

LIVER SCANS AFTER ORTHOTOPIC HEPATIC
HOMOTRANSPLANTATION, BILIARY OBSTRUCTION,
AND DEVASCULARIZATION PROCEDURES

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RECENT CLINICAL EXPERIENCE in hepatic transplantation has proved liver scanning to be an important postoperative diagnostic procedure (1, 2). Information concerning homograft size and function was obtained and localized intrahepatic lesions such as infarcts could be identified and followed.

To investigate factors which might influence the appearance of liver scans, this procedure was performed in dogs before and after common bile duct ligation, arterial and portal devascularization, and orthotopic hepatic homotransplantation to treated or untreated recipients. Postoperative scans were obtained at least twice weekly. The radioisotope used was ^{99m}Tc-technetium sulfide in a colloidal suspension (3, 4); the intravenous dose being 800 microcuries per scan.

RESULTS

Group I (controls): Three dogs studied for 1 to 2.5 months after sham laparotomy had no change in the appearance of the liver scan or in liver function as measured with standard biochemical tests.

Group II (biliary obstruction): Two dogs were studied for 1 and 3.5 months respectively after common bile duct ligation. The scans remained normal except for the appearance of an anterocentral defect caused by the distended gallbladder.

Group III (dearterialization): Ligation and excision of the hepatic artery caused no change in the liver scans in three dogs studied for 1 to 3 months after operation.

Group IV (portal deprivation): In three dogs studied for two months after the construction of an Eck's fistula, the scans showed a progressive diminution in liver size and the development of areas with decreased isotope uptake.

Group V (unmodified rejection): Scans were obtained in five untreated recipients of orthotopic liver homografts. With the onset of

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rejection, as judged from liver function tests, there was a loss in the homogeneity and avidity of isotope uptake in the homografts; the terminal picture being that of a moth-eaten liver; large focal lesions did not develop.

Group VI (modified rejection): In seven more recipients treated with azathioprine, prednisone, and heterologous antilymphocyte globulin the same changes were found if rejection was not controlled. Again, large defects did not develop even in the terminal stages of the experiments.

Group VII (the chronically tolerated liver): Three dogs were studied 42, 40, and 16 months after receipt of orthotopic hepatic homografts. The first two animals had excellent and homogenous isotope uptake but their chronically tolerated homografts were smaller than normal dog livers; the homograft of the third dog had some unevenness and mottling of the scan but no filling defects.

CONCLUSIONS

The ^{99}M -technetium technique which is dependent on hepatic reticuloendothelial function provided essentially normal scans in livers injured by hepatic arterial or common duct ligation; a record of progressive atrophy after portal devascularization and an index of rejection in the transplantation experiments. Easily readable radiographic pictures could be obtained even in animals dying of hepatic failure, an insensitivity which may be of value in a clinical setting in which the study of anatomic contours is often of the greatest importance (1, 2). No examples were seen in the transplantations of this study of the segmental or lobar arterial thromboses which have been shown to have caused large filling defects in orthotopic human homografts (1, 2).

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