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Preparation for Percutaneous Ablation Procedures

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Percutaneous tumor ablation is now commonly used to treat a wide range of focal tumors. Patients eligible for ablation often have complex medical problems that preclude them from receiving other treatments. The interventional radiologist needs to perform a careful clinical evaluation of each patient before the procedure to determine which patients are suitable candidates for treatment and to identify patients who may be at a higher risk for complications. The clinical consultation also provides an opportunity to prepare the patient for the ablation and to appropriately plan the procedure. In this article, we discuss key components of the consultation and concepts regarding patient evaluation and preparation for a tumor ablation procedure.
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Introduction

The treatment of cancer now involves multiple medical disciplines including medical oncology, radiation oncology, surgery, and interventional radiology. Individual cases should be discussed in a multidisciplinary manner involving all specialties so that an optimal treatment strategy can be decided upon. Once the decision is made to proceed with percutaneous ablation, the responsibility falls to the interventional radiologist to formulate a plan culminating in a safe and effective percutaneous treatment. Patients undergoing percutaneous tumor ablation may have a more advanced disease stage than those undergoing a potentially curative resection. In addition, many patients referred for percutaneous ablation have significant medical comorbidities often precluding more conventional open surgical resection. This article outlines some of the general and patient specific factors requiring consideration when planning a percutaneous tumor ablation on this sometimes challenging patient population.

Preprocedural Clinical Assessment

The decision to proceed with a percutaneous tumor ablation is ideally made in a multidisciplinary manner with an agreed-upon treatment plan. Most patients are then contacted directly following this to inform them of the consensus decision and the proposed treatment plan. At this point, it is crucial that the patient be referred to the interventional radiology clinic. Although patients often have some understanding of the planned procedure from their primary care physician or medical oncologist, this is their first opportunity to receive detailed background and more in-depth procedural information from members of the interventional radiology team.

The Clinic Consultation

The diagnosis of cancer is a life-changing event for the patient and their family. Many patients are referred for percutaneous ablation very soon following their initial diagnosis and it is worth investing time at the beginning of the consultation to empathize and gauge the patient's insight into their disease. Although the patient's medical imaging and brief clinical history have almost certainly been reviewed at the multidisciplinary meeting, this often is the first opportunity to obtain the patient's full medical history, note relevant physical examination findings, assess performance status, review current medications, and gauge overall treatment expectations. In our practice, we strongly encourage family members to accompany the patient during the clinic visit to both reduce anxiety and optimize the exchange and retention of information. Studies have shown the capacity to absorb educational information is impaired by the presence of fear or anxiety.[1] Very often it is the accompanying family member who would be taking care of the patient in the early postprocedure period and that person should be well informed of what to expect in normal recovery and be instructed to identifying the warning signs of potential

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complications. Some patients also find it of benefit to be shown their imaging studies to get a sense of the size and location of the lesion undergoing treatment. It is important to provide contact information at the end of the clinic visit to allow the patient easy access if further questions should arise or if an appointment needs to be changed at short notice.

Patient History

A detailed clinical history should be obtained for every patient. This includes a detailed evaluation of current symptoms and therapy, a review of systems, obtaining a medical and surgical history, review of all medications and allergies, and a review of family and social history. Some centers find the use of a printed clinic template helpful in adding structure to the consultation and ensuring no aspects of the history and physical examination are overlooked.[2] Evaluation for cancer-related symptoms should be performed, which includes both localized symptoms (such as pain from tumor invasion), symptoms related to dysfunction of the underlying organ (such as gastrointestinal bleeding or abdominal swelling in patients with hepatocellular carcinoma and cirrhosis or home oxygen requirements in patients with chronic obstructive pulmonary disease), and constitutional symptoms (fatigue, weight loss, or anorexia), as these are critical to staging the disease and identifying patients who would be good candidates for ablative therapies. A detailed oncologic history, including treatments the patient has previously received or is currently undergoing (such as chemotherapy), should also be obtained. Access to prior medical records and imaging studies, especially those from outside hospitals, are critical to evaluate response from previous systemic or regional therapies.

The review of systems can give clues to potential problems during or immediately after the ablation procedure. For example, a history of bladder outlet obstruction in an older man may prompt placement of Foley catheter during the procedure, whereas a history of rapidly developing ascites causing orthopnea may require a periprocedural paracentesis. Involuntary weight loss of 5% or more over a 6-month period in patients with cancer is associated with a shorter median survival time and should be documented if present.[3] A thorough medication history should be obtained, with a particular focus on drug or contrast allergies, anticoagulant, and diabetic medications (described later). A detailed review of the patient's surgical history is important with previous surgical resection in the target organ obviously relevant. In addition, patients with a previous bilioenteric anastomosis or urinary diversion procedure are at an increased risk of infectious complications following hepatic and renal ablation, respectively, and such patients may require a longer antibiotic prophylaxis regimen (described later).[4] It is important to ask about previous anesthesia and any associated adverse events should be recorded.

Performance Status

Oncologists use an assessment of performance status to grade the effect of the patient's disease and their overall functional status. It has an important role in gauging prognosis and in patient selection for a particular therapy. The Eastern Cooperative Oncology Group (ECOG) scoring system has 5 levels (Table 1).[5] Another commonly used score, the Karnofsky score, has 11 levels (Table 2).[6] The Eastern Cooperative Oncology Group system has a superior predictive value compared with the Karnofsky score for patient prognosis.[7] Overall, a falling performance status score is indicative of a poor prognosis and should be taken into consideration when an ablative procedure is planned in the context of the overall goals of care.

Physical Examination

This can be directed toward the ablation procedure. An important step in the physical examination is to identify patients in whom moderate sedation is unlikely to be sufficient for a safe and effective ablation procedure. Such patients would require monitored anesthesia care (MAC) or general anesthesia (described later). It is also important to evaluate the patient's airway and document a Mallampati airway score.[8] In our practice, a Mallampati score of IV requires an anesthesia consultation and likely general anesthesia with airway protection. A thorough cardiovascular examination is required to assess patient suitability for conscious sedation. The patient's American Society of Anesthesiologists physical status score should be determined (Table 3). An American Society of Anesthesiologists score of IV should also prompt an anesthesia consultation. Absent or diminished breath sounds could indicate a pleural effusion or atelectasis, conditions that could be optimized before the ablation procedure. Large-volume ascites impairing respiration may require a preprocedural paracentesis. Patients with cardiac disease should have their exercise tolerance classified by the New York Heart Association functional classification score (Table 4). The need for supplemental home oxygen or a continuous positive airway pressure (CPAP) mask should also be documented. Often, patients need to bring in their bilevel positive airway pressure (BiPAP) or continuous positive

Table 1 Eastern Cooperative Oncology Group (ECOG) Scoring System

Grade	Performance Status
0	Fully active and able to carry on all predisease performance without restriction.
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, for example, light house work and office work.
2	Ambulatory and capable of all self-care but unable to carry out any work activities; up and about more than 50% of waking hours.
3	Capable of only limited self-care, confined to bed or chair more than 50% of waking hours.
4	Completely disabled; cannot carry on any self-care; totally confined to bed or chair.
5	Dead.