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Effect of Diversion of Bile into Vena Cava and Portal Vein in Dogs.

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It is definitely established that the dog may survive complete obstruction to the common bile duct for many months in comparatively good condition. On the other hand the injection or leakage of any considerable amount of bile into the peritoneal cavity causes prompt toxemia and death. The bile salts are apparently the principal toxic elements in the bile.[1] The present experiments were devised to determine the effect of diverting the biliary flow directly into the portal and systemic circulation. Dogs were used and all operations done under morphine ether anesthesia. In 3 experiments glass cannulae were placed in the common bile duct and left renal vein and connected by oiled rubber tubing. A nephrectomy was previously done. These 3 dogs died in 3, 5, and 7 days respectively. At autopsy a large amount of bile stained fluid was found in the peritoneal cavity and the rubber tube obstructed by a blood clot. Death was probably due to bile peritonitis. In 4 experiments the common bile duct was doubly ligated and divided, the gall bladder dissected free from its liver bed, and an anastomosis made between the fundus of the gall bladder and the vena cava, using a technique similar to that for the Eck-fistula. All 4 animals recovered from the anesthetic but remained weak and depressed. Two were unable to stand. All of these dogs died in 18, 22, 36, and 48 hours respectively. In 2 animals in which a preliminary cholecystectomy had been done 3 weeks previously and in consequence of which the common bile duct was greatly dilated, an anastomosis was made between the common bile duct and the portal vein in one and between the bile duct and vena cava in the other. Both of these dogs died in 20 hours. Since the authors have previously done over 50 Eck-fistula operations with less than 10% mortality it is not probable that death in these experiments is due to operative trauma, but rather to some toxic element in the bile, which is turned back into the blood. It seems probable that this substance (possibly bile salts) is not formed or does not escape from the liver in obstructive jaundice.

[1] Horall, O. H., and Carlson, A. J., *Am. J. Physiol.*, 1928, lxxxv, 591.