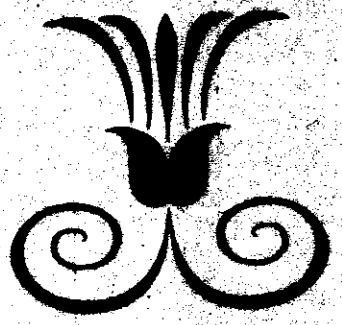

RESULTS

RESULTS

In this study 50 patients were examined 17 females, 33 males. The males ages were between 25-72Y (mean 56Y). The females ages were between 21-76Y (mean 29Y.). **The different pathological conditions are presented in {Table 1}.**

• Hepatic cirrhosis post virus hepatitis or alcohol addiction.	6 cases
• Hepatic masses including metastasis, hepatocellular carcinoma & cholangiocarcinoma.	22 cases
• Acute and chronic pancreatitis.	6 cases
• Post endoscopic cholecystectomy complications.	2 cases
• Primary biliary cirrhosis.	2 cases
• Pancreatic tumour.	4 cases
• Hepatic hydated disease.	1 case
• Transplanted liver in follow up.	4 cases
• Budd-Chiari corrected by shunt in follow up.	3 cases

The portal system anatomic abnormalities are illustrated in Table (2).

	+Ve CD + Ve Angio.	- Ve CD + Ve Angio.	+ Ve CD - Ve Angio.
Portal vein triforcation	2	0	0
Arterioportal fistula	2 (4%) Tumoral arteroportal fistula	1 (2%) Low SMA arteroportal fistula (due to cirrhosis)	0

Table (2), showed that celiomesenteric arterioportography could detect 5 cases with portal anatomic abnormalities, however CD could detect 4 cases. CD could not detect a low SMA arterioportal fistula, as this fistula was deeply abdominal, in an area rich of gases.

RESULTS

CD examination was done for 50 cases, the results of the various portal system vessels examination are presented in {Table 3}.

	+ve CD +ve Angio.	+ve CD -ve Angio.	-ve CD +ve Angio.	+ ve CD only (angio is not performed	+ ve Angio CD is not performed
Patent PV	26 (52%)	0	0	1(2%) case No. 46 (uncomplicated hepatic transplantation)	1 (2%) case No. 43 difficult CD
PV thrombosis	4 (8%) cases No. 11, 22, 42, 48	0	*2 (3%) cases (due to faint opacification) No. 17, 34	1 (2%) case 45 with patent shunt seen by CD	0
P.V branch thrombosis	7 (14%) cases No. 3, 6, 15, 19, 22, 33, 21	1 (2%) case (due to distal thrombosis in the main PV) No. 48	*4 (8%) cases No. 2, 7, 28, (due to faint opacification). No. 30 (due to mass compression).	0	0
Splenic vein thrombosis	2 (4%) cases No. 22, 48	0	0	0	0
SMV thrombosis	2 (4%) cases No. 22, 48	0	0	0	0

CD examination could not examine perfectly the portal venous system in **1** cases **(2%)**. Table (3), illustrates that in **6** cases **(12%)** PV or its branches diagnosed by CD examination as patent vessels, however in *angiography the portal vein or its branches were non opacified suspecting their thrombosis. The celiomesenteric arterioportography was misleaded by, the vessels compression by adjacent masses, by the dilution of contrast that occurs in patients with portal hypertension, or by the presence of near PV thrombosis.

The direction of blood in the different portal system vessels are presented in {Table 4}.

	Hepatopet			Hepatofuge		
	+ ve CD + ve Angio.	- ve CD + ve Angio.	+ ve CD - ve Angio.	+ ve CD + ve Angio.	- ve CD + ve Angio.	+ ve CD - ve Angio.
Portal vein	48 (98%)	0	0	1(2%) case No. 44	0	0
Portal vein branches	43 (86%)	0	0	▪3 (6%) cases No. 24, 25, 38	0	*3 (6%) cases No. 8, 15, 33
Splenic V	48 (96%)		0	2 (4%) cases No. 7, 39	0	0
IMV	2 (4%) cases No. 11, 39	0	0	0	0	0
SMV	49 (98%)	0	0	0	0	0

