Computed tomography in liver cirrhosis

Liver cirrhosis is a disease with many different clinical and patho-physiological aspects, involving digestive and extra-digestive organs and systems. On the base of clinical signs and laboratory tests different scores entered in the common practice.

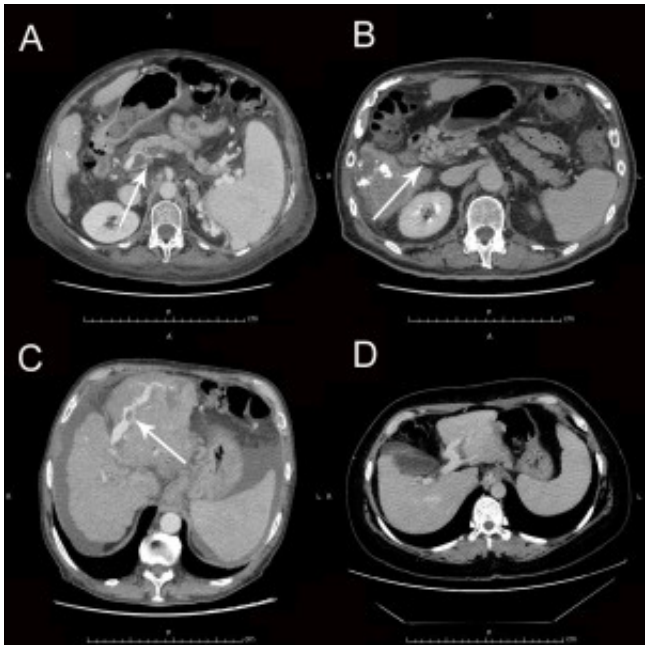

Fig. 1. CT axial images in liver cirrhosis. A) Thrombosis of the portal vein extended to the distal splenic vein (arrow), with splenomegaly and peri-splenic collaterals. B) Portal cavernoma, with multiple large collaterals at the hepatic hilus (arrow), in a patient with hepato-carcinoma and previous lipiodol treatment. C) Thrombosis of the left branch of the portal vein, in its intra-parenchymal tract. D) Bent dilatation of the left main portal branch, with a scant intra-hepatic portal tree.

We observed that also the most recent and widely used score systems do not consider morphological signs that today can be easily accessed through the common imaging tools: ultrasound, computed tomography (CT) and magnetic resonance. Many studies concerned the intrinsic morphology of the liver and its pathology, but not equally the morpho-dynamic aspects of the portal venous system. From a practical point of view we remark that the clinical outcome of many cirrhotic patients often depends from complications related with pathology the portal venous system, always admitting a close correlation between diseases of the liver and of the portal venous system. On the other hand, in predicting complications and risk factors after a surgical procedure, also this aspect of liver cirrhosis must be evaluated.

Here we stress the importance mainly of the CT, because this diagnostic tool is today largely applied, and permits at the same time morphologic and dynamic evaluations.

We underline some pathological conditions.

Firstly, CT evaluates, besides hepatic lesions, morphology of the hepatic veins and of the intra-hepatic portal branches. In case of lesions of these structures, difficulties of blood outflow to and from the liver can be predicted (Fig1). Particularly, a concomitant or impending condition predicting a hepatofugal blood flow from the liver can be demonstrated. This could take place in a short period of time and also after an intervening clinical event, as surgical procedure.

Secondly, in case of evident portal hypertension, congestion of the porto-mesenteric trunk, and of its tributaries, suggests the strong possibilities of secondary gastro-esophageal varices, and of their possible bleeding. This situation demand the prompt recourse to an upper digestive endoscopy (Fig.2).

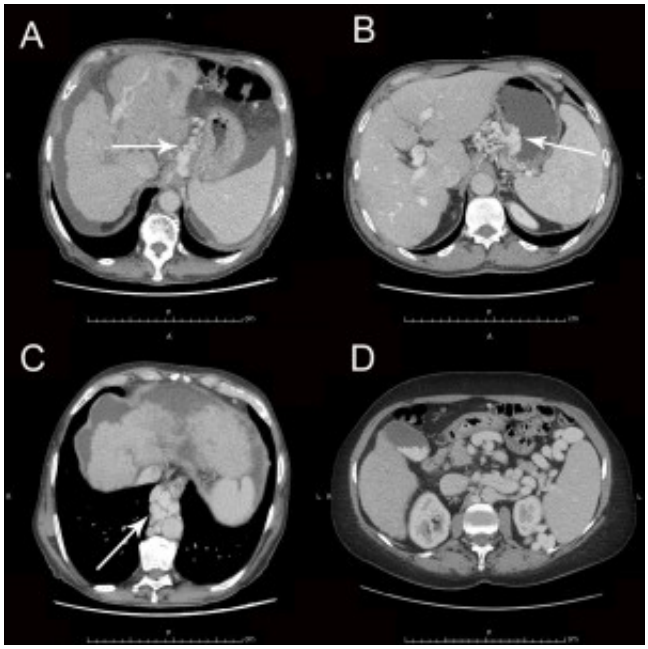

Fig.2. CT axial images in liver cirrhosis. A) The left gastric vein is enlarged, with multiple collaterals (arrow); thrombosis of the left branch of the portal vein; a hepatocellular carcinoma in the left lobe. B) A dilated left gastric vein with multiple collaterals is connected with gastric fundic varices (arrow).C) Big esophageal and peri-esophageal varices in the lower posterior mediastinum, liver atrophy with ascites.
D) Portal hypertension secondary with splenomegaly, multiple perisplenic collaterals and cholelithiasis.

Thirdly, CT permits a complete study of the entire porto-mesenteric trunk, easily detecting thrombosis, infiltration or compression from adjacent diseased organs, as lymph nodes, pancreas, etc. Among the different possible features of this pathology, we remember a concomitant splenic vein thrombosis, which can complicate the clinical conditions, favouring a quickly progressive worsening of gastro-esophageal varices and of splenomegaly. At the same time, in case of surgical procedure, surgeon is alerted from interrupting venous spleno-renal connections that represent a valid collateral network.

All these possible clinical pictures underline the value of a careful study of the entire portal system in case of liver cirrhosis, that can accompany a complete clinic-laboratory scoring, and topographically demonstrate particular hemodynamic conditions, possibly complicating surgical dissection, or becoming critical in the post-operative.

We agree that Doppler Ultrasound can integrate the study of the portal system, through the measurement of portal velocity, lowered in case of severe intra-hepatic resistances, and relief of an inverted portal venous flow.

Magnetic Resonance appears as a promising imaging tool, and new interesting contributions are today referred: its value will be largely appreciated in the next future.

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