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BACKGROUND

Arterial dissection during transarterial chemo-embolization (TACE) and Yttrium-90 selective internal radiation therapy (⁹⁰Y SIRT) has clinically significant impact on treatment outcome. Depending on its severity, advancing the microcatheter and guidewire past the segment of dissection into the true lumen may not be possible, necessitating alteration of the treatment approach or aborting the intended procedure. Also, flow-limiting dissection can alter flow dynamics of the tumor vascular supply, affecting the feasibility and effectiveness of these treatment modalities. This presentation reports a case series in the management of arterial dissections occurring during TACE and ⁹⁰Y SIRT for malignant liver tumors.

OBJECTIVE

To describe incidence rates and management strategies of arterial dissections in TACE and ⁹⁰Y SIRT for primary and secondary liver tumors.

METHODS

This retrospective review included 1377 hepatic angiographies performed between May 2010 and June 2015 in single center for TACE and ⁹⁰Y SIRT of malignant liver tumors. The management and treatment outcomes were collated. Follow-up imaging and angiogram results were recorded.

RESULTS

Twelve cases of arterial dissections (12/1377, 0.87%) were documented (see Figure 1). Three dissections (3/633, 0.47%) occurred during TACE, seven (7/449, 1.56%) during pre-treatment angiographies (PTA) for ⁹⁰Y SIRT, and two (2/295, 0.80%) during the treatment procedure of ⁹⁰Y SIRT. The preferred management strategy was to maneuver past the dissection and complete the procedure, which was achieved in six patients (50%). Angioplasty with stenting was performed in one patient to restore antegrade flow. In three patients, the procedure was held off for up to three months to allow the dissection to heal before repeating the procedure. A dissection that occurred during PTA was detected only when the patient returned for ⁹⁰Y SIRT. PTA was immediately repeated for this patient. The last patient opted for Sorafenib. Residual 50% stenosis was seen in one patient on follow-up hepatic angiography one month later, but he was otherwise asymptomatic. In the remaining patients, no residual dissection or significant clinical sequelae was observed on follow-up hepatic angiographies or imaging.

DISCUSSION

Arterial dissections is an uncommon complication encountered during transarterial locoregional therapy. As shown in our small series, completion of locoregional therapy was attempted if dissection was non-flow limiting and the operator was successful in manipulating microcatheter into the true lumen to optimal position. Angioplasty and stenting are reserved for cases where the dissection was extensive, and the risk of complete arterial thrombosis was deemed significant. Deferring treatment for up to three months in our small cohort did not show significant disease progression on subsequent locoregional therapy or interval imaging. Where disease progression is a concern, bridging therapy with systemic agents can be considered prior to another attempt at transarterial locoregional therapy. As Yoon et al (3) have shown, hepatic arterial dissections usually heal spontaneously without sequelae seen on subsequent transarterial procedures.

RESULTS

Figure 1. Breakdown of significant arterial dissections occurring during transarterial therapy for hepatocellular carcinoma. TACE transarterial chemoembolization; PTA pre-treatment angiography; ⁹⁰Y SIRT Yttrium-90 selective internal radiation therapy.

