

# COMPLICATION OF TUMOR INFILTRATION OF APPENDIX WITH RESULTANT HEPATIC ABSCESS AND SEPSIS AFTER LIVER DIRECTED THERAPY

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## INTRODUCTION:

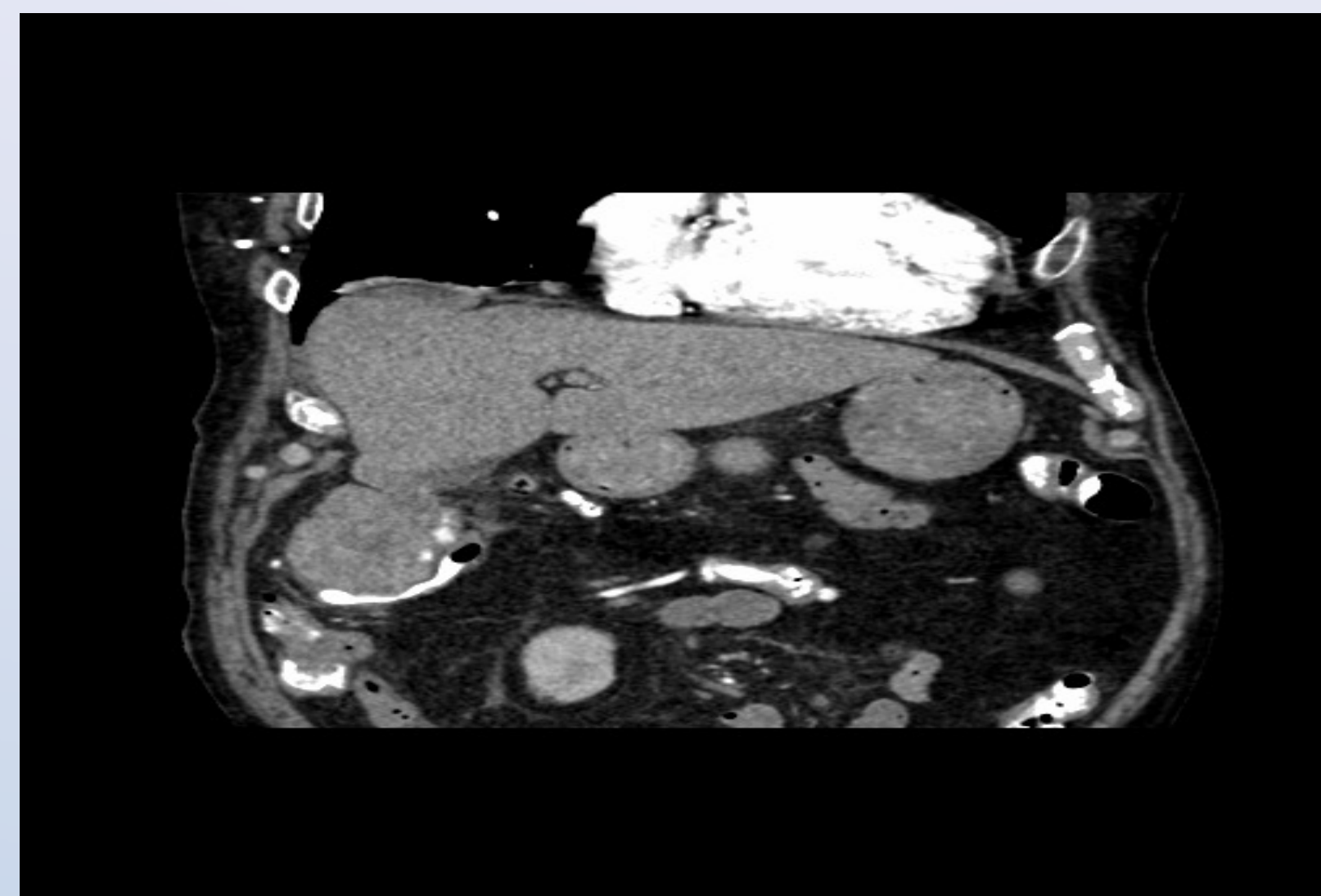