Table (4), illustrates that in **48** patients studied by there were hepatopet flow in the main portal vein, and in **one** patient, there was hepatofugal flow (due to shunt stent stenosis). In **43 (86%)** patients, there were hepatopet blood flow in the portal vein branch. however in **3** cases, ▪hepatofugal blood flow was detected in one of the portal vein branch (in 2 cases with tumoral arterioportal fistula (No. 24, 38) and unexplained in one case (No. 25), confirmed by both techniques. There were another 3 cases, No. 8, 15, 33 with hepatopet flow in the main portal vein and in one portal vein main branch, however the other branch had hepatofugal flow. *Angiography illustrated symmetrical hepatopete flow in the portal system. The injection of contrast media during angiography, masked the difference of blood flow direction in portal vein branches.

The various collateral types detected by CD examination and celiomesenteric arterioportography are presented in {Table 5}.

Types of collaterals	+ ve CD + ve Angio.	- ve CD + ve Angio.	+ ve CD - ve Angio.
Dilated left gastric vein with hepatofugal flow.	5 (10%), cases. No. 16, 23, 34, 37, 39	1 (2%) difficult CD examination due to ascites case 32	⊙2 (4%) cases PV was faintly opacifiled No. 17, 26
Patent paraumbilical vein.	0	0	⊙1 (2%) case. No. 9
Dilated para-oesophageal veins.	1 (2%) case. No. 34	0	0
Retropancreatic collaterals.	2 (4%) cases was incorrectly diagnosed as dilated left gastric vein. No. 15, 22	0	0
Splenorenal collaterals.	2 (4%) case. No. 38, 39	0	⊙3 (6%) cases. No. 18, 26, 39
Idiopathic porto-systemic shunt.	0	2 (4%) cases *Portocave through uterine plexus No. 12. *Low SMA arterioportal fistula No. 38. (Arterioportal fistula between SMA and Rt. PV)	0
Porto-portal collaterals.	1 (2%) case. No. 11	0	0

Table (5) illustrates **20 (40%)** pathological portal collaterals either diagnosed by both the CD and celiomesenteric arterioportography or by each of them. CD examination could detect porto-systemic collaterals in **17 (85%)** cases However celiomesenteric arterioportography had detected collaterals in **14 (70%)** cases. Also CD examination could specify the type of collateral presenting in **15 (88.2%)** cases and failed in ***2 (11.8%)** cases however celiomesenteric arterioportiography could specify the type of collateral presenting in the **14 (100%)** cases, So it's clear that CD examination is more sensitive than celiomesenteric arterioportography in detecting portal collaterals, on the other hand, it has a less specificity in processing the type of collateral present. The contrast media dilution especially in cases with portal hypertension, leads to failure of opacification of the portal system collaterals in ⊙6 **(31.6%)** cases.

Hepatic arterialization:

It was diagnosed by CD in the presence of enlarged tortuous peripheral arteries similar to the well-known angiographic finding in cirrhosis, cork screw arteries. Arterialization was also diagnosed by CD when hepatic arteries were conspicuously larger in diameter and had higher frequency shifts compared with normal hepatic arteries. This was found in 6 cases (12%), diagnosed all by CD, however angiography could diagnose 4 cases, as the visualization of there vessels are technique dependent. The amount of contrast media injected and the time of imaging are the most important factors for that.

Inferior mesenteric vein:

CD examination for the inferior mesenteric vein (1MV) was done to study the detectability of CD examination for the 1MV, the feasibility of its Doppler study and the change in the direction of blood flow in cases with portal hypertension. CD examination looked for the inferior mesenteric vein in 38 cases as the rest of the patients either they had got tired and could not complete examination or the presence of abdominal gases or ascites harden the examination. The color Doppler could detect 1MV in 26 cases (68%) and could not be detected in 12 cases (32%). Also Doppler study could done in 24 cases (92%), and could not done in 2 cases (8%), as the Doppler angle could not properly adjusted. The normal celiomesenteric angiography with selective catherterization of the CT and SMA, can not demonstrate the normal 1MV in the venous phase.

Celiomesenteric arterioportography was done in 48 cases. In the rest 2 cases, one case had get hepatic transplantation, and the CD examination had confirmed vascular integraty, and there was no indication for angiography. The other case had a shunt and CD examination had confirmed its good function, so there was no need for angiography.

