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Yttrium 90 transarterial radioembolization of neuroendocrine liver metastasis

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BACKGROUND

To determine the safety and efficacy of Yttrium 90 (Y90) transarterial radioembolizations (TARE) for neuroendocrine liver metastasis (NLM) and elucidate factors that affect outcomes.

METHODS

Retrospective analysis of 39 patients with NLM in a single center who underwent 65 Y90 TAREs with glass or resin microspheres between April 2012 and December 2022. There were 17 male and 22 female with a mean age at time of treatment of 65.5 years (SD ±12.25), range 40-89 years). Primary anatomic site for tumor included pancreas (n=16), small bowel (n=7), rectal (n=4), lung (n=5), NET of unknown origins (n=4), colon (n=1), renal (n=1), and gastric (n=1). MSK- IMPACT next generation sequencing was collected when available. Survival outcomes were local tumor progression (LTP) and overall survival (OS) calculated based on time of treatment; these were measured via Kaplan-Meier method. Cox proportional hazards model and the log rank test were used to estimate differences between groups. Complications were graded via Common Terminology Criteria for Adverse Events (CTCAE).

RESULTS

Median local tumor progression free survival (LTPFS) was 12.43 months (95%CI: 6.8-17.97 months). Higher tumor grade was associated with lower LTPFS (p=.094). Stratified by anatomic site, LTPFS for lung tumors was the longest (median: 33.73 months; 95%CI: 0.4-NR months), followed by pancreatic (median: 17.17 months; 95%CI: 6.13-26.33 months), rectal (median: 11.07 months; 95%CI: 0.67-NR months), small bowel (median: 7.43 months; 95%CI: 4.17-NR months), other anatomic sites (median: 4.4 months; 95%CI: 1-11.03 months), and NET of unknown origins (median: 3.97 months; 95%CI: 2.87-NR months). Differences in LTPFS between anatomic sites were statistically significant (p=0.04). The median overall survival for all patients was 33.67 months (95% CI 15.67-57.2 months). Survival hazard ratio (SHR) for tumor burden >50% compared to tumors <50% of the liver volume was 2.23 (95% CI: 0.92-5.41, p=0.076). Prescence of DAXX mutation was associated with longer survival (SHR .57, 95%CI .19-.1.76, p=.329), while presence of TP53 mutations (SHR 1.78 95% CI .51-6.28, p=.369) and WT mutation (SHR 2.67, 95% CI .93-7.63, p=.068) were associated with worse survival outcomes. Two patients developed complications within 30 days. One patient developed fatigue, nausea and epigastric pain requiring hospital stay (grade 1), and another developed bilateral motor and sensory loss due to spinal infarct (grade 3).

CONCLUSIONS

Y90 radioembolization offers a safe and effective treatment option for patients with neuroendocrine liver metastasis. Higher tumor burden and tumor mass portends a poorer prognosis while DAXX mutation was associated with better outcomes following Y90 radioembolization.

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