening fatigue related to the weight of his arm and inability to sleep at night due to both pain and daytime drowsiness. Physical examination confirmed no useful function of his right arm or hand. He was referred for surgical management.

### When does cancer pain require a palliative surgical approach?

The two primary indications for surgical intervention for pain relief in advanced malignant lesions are, first, when other less invasive means have failed or, second, when selected therapy results in intolerable side effects. The selection of patients for palliative surgery involves a careful assessment of symptom severity, whether the pain is refractory to less invasive pain management modalities, the likelihood that surgery will alleviate the pain, the suitability of the patient to tolerate surgery, and the possible morbidity of the proposed operation. For patients who have advanced cancer, their anticipated life expectancy and the expected disease course should be considered. For example, some patients with indolent long-standing metastatic disease—such as metastatic carcinoid—may have an anticipated survival time measured in years. Such patients may be well suited to the aggressive management of disease symptoms because of their long life expectancy and their excellent performance status. On the other hand, patients with more aggressive tumors—such as those with pancreatic cancer—have a more limited survival time in the presence of metastatic disease, and a more cautious approach to surgical intervention is warranted. A surgeon's willingness to contribute to effective pain management needs to be balanced against the likelihood of an often-frail, nutritionally compromised patient recovering uneventfully from possibly major surgery.

In the past few decades, health professionals providing end-of-life care have generally advocated for noninvasive, simple approaches to symptom management, as exemplified by hospice care. Although a laudable goal, more recent palliative care literature has acknowledged that invasive treatments may in some circumstances be the best choice for providing optimal patient comfort.<sup>3</sup> Palliative care now increasingly encompasses both invasive and noninvasive approaches to achieving optimal patient relief.

### What evidence supports the use of palliative surgery for pain treatment?

Advanced malignant diseases of the arm or leg that result in a painful, nonfunctional, or even inhibiting limb, as in this case described here, are rare. But aggressive management of so-called refractory symptoms of cancer of the limb, even in the presence of advanced malignancy, can result in symptom relief. Despite the commonly perceived

disability resulting from major amputation, removing a painful extremity can be done safely, and it can enhance the quality of a patient's remaining days of life. For example, palliative major amputations for patients with extensive fungating painful melanoma have been described.<sup>7</sup> Whereas median survival in this series was short at 5 months, the study demonstrated that 14 (93%) of 15 patients with such advanced disease were able to survive the operation and leave the hospital. Similarly, Malawer et al described the cases of 11 patients who underwent major palliative amputations for the management of advanced melanoma, sarcoma, and carcinoma; all had pain, and 8 were considered to have intractable pain.<sup>8</sup> In this series, all patients had previous treatment modalities directed at pain relief that had failed. All patients survived the surgery, and the authors reported dramatic pain relief in each case, with most patients surviving beyond 1 year.<sup>8</sup>

Palliative surgery involves the evaluation, management, and care of patients who undergo operations performed largely for symptom relief, with little anticipated effect on long-term survival.<sup>9,10</sup> Although patient survival is the optimal goal in cancer surgery, effective palliation of symptoms has received increasing focus of late as a primary end point of importance. In a survey of more than 400 surgeons with largely cancer-focused practices, surgeons estimated that palliative surgery made up more than 20% of all cancer operations.<sup>11</sup> Surgeons in this survey identified the goals of greatest importance in palliative surgery as achieving patients' pain relief, other symptom relief, and maintaining patients' independence and function. Improving patient survival was identified as the least important goal of palliative surgery. Increasingly, the importance of a careful evaluation of quality of life has been stressed in the field of oncology, and nowhere can this be emphasized more than in the field of palliative care.<sup>12-14</sup>

### What outcomes have been recorded for surgical palliation of cancer pain?

Palliative surgery is unlikely to affect traditional outcomes measures in cancer surgery—that is, improved survival time—particularly when gross disease is left behind or when surgery for symptomatic disease is performed in the presence of metastatic disease that is outside the field of the proposed operation. If the focus of palliative surgery is pain relief, perhaps more meaningful end points might be pain or symptom assessment using well-validated instruments that measure symptom severity and distress. Today, despite increasing calls for attention to quality-of-life assessment, few surgical oncology studies effectively report on symptom alleviation with surgical interventions.

For major extremity amputation as a palliative procedure, only a few reports have carefully evaluated quality-of-life outcomes.<sup>15,16</sup> One such report described a series of



Pain relief after palliative surgery can improve quality of life in patients with advanced cancer

12 patients who underwent major amputation for highly symptomatic disease.<sup>16</sup> All patients survived the perioperative period, 9 (75%) were noted to have an improvement in Karnofsky performance status (a validated measure of a patient's functional abilities), and most were judged to have overall improvement in quality of life.

Unfortunately, few high-quality studies have been done that carefully evaluate symptom relief in patients undergoing palliative surgery. In a review of the palliative surgery literature from 1990 to 1996, Miner et al noted that the literature rarely reported quality of life (17%) or pain relief (10%) as end points of measurement.<sup>13</sup> Just 9% of the literature in this time frame was prospective. Surgical oncology literature in general has always focused on surgeries performed with the intent to cure, and outcome data other than survival are lacking.<sup>12</sup> Furthermore, even among literature focused largely on palliation alone, reports of outcomes have been physicians' impressions rather than patient-reported data. Physician-reported outcomes are less likely to reflect actual patient impressions when compared with patient-reported data.<sup>17</sup>

To determine whether patients benefit from palliative surgery, we need well-designed trials of patients with identifiable symptoms and quantified severity who undergo surgery for palliation rather than cure. These trials should have patient-reported outcomes as measures of therapeutic success. In the absence of such trial data, decision making for palliative surgery still needs to rely on retrospective data, and it should involve consultation with experienced surgeons.

Despite his advanced age and distant metastases, Mr Rivera's functional status before his illness was excellent, and he was thought to be a suitable candidate for a palliative amputation of the right arm. He underwent the procedure without complication and was discharged home in 3 days with arrangements for home occupational therapy and outpatient physical therapy. His postoperative pain requirements were greatly diminished, and opioids were discontinued 2 weeks after the operation at the patient's request. His self-reported symptoms of fatigue, daytime drowsiness, constipation, and anxiety had all diminished or were no longer present 6 weeks after the operation.

### CONCLUSION

Palliative surgery is an important component of comprehensive palliative care for cancer patients. The established goal in palliative treatment is improvement in quality of life and not survival. Patients often have limited anticipated survival time. In considering the goals of treatment, physicians need to carefully consider the severity of symptoms, the availability of nonsurgical treatment options, the likelihood of achieving effective symptom relief with surgery, anticipated durability of symptom relief, and the morbidity and even possible mortality of the surgical procedure planned. Palliative surgery ideally should have clearly defined therapeutic goals. Both patients and surgeons should be clear about the goals of treatment and the limitations of surgery when it is performed with palliative intent.

Surgery has long been used in the palliation of patients' symptoms, and it offers great potential to expand the treat-

ment options to patients with advanced cancer. Providing a wide variety of treatment modalities helps to assure high-quality end-of-life care.

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