The different types of celiac trunk anatomic variants presented in 48 cases which studied by both CD and celiomesenteric arteriography, are presented in {Table 6}.

Type of variant	+ ve CD + ve Angio.	- ve CD + ve Angio.	+ ve CD - ve Angio.
Near origin of the CT & SMA (Case No. 22)	0	1	0
Common celiomesenteric trunk (Case No. 33)	0	1	0
Agenesis of the CT and separate origin of the hepatic artery and of the splenic artery from the aorta (Case No. 35)	0	1	0

3 cases **(6%)** with different celiac trunk anatomic variants were found. They detected by celiomesenteric arterioportography and missed by CD. Too much gases were always present in the epigastric area and the epigastric masses however pancreatic or hepatic, harden the CD technique.

Hepatic artery, different anatomic variant that are found, are presented in {Table 7}.

These results are obtaied in the 48 cases examined by CD and angiography.

Variant	+ve CD + ve Angio.	- ve CD + ve Angio.	+ ve CD - ve Angio.	Total number
Replaced left hepatic artery from left gastric artery.	1 (2%) case No. 40	3(6%) cases No.33, 37, 41	0	4 (8%) cases
Accessory left hepatic artery from left gastric artery.	0	1(2%) case No. 1	0	1 (2%) case
Replaced right hepatic artery from the SMA	3 (8%) cases No. 30, 31, 42, 47	1(2%) case No. 3	0	4 (8%) cases
Accessory right hepatic artery from the SMA.	1 (2%) case No. 35	0	0	1 (2%) case
Replaced right hepatic artery for all liver	1 (2%) case No. 31			1 (2%) case
The main hepatic artery from the aorta	0	1(2%) case No. 35	0	1 (2%) case

Table (7), illustrates that hepatic artery variants occurred in **12** cases **(25%)**, celiomesenteric arterioportography could detect all the hepatic artery variants in the **12** cases **(100%)**, however CD examination could detect 6 cases **(50%)**.

Table (8) Presents cases studded by CD and celiomesenteric arterioportography to precise liver arterial supply. Cases of post hepatic transplantation is excluded and aniography were not done in 2 cases.

Cases studied	44
Cases precised by both techniques	31 (70.5%)
Cases precised by angio. and failed by CD	12 (27.5%)
Cases failed by angio.	0
Cases precised by CD	0
Cases failed by both techniques	1 (2.3%)

Table (8) illustrates the high sensitivity of angiography **(97.7%)** in detecting hepatic arterial supply in compare with **CD** sensitivity **(70.5%).**

Table (9) presents the different arterial pathology found in the splanchnic arteries, studded in 48 cases including cases of post hepatic transplantation.

	+ ve CD + ve Angio	+ ve CD - ve Angio	- ve CD + ve Angio
Patent CT	40 (83%) cases	-	-
Stenosed CT	*4 (8%) cases	1 (2%) case CT & hepatic artery were displaced by mass. No 21	*3 (6%)■ cases
Patent HA	44 (92%) cases		0
Stenosed HA	*3 (6%) cases	0	0
Splenic aneurysm	0	0	1 (2%) case

Table (9), illustrates that celiomesenteric arterioportography could detect *10 cases of splanchnic arteries stenosis, however CD could detect 7 (70%) of them and faild to diagnose ■3 (30%) of them. CD had a false positive result of celiac trunk and hepatic artery mild stenosis, due to large hepatic left lobe mass compression, but angiography found that, this stenosis was not a functional stenosis. As in angiography, cathetarization occurs to these arteries and contrast media is injected directly into these arteries on the other hand, the error of CD angle correction harden the diagnosis of stenosis in this area.

Inferior mesenteric artery:

The inferior mesenteric artery (IMA) was searched for by CD in 38 cases to show the detectability of CD to this artery and the easability of doing Doppler study. The IMA could detected in 30 cases 79% only and the Doppler study could done in 26 cases only 68%. The difficulty in the examination of the IMA was due to inability to obtain the correct Doppler angle, also the abdominal gases harden the technique. Selective catheterization of the IMA was not done during the celiomesenteric arterioprotography performed in this work.