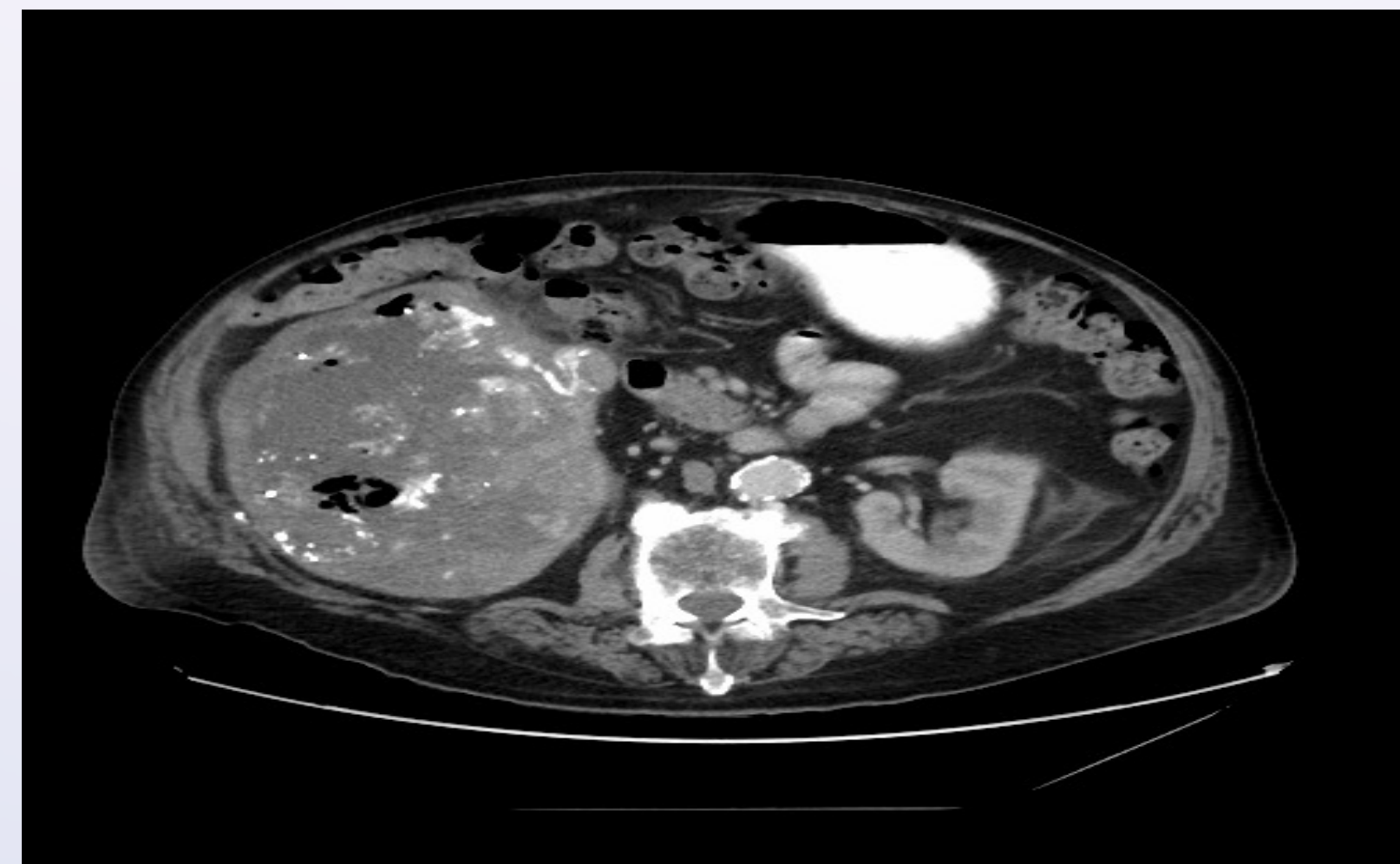
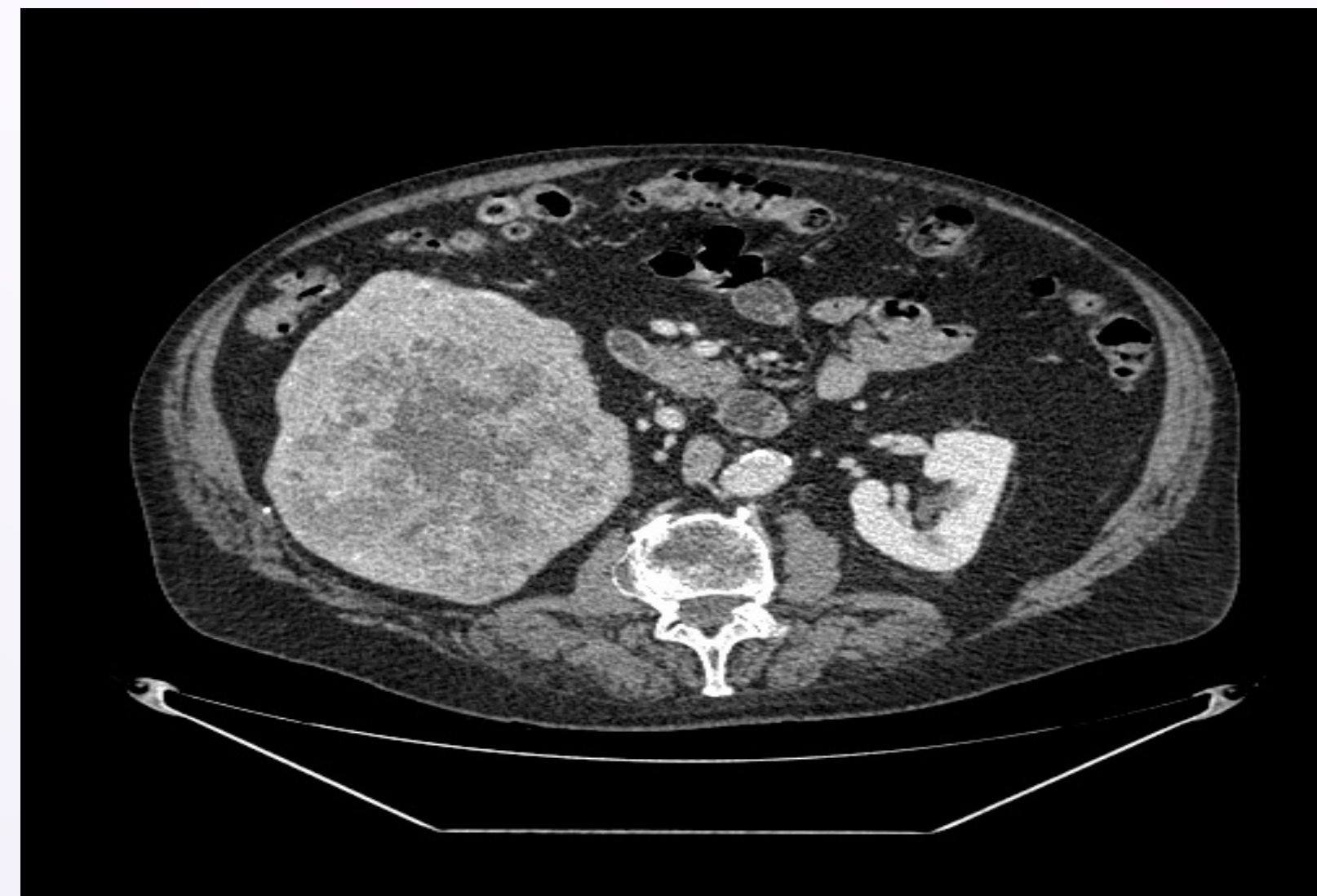
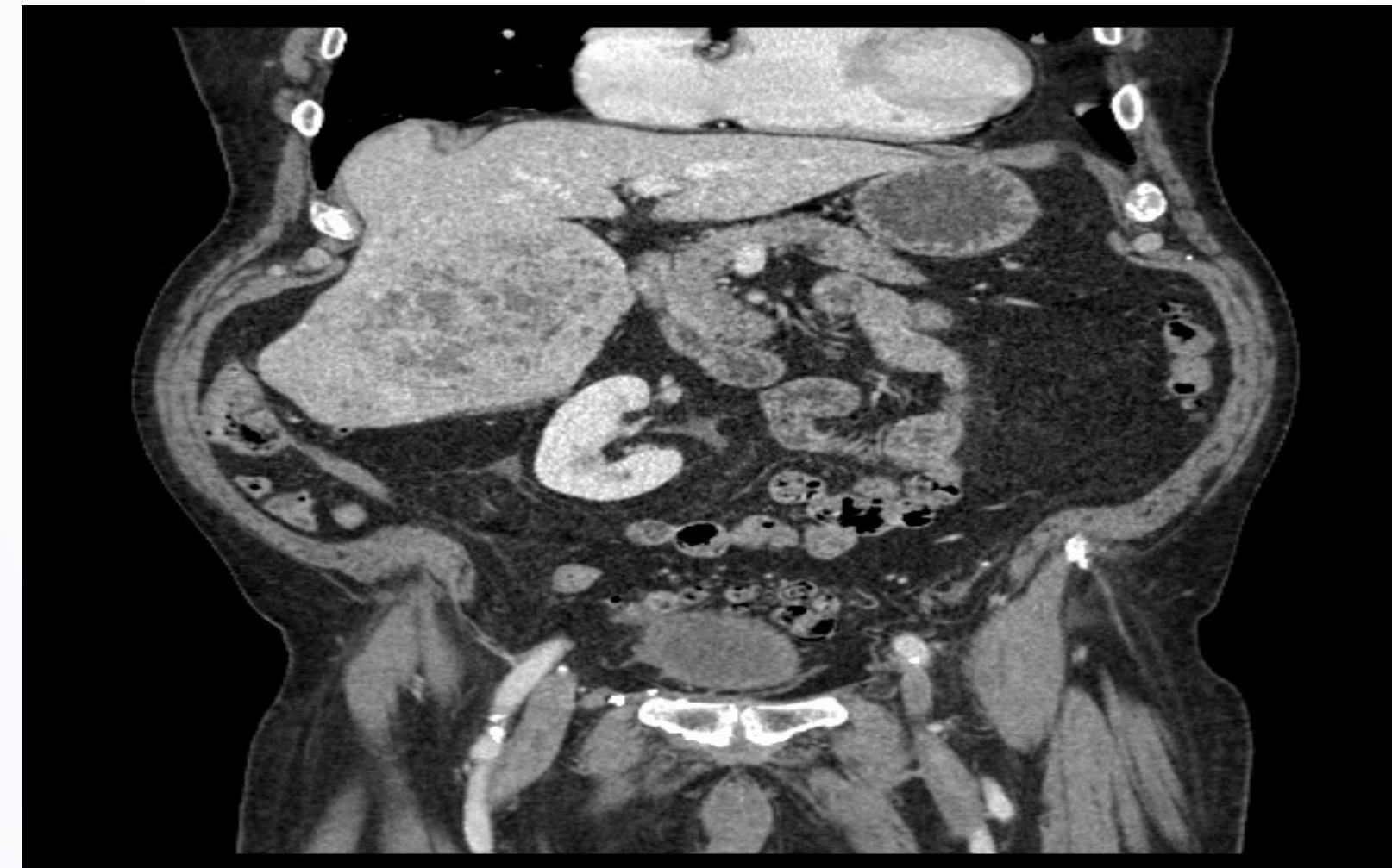
PRIMARY LIVER CANCER IS THE FIFTH MOST DIAGNOSED CANCER AND HEPATOCELLULAR CARCINOMA (HCC) ACCOUNTS FOR 75-95% OF ALL PRIMARY LIVER CANCER CASES<sup>1</sup>. SEVERAL STUDIES HAVE BEEN PERFORMED ON EXPLORING THE POTENTIAL OF COMBINATION THERAPIES TO TREAT ADVANCE STAGE HCC BUT THERE IS VERY LIMITED DATA ON COMPLICATIONS RESULTING FROM THESE COMBINATION THERAPIES. WE WOULD LIKE TO PRESENT A CASE OF ADVANCED HCC WHICH WAS TREATED WITH COMBINATION THERAPY INVOLVING TACE AND Y90 RADIOEMBOLIZATION RESULTING IN COMPLICATION OF TUMOR INFILTRATION OF THE APPENDIX WITH RESULTANT HEPATIC ABSCESS AND SEPSIS.

