Locoregional Therapy for Intrahepatic Cholangiocarcinoma

Case-Based Examples and Educational Review

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Introduction

Intrahepatic cholangiocarcinoma (ICC) arises from bile duct epithelial cells, and is the second commonest primary liver malignancy, acounting for up to 20% of cases. It is highly lethal due to advanced progression at presentation, with a median survial of 7.0 months. The only curative management is surgical resection, which is often unavailable at presentation, with one meta-analysis finding only 20.9% of cases eligible for such treatment. Although considerable geographical variance in disease prevalence exists, its incidence is presently rising worldwide alongside associated risk factors of cirrhosis, metabolic syndrome, viral hepatitis, biliary tract disease, and liver flukes. Interventional radiologists play an important role in the downstaging and management of ICC, often via locoregional therapies (LRTs) such as microwave ablation (MWA), transarterial chemoembolization (TACE), and transarterial radioembolization (TARE). We present two cases of ICC each treated with either MWA and Y90 radioembolization.

Materials & Methods

Two patients with intrahepatic cholangiocarcinoma treated with microwave ablation and Y90 radioembolization were selected from our institution. Both patients were referred to the IR service for management as surgical resection was not an option.

Case 1: 46-year-old female with history of obesity and non-alcoholic steatohepatitis (NASH) cirrhosis with esophageal varices, portal hypertension, and splenomegaly was found to have a 3.1 cm liver lesion on MRI. After further evaluation and CT-guided liver biopsy, she was diagnosed with biopsy-proven T1N1M0 ICC in liver segment VII/VIII (LI-RADS category LR-M).

Case 2: 64-year-old male with history of nasopharyngeal carcinoma, Hodgkin's lymphoma, and NASH cirrhosis was found to have a 2.3 cm liver lesion on MRI. Subsequent CT-guided liver biopsy was non-diagnostic, and PET/CT revealed no hypermetabolic activity. Exploratory laparotomy and additional biopsy was performed, revealing adenocarcinoma with morphologic appearance consistent with intrahepatic cholangiocarcinoma.

Results

Case 1: Pre-procedural MRI abdomen showed a 3.1 cm peripherally enhancing lesion in liver segment VII/VIII. TARE was performed with Yttrium-90 (Y^{90}) glass microspheres; 33.24 mCi was delivered to the tumor via the right hepatic artery. No procedural complications. 3-month follow-up CT showed decrease in tumor size with no residual tumor or metastatic lesions.

Case 2: Pre-procedural MRI abdomen showed a 2.3 cm rim-enhancing lesion in liver segment II. MWA was performed at 100 Watts for 6 minutes in a 3.9 x 3.4 cm ablation zone. No procedural complications. At 1-month follow up, MRI revealed 4.2 x 2.4cm ablation cavity with no abnormal enhancement suggestive of residual disease. No new lesions were observed. At 14-month follow-up, MRI revealed unchanged size and appearance of ablation zone with no evidence of local recurrence. No intrahepatic or extrahepatic biliary dilation was observed.

Conclusion

Given many ICC patients present with advanced disease, curative resection is not feasible. Interventional radiology continues to play a pivotal role in disease management of these non-surgical candidates with LRTs such as MWA and TARE. No prospective randomized control trial has yet to compare outcomes of ICC treated with TARE vs MWA. In our case, the decision to proceed with TARE for case #1 and MWA for case #2 was made based upon discussion at our institutional multidisciplinary tumor board. Literature review reveals each procedure as safe and effective treatment options for non-resectable disease, with comparable downstaging and overall survival effects. Cases such as those presented here, in addition to small retrospective studies in the literature, demonstrate an ongoing need to further investigate the efficacy of these techniques to develop well-defined criteria on LRT selection and to identify superiority among LRTs for management of ICC.

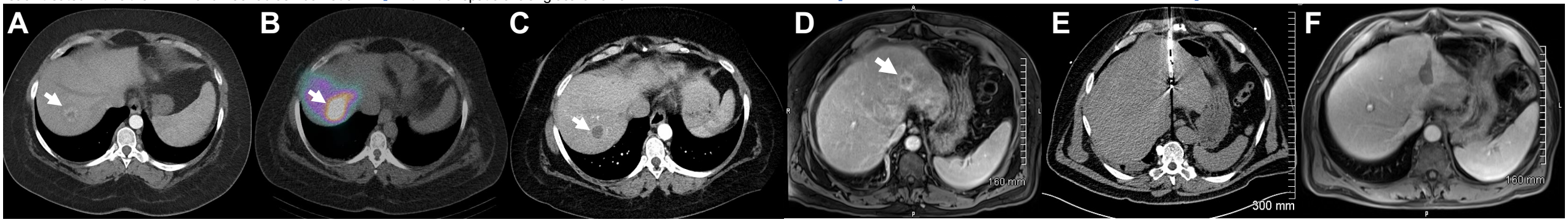

Figure 1. Case Images

A) CT abdomen with contrast (arterial phase) demonstrating an enhancing lesion in liver segment VII/VIII (white arrow); biopsy confirmed ICC
B) Fused SPECT/CT images demonstrate localized activity in segment VII/VIII (white arrow)
C) CT abdomen with contrast (arterial phase) demonstrating tumor cavity with no enhancement post-TARE (white arrow)
D) Initial MRI abdomen with IV contrast demonstrating segment II rim-enhancing liver lesion (white arrow)
E) Intra-procedure CT demonstrating microwave antenna within the segment II lesion
F) 14-month follow-up MRI abdomen with IV contrast demonstrating no residual or recurrent tumor

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