Subhepatic veins and inferior vena cava:

CD examination of the subhepatic veins and inferior vena cava was done in 50 cases. 2 cases (4%) show a variant middle subhepatic vein taking origin from the left subhepatic vein. Also CD examination identified subhepatic veins attenuation by the hepatic mass lesion in 5 cases (10%). No capsular derivations could be detected. Venography was performed for the case of Budd-Chiari with complicated shunt only.

Post hepatic transplantation:

In the 4 cases with post hepatic transplantation, the results of CD examination and celiomesenteric arterioportography were as follow, {Table 10}.

	+ ve CD + ve Angio	+ ve CD - ve Angio	- ve CD + ve Angio	CD only
Patency of the PV & its branches	2	0	0	1
Thrombosis of the PV or its branches	1	0	0	1
Stenosed HA or its branches	2	0	0	0
Patency of the HA	1	0	0	1

Aniography had no need in cases of post-hepatic transplantation, if the biological conditions and **CD** results had confirmed the vascular integrity.

Interventional shunt:

In the **2** cases with surgical porto-systemic shunt, the **CD** examination could confirm shunt good function, and angiography had no need to confirm this result. However in the TIPS case, **CD** examination firstly and angiography (celiomesenteric arterioportography and inferior vena cavography) secondly could diagnose stent obstruction.
From cases of vascular intervention however surgical, as in cases with hepatic transplantation or surgical shunt, or angiographic intervention as TIPS, we can recognize that CD examination is an efficient technique to follow up the vascular patency, the occurrence of thrombosis, shunt function.

Venous System

No	Age	Sex	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Splenic Vein Permeability	Splenic Vein Direction of Flow	SMV Permeability	SMV Direction of Flow	IMV Permeability	IMV Direction of Flow	Derviations	Comment
1-	41Y	♂	• Rt. Hepatic multinodules • Cancer ampulla of Vater	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	– Ve – Ve	
2-	48Y	♂	• Cirrhotic liver post hepatitis B	CD Angio	– Ve – Ve	+ Ve ?? Lt. portal vein thrombosis	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	– Ve – Ve	
3-	44Y	♂	• Mass in the Rt. lobe of the liver • Retroperitoneal lymphadenopathy	CD Angio	– Ve – Ve	Rt. PV. Thrombosis Rt. PV. Thrombosis	Hepatopet in main PV,Lt.PV Hepatopet in main PV,Lt.PV	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	Cannot be seen non - examined	Cannot be seen non - examined	– Ve – Ve	
4-	50Y	♂	Ch. pancreatitis	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	– Ve – Ve	
5-	62Y	♂	Hepatic Cirrhosis Nodule in Segment VII	CD Angio	Trifurcation Trifurcation	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	non - examined + Ve	non - examined Hepatopet	non - examined non - examined	non - examined non - examined	– Ve – Ve	Difficult examinat due to gas.
6-	30Y	♂	Rt lobe hepatic tumour	CD Angio	– Ve – Ve	Partially thrombosed Rt. PV + patent main PV, Lt. PV Complete thrombosis of the Rt. PV patent main PV, Lt. PV	Hepatopet Hepatopet	– Ve – Ve	+ Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	– Ve – Ve	
7-	21Y	♀	Large hepatic mass, segment V VI VIII	CD Angio	– Ve – Ve	Rt. + Lt. PV compressed by the mass ? Rt. PV Thrombosis	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatofuge Hepatofuge	+ Ve + Ve	Hepatopet Hepatopet	Cannot be seen non - examined	Cannot be seen non - examined	– Ve – Ve	
8-	63Y	♂	- Hepatic cirrhosis post hepatitis C. - Multiple nodules segment VII VI.	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Rt. PV and main PV Hepatofuge Lt. PV Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	– Ve – Ve	
9-	56Y	♂	- Alcoholic hepatic cirrhosis	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	Cannot be seen non - examined	Cannot be seen non - examined	Dilated paraumbilical vein with hepatofugal flow – Ve	
10-	55Y	♀	Hepatic nodule segment VI	CD Angio	– Ve – Ve	Rt. PV compressed by nodule Rt. PV compressed by nodule	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	Cannot be seen non - examined	Cannot be seen non - examined	– Ve – Ve	
11-	44Y	♂	Rt. lobe multinodular H.C.C	CD Angio	– Ve – Ve	Thrombosed PV Partially thrombosed portal confluence The Same Result	Hepatopet non - opacified	+ Ve + Ve	+ Ve	+ Ve + Ve	Hepatofuge Hepatofuge	+ Ve + Ve	Hepatofuge Hepatofuge	+ Ve + Ve	Hepatofuge Hepatofuge	Portoportal Portoportal	
12-	45Y	♀	Alcoholic cirrhosis + Nodule segment V	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	+ Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	Cannot be seen non - examined	Cannot be seen non - examined	– ne portocave through uterine plexus	Difficult exami due to ga
13-	43Y	♂	Ch. pancreatitis	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	– Ve – Ve	
14-	64Y	♂	Lt. hepatic HCC nodule segment II in top of hepatic cirrhosis post hepatitis B.	CD Angio	– Ve – Ve	+ Ve + Ve	Hepatopet Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	non - examined non - examined	non - examined non - examined	– Ve – Ve	
15-	72Y	♂	Rt. lobe HCC	CD Angio	– Ve – Ve	Thrombosed Rt. PV Thrombosed Rt. PV	Hepatopet main PV + Lt. PV, hepatofuge proximal Rt. PV Hepatopet	– Ve – Ve	– Ve	+ Ve + Ve	Hepatopet Hepatopet	+ Ve + Ve	Hepatopet Hepatopet	+ Ve non - examined	Hepatopet non - examined	Lt. gastric V with hepatofuge blood flow. Derivation retropancreatic to the Lt. renal V.	
16-	44Y	♂	- Hepatic cirrhosis due to . . .	CD	– Ve	+ Ve	Hepatopet	– Ve	+ Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	Lt. gastric V with hepatofuge blood flow.	Easy exam