## CLINICAL HISTORY:

79 YEARS OLD MALE WAS FOUND TO HAVE ABNORMAL LIVER FUNCTION TESTS AND UNDERWENT IMAGING WHICH DEMONSTRATED A 12 X 16 CM PARTIALLY EXOPHYTIC MASS REPLACING THE RIGHT POSTERIOR LIVER. HE WAS ALSO FOUND TO HAVE ELEVATED AFP LEVEL. THERE WAS MASS EFFECT FROM THE TUMOR ON THE RIGHT KIDNEY AND ALTHOUGH THE TUMOR WAS NEAR THE BOWEL THERE WERE NO IMAGING FEATURES SUSPICIOUS OF INFILTRATION BY THE TUMOR. PATIENT WAS DEEMED TO BE A POOR SURGICAL CANDIDATE GIVEN EXTENT OF THE DISEASE ALONG WITH A RELATIVELY SMALL FUTURE LIVER REMNANT AND OPTED FOR LIVER DIRECTED THERAPY FOR LOCOREGIONAL CONTROL. FOLLOWING DISCUSSION AT A MULTIDISCIPLINARY CONFERENCE, DECISION WAS MADE TO ATTEMPT LOCOREGIONAL CONTROL VIA TRANS-ARTERIAL CHEMOEMBOLIZATION (TACE) AND Y-90 RADIOEMBOLIZATION. PATIENT UNDERWENT THREE SESSIONS OF TACE AND ONE SESSION OF Y-90 RADIOEMBOLIZATION WHICH WENT UNEVENTFUL.

## METHOD:

ROUTINE IMAGING SURVEILLANCE WAS PERFORMED FOLLOWING EACH THERAPY SESSION . NO SIGNIFICANT CHANGE IN TUMOR SIZE WAS NOTED. FOLLOW UP IMAGING, HOWEVER, WAS CONCERNING FOR INFILTRATION OF THE ADJACENT BOWEL AND APPENDIX BY THE TUMOR ALONG WITH DEVELOPMENT OF ABSCESS WITHIN THE TREATED TUMOR. THE PATIENT UNDERWENT MULTIPLE PERCUTANEOUS DRAINAGE PROCEDURES, HOWEVER, HIS CONDITION DETERIORATED, AND THE FAMILY DECIDED AGAINST ANY FURTHER INTERVENTIONS.



Coronal and axial contrast enhanced CT images demonstrate the tumor occupying the right posterior hepatic lobe and its proximity to the right kidney, bowel and appendix.

Axial and coronal contrast enhanced CT images following multiple sessions of TACE and y-90 demonstrate heterogenous appearance of the tumor without significant change in its size. There is presence of gas within the tumor suggestive of development of abscess. The appendix can be seen filled with oral contrast. There is loss of fat plane between the appendix and the tumor indicating tumor infiltration.

