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TITLE:
Long Term Follow-Up of Patients of Intrahepatic Malignancies Treated with Iodine-125 Brachytherapy

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ABSTRACT BODY:
Purpose/Objective: The prognosis of patients with unresectable primary and metastatic liver tumors is extremely poor. We investigated the role of intraoperative Iodine-125 (I-125) brachytherapy as a treatment option.

Materials/Methods: Between 1989 and 2002, 64 patients with unresectable or residual disease after surgical resection for intrahepatic malignancies (metastatic colorectal cancer: 54, cholangiocarcinoma: 4, and metastatic non-colorectal cancer: 2) underwent permanent with I-125 brachytherapy to deliver 160 Gy (pre-TG 43) to the periphery of the target volume. A volume implant with Mick applicator was used for gross tumors while I-125 impregnated gel foam surface implant was used for microscopic tumor beds. Liver recurrence (defined as a measurable increase of implanted lesions or appearance of new lesions in the liver as determined by CT scan or laparotomy) and survival rates as a function of clinical and treatment variables were examined retrospectively.

Results: The median length of follow-up was 13.2 years. There was microscopic residual disease in 59% patients and gross residual disease was present in 41% patients. The overall 1, 3, and 5-year actuarial intrahepatic local control rates were 44%, 22%, and 22%, respectively with a median time to liver recurrence of 9 months (95% CI 6-12). The 5-year actuarial intrahepatic control was higher for patients with solitary metastasis (38%) than for those with multiple metastases (6%, p=0.04). The 1, 3, and 5-year actuarial overall survival rates were 73%, 23%, and 5%, respectively (median: 20 months; 95% CI: 16-24; longest survival 7.5 years). Overall survival was higher for patients with smaller-volume implants (p=0.003) and for patients without a history of prior liver resection (p=0.002). There was no mortality. Radiation-related complications were minimal.

Conclusions: Permanent I-125 brachytherapy is a safe and effective adjuvant treatment for unresectable intrahepatic malignancies. It is a simple technique with morbidity and mortality rates comparable to liver resection alone. Patients considered good candidates for I-125 brachytherapy include those with small volume implants, those without prior liver resection, and those with solitary liver metastases. In these select patients for whom curative surgical resection is not an option, I-125 brachytherapy is an important alternative to other locally ablative techniques and can provide long-term local control and increased survival.

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