										Splenoportal		SMV		IMV				
										Permeability	Direction of flow	Permeability	Direction of flow	Permeability	Direction of flow	Derivations	Comment
17-	55Y	♀	• Hepatic cirrhosis post hepatitis C,D • Ascites - Haemoptosis	CD		+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	• Patent Lt. gastric V with hepatofugal Flow.	Easily performed.
				Anglo		Opacified Faintly	Hepatopet			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	Cannot be seen.	The PV. is faintly opacif
18-	57Y	♂	• Liver cirrhosis due to Ch. hepatitis. • Encephalopathy and ascites	CD	Triforcation	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	• Patent splenorenal derivations	Difficult examinati due to ascites and
				Anglo	Triforcation	+ Ve	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
19-	72Y	♂	• Hepatic cirrhosis post hepatitis C • Rt. hepatic multifocal HCC	CD	– Ve	Rt. post PV. Thrombosis	Rt. PV, Lt. PV main PV Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	Easy examinati
			segment VII VIII	Anglo	– Ve	Rt. post PV. Thrombosis	Rt. PV, Lt. PV main PV Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	Hepatopet	Hepatopet	– Ve	
20-	64Y	♂	Hepatitis C, hemoptesis ascites, encophalopathy prepared for TIPS before hepatic transplantation (HT)	CD	– Ve	T Ve	[illegible]	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	Cannot be seen	Cannot be seen	– Ve	Difficult examinat due to ascites
				Anglo	– Ve	+ Ve	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
21-	25Y	♂	• Hepatic cirrhosis after hepatitis C. • Nodule of segment IV Planing before HT.	CD	– Ve	Rt. PV. surrounds the nodule	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	? Dilated gastric collaterals.	
				Anglo	– Ve	Rt. PV. surrounds the nodule	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined		
22-	58Y	♂	Acute Pancreatitis	CD	– Ve	- Partially thrombosed confulance, + Lt. PV.	Hepatopet	+ Ve	+ Ve	Partially thrombosed termination	Hepatopet	Partially thrombosed termination	Hepatopet	+ Ve	Hepatopet	Dilated retropancreatic collaterals that terminal in the Lt. renal V.	
				Anglo	– Ve	- Partially thrombosed confulance, + Lt. PV.	Hepatopet	+ Ve		Partially thrombosed termination	Hepatopet	Partially thrombosed termination	Hepatopet	non - examined	non - examined	Dilated Lt. gastric V.	Difficult exam due to obe
23-	71Y	♂	HCC of the hepatic dome	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	Cannot be seen	Cannot be seen	Dilated Lt. gastric V.	
				Anglo	– Ve	+ Ve	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
24-	68Y	♂	HCC nodule segment VIII in a cirrhotic liver.	CD	Distal arterio portal fistula	+ Ve	Hepatopet + Hepatofuge in Rt. PV	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Anglo	The Same	+ Ve	The Same	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
25-	64Y	♀	Multiple hepatic nodules	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	• Patent Lt. gastric V. with hepatofuge flow. • Patent splenorenal collateral	Difficult ex to asc
				Anglo	– Ve	+ Ve	Rt. PV and main PV hepatofuge Lt. PV. Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
26-	51Y	♀	Hepatic cirrhosis post hepatitis c, alcohol adeqution	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Anglo	– Ve	+ Ve	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
27-	61Y	♂	Stenosis of the distal CBD post endoscopic cholecystectomy	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	Cannot be seen	Cannot be seen	– Ve	
				Anglo	– Ve	+ Ve	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
28-	65Y	♂	Pancreatic head tumour planing for pancreatecoduodenctomy	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	Cannot examin	Cannot examin	– Ve	
				Anglo	– Ve	Faint opacification of Lt. PV branches.	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
29-	48Y	♀	Stenosed biliary convergence post endoscopic cholecystectomy	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Anglo	– Ve	+ Ve	Hepatopet	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet				
			Hepatic cirrhosis and focal nodule	CD	– Ve	+Ve											

