



Impact of Prior Hepatectomy History on Local Tumor Progression after Percutaneous Ablation of Colorectal Liver Metastases

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ABSTRACT

Purpose: To test the hypothesis that, given the current resection eligibility criteria for colorectal liver metastasis (CLM), prior hepatectomy would be associated with improved local tumor control and survival after percutaneous ablation of CLMs.

Materials and Methods: This single-institution retrospective study included 82 consecutive patients with 97 CLMs treated with ablation (radiofrequency ablation, microwave ablation, or cryoablation) from January 2005 to December 2014. Local tumor progression-free survival (LTPFS), recurrence-free survival (RFS) at any organ, and overall survival (OS) were calculated using the Kaplan-Meier method from the time of ablation and compared between patients with ($n = 49$) and without ($n = 33$) prior hepatectomy. Cox regression models were used to identify LTPFS predictors.

Results: Median overall follow-up period was 28 months (range, 4.5–132 months). Three-year actuarial LTPFS (patient level: 73% vs 34%, $P < .001$) was significantly higher in patients with than without prior hepatectomy, respectively. Similarly, 3-year RFS (23% vs 9.1%, $P = .026$) and OS (78% vs 48%, $P = .003$) were improved in patients with prior hepatectomy. At multivariate analysis, predictors of worse LTPFS were: no prior hepatectomy (hazard ratio [HR] 2.35, 95% confidence interval [CI] 1.02–5.45; $P = .045$), minimal ablation margin < 5 mm (HR 2.4, 95% CI 1.18–4.87; $P = .016$), and *RAS*-mutant tumor (HR 2.65, 95% CI 1.18–5.94; $P = .019$).

Conclusions: Prior hepatectomy for CLMs is associated with improved local tumor control after percutaneous ablation of post-resection-developed CLMs.

ABBREVIATIONS

CLM = colorectal liver metastasis, CSI = cross-sectional image, LTPFS = local tumor progression-free survival, OS = overall survival, RFS = recurrence-free survival

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INTRODUCTION

Up to 50% of patients with colorectal cancer present with or ultimately develop colorectal liver metastases (CLMs) during their disease course, which accounts for two-thirds of colorectal cancer-related deaths (1). Among the local curative therapies for CLMs, hepatic resection is considered the modality of choice with most recent series demonstrating a 5-year overall survival (OS) of up to 60% (1,2). Unfortunately, less than 20% of patients with CLMs are candidates for resection (3). Percutaneous liver ablation is another local therapy widely used for the treatment of CLMs and is traditionally reserved for patients who are not candidates for

