

Dual-site synchronous dose administration in radioembolisation of hepatocellular carcinomas: a new technique to improve pre-treatment planning and reduce radiation exposure

SH Liu, KDD Leung, RK Mak, PP Ng, L Xu, CK Chow, HS Fung

Department of Diagnostic and Interventional Radiology, Queen Elizabeth Hospital, Hong Kong SAR

Objectives

- Radioembolisation with yttrium-90 (Y-90) has gained popularity in treating hepatocellular carcinomas
- Advancement in planning dosimetry using 99m-Tc macroaggregated albumin (MAA)
- Describe a new technique of placing two microcatheters in target positions before MAA/Y-90 administration

Methods:

- January 2023 to July 2024: 5 procedures
- Pre-treatment MAA: 4 ; Y-90 radioembolization: 1
- Radial approach: 3 ; Femoral approach: 2 (vascular closure device used)
- 6Fr Benchmark071 guide catheter + Excelsior1018 microcatheters x 2
- MAA or Y-90 injection sequentially one immediately after another

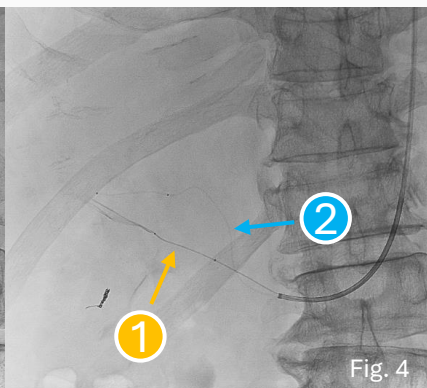
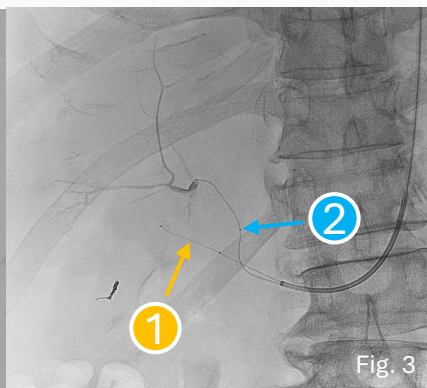
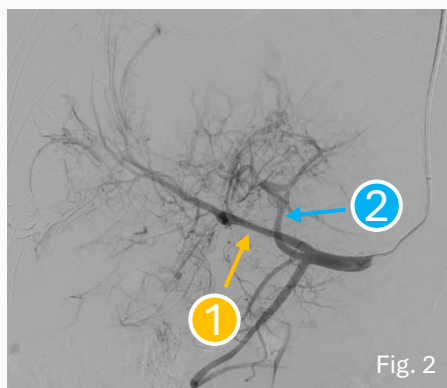
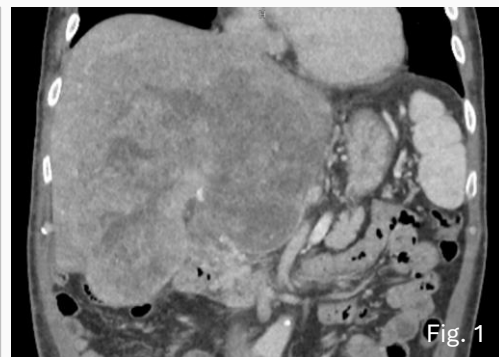


Figure. (1) CT showing huge HCC; (2) Catheter angiogram shows two dominant arterial feeders to the tumour; (3) & (4) Simultaneous selective microcatheters placement in the two feeders

Results & Discussion:

- All procedures are technically successful. No procedure-related complications.
- Selective cannulation to avoid non-target embolisation and to reduce radioisotope administration to non-tumour liver parenchyma. Selective cannulation can be difficult and time-consuming.
- With new technique, time between the two doses of MAA/Y-90 is shortened:
 - For MAA, minimise discrepancy of radioisotope decay of the two doses, improve dosimetry planning
 - For Y-90, reduce Bremsstrahlung radiation exposure emitted from patient to operators

Conclusion

- For tumours requiring two sites of injection, placing both microcatheters at target positions prior to MAA and Y90 administration is technically feasible.
- It can improve pre-treatment planning assessment and reduce radiation exposure to operating team.