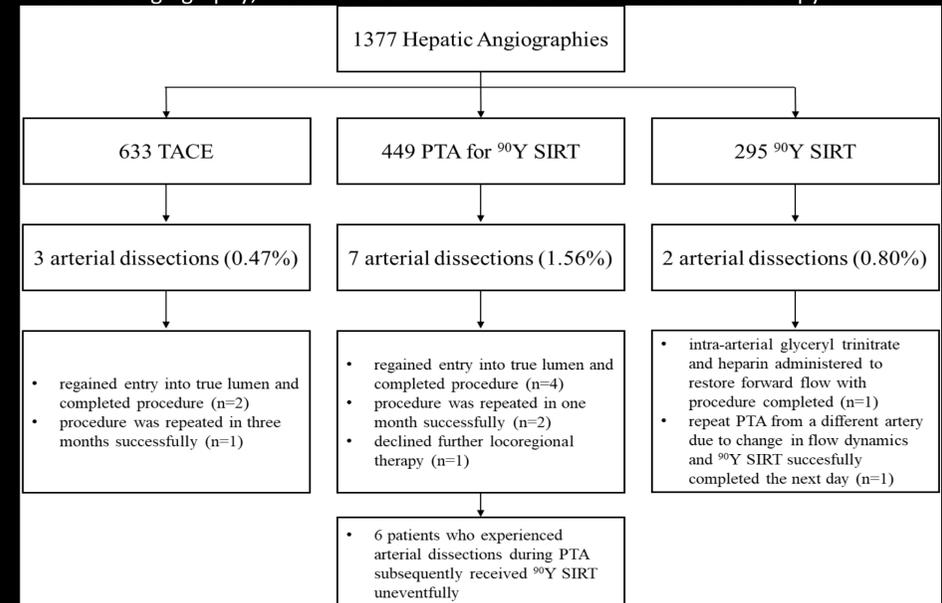


Figure 2. A Post-TACE angiogram showed dissection of the common hepatic artery; B Angioplasty with 6x40mm Mustang balloon catheter; C Restoration of antegrade flow.

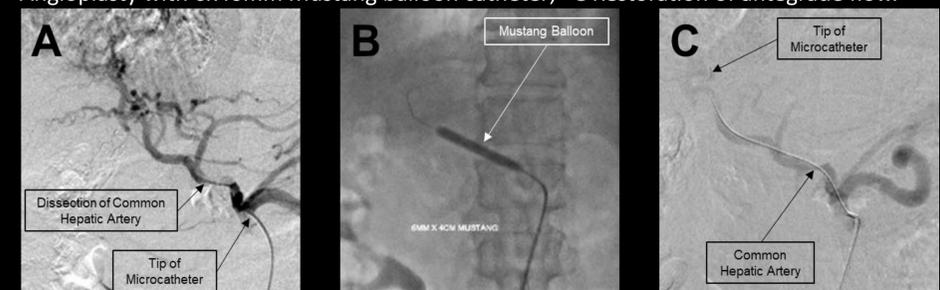
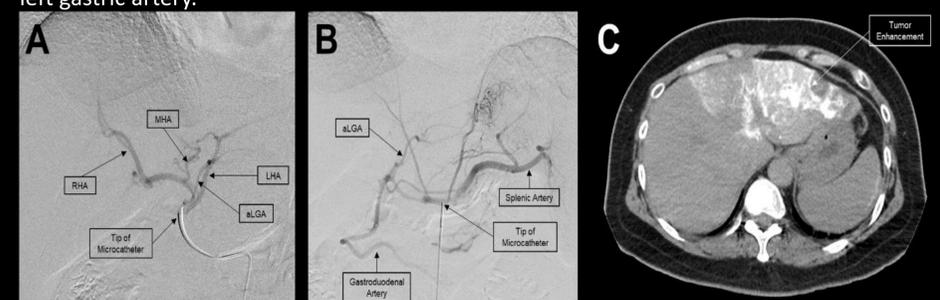


Figure 3. A Initial digital subtraction angiography during PTA for ⁹⁰Y SIRT; B Extensive dissection from celiac axis to origin of left and right hepatic arteries during PTA for ⁹⁰Y SIRT which was only detected when patient returned for ⁹⁰Y SIRT; C Intra-arterial CT demonstrating redistribution of flow to an accessory left hepatic artery. Technetium-99m macroaggregated albumin (99mTc MAA) study was performed immediately from the accessory left hepatic artery, and ⁹⁰Y SIRT was successfully performed the next day. RHA right hepatic artery; MHA middle hepatic artery; LHA left hepatic artery; aLGA accessory left gastric artery.



CONCLUSION

Arterial dissection is a rare but important complication encountered during transarterial locoregional therapy. Where possible, attempts should be made at completing locoregional therapy as this complication should not preclude a successful outcome. Hepatic arterial dissections usually heal within 3 months, and deferring of treatment can be considered.

ACKNOWLEDGEMENT

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