

Radiofrequency Ablation Of Malignant Hepatic Tumors: Tips And Tricks

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Percutaneous radiofrequency ablation (RFA) has demonstrated significant advantages in the treatment of primary or metastatic malignancies confined to the liver. However, the relatively high recurrence and complication rates associated with RFA, especially for the treatment of tumors larger than 3 cm, restricted its application. Local tumor progression and major complications are closely related to tumor size, tumor number, and tumor locations. In this review, we propose some tips and tricks in RFA of hepatic tumor to enhance the therapeutic efficacy. Recent advances in the radiofrequency (RF) devices and technology have enabled the possible radical treatment of patients with difficult-to-resect liver tumors; however, some technical tips should be kept in mind. Choice of proper device, planning for a more effective therapeutic thermal zone, planning for a safe approach, and avoidance of adjacent extrahepatic organ injuries are some of the most important factors to achieve higher therapeutic efficacy, lower complication rate, and better overall survival rates. From technical point of view, an interventionalist should be aware of the difficult areas and the solutions or alternatives of approaching or treating the target lesions in these areas. Difficult areas can be locations difficult to access or locations in which interventional procedures carry relatively high risk of complications. Some areas such as caudate lobe, subphrenic regions (S8, S7 and sometimes S2) or Juxtaphrenic regions, can be difficult to approach. Lesions located in the regions adjacent to the bowel loops, gallbladder, especially lesions abutting the large bowel or duodenum/small bowel, carry higher risk of complications such as gallbladder rupture or bowel perforation. Centrally located lesions may abut the portal vein and bile duct, and RFA procedure may induce portal vein thrombosis or bile duct injury due to thermal or mechanical damage as well as alternations in blood supply of the biliary tract. To avoid these complications, various methods can be used, chemical ablation using local ethanol injection in addition to RFA may be helpful for treating lesions adjacent to the gallbladder. Artificial ascites with dextrose water can be effectively used to displace the bowel loops from the abutting tumors and reduce the risk of bowel perforation. When treating the centrally located lesions, combined therapy is preferred to avoid biliary injury, however, chemical-induced sclerosing cholangitis or partial obstruction of biliary tree can occasionally be seen weeks after the procedure. If it occurs, conservative therapy can be helpful in most cases. Careful pre-RFA imaging reading may avoid vascular injury. The needle tract should be treated with well controlled needle temperature and slow retraction of the needle after the ablation procedure for the target tumor; this may reduce the risk of needle-tract seeding or bleeding. With appropriate caution and techniques, ultrasound-guided RFA can be a safe and effective minimally invasive treatment of choice for malignant hepatic tumors.