colon cancer (13). Moreover, the risk of dissemination due to HCC has been higher with diagnostic biopsy alone than with percutaneous treatment (14-19).

There may have been cases of needle tract implantation in which patients have died before it was clinically discovered (20). It is thought that the mechanism of needle tract implantation may involve the transfer of cancer cells from the needle tip during the biopsy or backward flow of some of the cancer cells during needle removal and their adherence to subcutaneous tissue. Possible dissemination mechanisms along the puncture route include attachment of tumor cells to the puncture needle, transport by bleeding through the puncture route, and a rapid increase in intratumoral pressure (21, 22). Subcutaneous dissemination has been reported following RFA in which a cool tip unipolar needle was used (23). However, our approach involved the use of an expandable ablation needle after small bursts of RFA, with a route wider than the unipolar needle puncture diameter. This method prevented bleeding and tumor dissemination by performing aspiration biopsy while keeping the mantle needle fixed. Although there were some adverse effects such as pain, there were no cases of dissemination, and definitive diagnoses were obtained for all patients. Thus, despite being a seemingly complicated procedure, our method allows safe liver tumor biopsy.

In obtaining a diagnosis of liver lesions by biopsy, the sensitivity for HCC and metastatic liver cancer was 89.6-97.5% and 92.7-95.8%, respectively (10). Although false-negative cases have been reported (6.4%), the false-positive rate was low (0.08%). Therefore, it is crucial to bear in mind the possibility of false-negatives in the pathological results of liver biopsy.