## DISCUSSION:

LIVER DIRECTED THERAPIES SUCH AS TACE AND TARE HAVE BEEN TOPICS OF INTEREST AND MULTIPLE STUDIES HAVE BEEN PERFORMED TO EVALUATE THEIR EFFICACIES, HOWEVER, THERE IS LIMITED LITERATURE ON THE USAGE OF COMBINATION THERAPIES AND THE RISK FOR BOWEL COMPLICATION. THE MOST COMMON COMPLICATIONS FROM TRANS-ARTERIAL CHEMOEMBOLIZATION (TACE) INCLUDE ACUTE CHOLECYSTITIS, LEUCOPENIA, HEPATIC ABSCESS, BILE DUCT INJURY, PULMONARY EMBOLISM AND LESS FREQUENTLY ACUTE PANCREATITIS. TRANS-ARTERIAL RADIOEMBOLIZATION (TARE) INVOLVES ARTERIAL INFUSION OF Y-90 IMPREGNATED MICROSPHERES. TARE MAY BE BETTER TOLERATED THAN OTHER FORMS OF THERAPIES BECAUSE OF ITS TARGETED DISTRIBUTION, MICRO-EMBOLIC NATURE, AND MECHANISM OF ACTION<sup>3</sup>. THE MOST COMMON ADVERSE EFFECTS ASSOCIATED WITH Y-90 RADIOEMBOLIZATION INCLUDE RADIOEMBOLIZATION INDUCED LIVER DISEASE (REILD), CHOLANGITIS, BILOMA, RADIATION PNEUMONITIS AND EXTRAHEPATIC RADIATION INJURY. THE MEAN SOFT TISSUE PENETRATION OF BETA RADIATION FROM Y-90 IS 2.5 MM WITH SOME STUDIES REPORTING MILD SELF-LIMITED ABDOMINAL PAIN FROM IRRITATION OF GASTRIC MUCOSA. HOWEVER, Y-90 CAN CAUSE DAMAGE TO NORMAL HEPATOCYTES AND SURROUNDING STRUCTURES IF NOT APPROPRIATELY USED. REDUCING THE DOSE OF Y-90 MICROSPHERES IN CASES WHERE THE TUMOR IS NEAR THE BOWEL MAY HELP MITIGATE RISK OF BOWEL COMPLICATIONS. ALTHOUGH IT IS POSSIBLE THAT A LOCALLY ADVANCED AND AGGRESSIVE TUMOR AS IN OUR CASE CAN INVOLVE NEARBY STRUCTURES SUCH AS BOWEL MAKING THE DEVELOPMENT OF INFECTED TUMOR INEVITABLE, OPTING FOR TACE IN THIS CASE GIVEN PREOPERATIVE IMAGING MAY HAVE BEEN THE SAFEST OPTION AS OPPOSED TO Y90 GIVEN THE METHOD OF ACTION. HOWEVER, BOTH TACE AND TARE CAN ACCELERATE TUMOR INVASION OF NEARBY TISSUES SECONDARY TO INFLAMMATION (TACE) AND RADIATION (TARE), AND MORE STUDIES ARE NEEDED TO DETERMINE WHICH MODALITY MAY BE THE SAFEST IN SUCH CASES.

## REFERENCES:

1. THULUVATH, PAUL J., CHAU TO, AND WASEEM AMJAD. "ROLE OF LOCOREGIONAL THERAPIES IN PATIENTS WITH HEPATOCELLULAR CANCER AWAITING LIVER TRANSPLANTATION." *OFFICIAL JOURNAL OF THE AMERICAN COLLEGE OF GASTROENTEROLOGY* ACG 116.1 (2021): 57-67.
2. QUINTO, A. M., NUTU, O. A., MANSO, R. S. R., ALONSO, I. J., PULIDO, J. C., MUNICIO, A. M., ... & ROMERO, L. C. J. (2018). COMPLICATIONS OF TRANSARTERIAL CHEMOEMBOLIZATION (TACE) IN THE TREATMENT OF LIVER TUMORS. *CIRUGÍA ESPAÑOLA (ENGLISH EDITION)*, 96(9), 560-567.
3. LAIDLAW, G. L., & JOHNSON, G. E. (2021, OCTOBER). RECOGNIZING AND MANAGING ADVERSE EVENTS IN Y-90 RADIOEMBOLIZATION. IN *SEMINARS IN INTERVENTIONAL RADIOLOGY* (VOL. 38, NO. 04, PP. 453-459). 333 SEVENTH AVENUE, 18TH FLOOR, NEW YORK, NY 10001, USA: THIEME MEDICAL PUBLISHERS, INC..