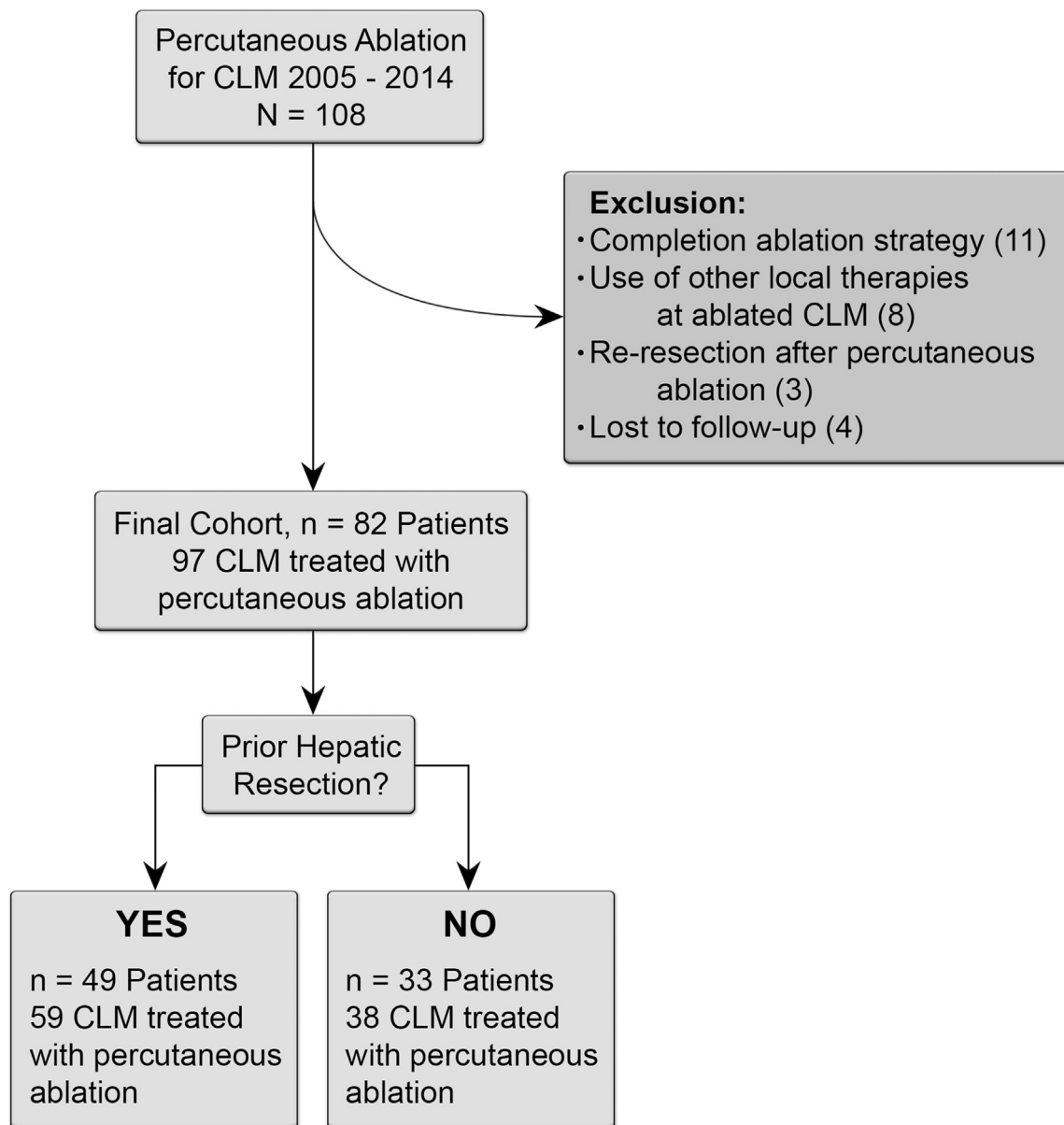


Figure 1. Flowchart diagram of patient selection and exclusion criteria.

surgery and for patients with post-hepatectomy recurrences. Most current series demonstrate 5-year OS rates ranging from 21% to 48% after ablation of CLMs (4–6).

In patients with CLMs, low rates of local recurrence (define as local tumor progression [LTP] for ablation) at the treated CLM are associated with improved OS rates. More recently, tumor biological factors have been recognized as prognosticators for local recurrence and survival in patients undergoing resection and ablation of CLMs (7–9). Likewise, the use of adjunctive measures such as neoadjuvant chemotherapy, portal vein embolization, and 2-stage hepatic resection, have been linked with improved outcomes after resection of CLMs (10–14), which might be attributable to selection of patients with more favorable tumor characteristics during assessment of the response to chemotherapy, growth of the future liver remnant, and

recovery after first-stage hepatectomy (15). Despite such findings, to date it is unclear whether such selection criteria for liver resection would ultimately also affect ablation outcomes of CLMs that develop after hepatic resection compared to ablation of CLMs without a prior history of hepatic resection.

Therefore, the aim of this study was to test the hypothesis that, given the current resection eligibility criteria for CLMs, prior hepatectomy would be associated with improved local tumor control and survival after ablation of CLMs.

MATERIALS AND METHODS

Study Population

This single-institution retrospective study was compliant with the Health Insurance Portability and Accountability

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