											Splenic Vein		SMV		IMV		Deviations	Comment
											Permeability	Direction of Flow	Permeability	Direction of Flow	Permeability	Direction of Flow		
31-	69Y	♂	Multifocal HCC in top of hepatic cirrhosis.	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Cannot examin	– Ve	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
32-	41Y	♀	Primary biliary cirrhosis planing before HT	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	Cannot be seen	Cannot be seen	– ne dilated Lt. gastic V With hepatofuge Flow	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined		
33-	70Y	♀	Cholangocarcinoma of the Lt. lobe.	CD	– Ve	Thrombosed Lt. PV Permeable Rt. PV. main PV	Hepatopet main PV, Rt. PV + hepatofuge Lt. PV	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Cannot examin	– Ve	
				Angio	– Ve	The Same	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
34-	31Y	♀	Hepatic cirrhosis post hepatitis C, ascites. Planing before HT.	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve dilated	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	-Patent Lt. gastric V. with hepatofuge flow. -Large para oesophogeal cardiac collaters Ls. + Dilated gastric V.	Difficult exam d to gas and asci
				Angio	Faintly Opacified	Faintly Opacified	Hepatopet				+ Ve dilated	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined		
35-	40Y	♀	HCC segment *VII , VIII*	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
36-	61Y	♂	Focal pancreatic lesion with dilatation of intrahepatic biliary radicals.	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	Patent Lt. gastric vein with hepatofuge flow. The Same	Difficult ex
37-	49Y	♂	Alcoholic ch. pancreatitis	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		– Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	-Patent splenorenal collaterals.	
				Angio	– Ve	?? Lt. PV thrombosis	Hepatopet	– Ve			– Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	-Patent splenorenal collaterals.	
38-	67Y	♀	Rt. lobe tumour	CD	Tumoral arteriaportal fistula with Rt. hepatic artery	+ Ve	Hepatofuge in Rt. PV Hepatopet in the main PV and Lt. PV.	– Ve	– Ve		+ Ve	Hepatofuge	+ Ve	Hepatopet	+ Ve	Hepatofuge	-Patent splenorenal collaterals. Dilated Lt. gastric V.	
				Angio	Tumoral arteriaportal fistula with Rt. hepatic artery	+ Ve	Hepatofuge in Rt. PV Hepatopet in the main PV and Lt. PV.	– Ve			– Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	-Patent splenorenal collaterals. Dilated Lt. gastric V.	
39-	45Y	♀	Primary biliary cirrhosis.	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatofuge	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatofuge	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
40-	64Y	♀	Ch. hepatitis, pancreatic tumour ? sarcoma - planing before pancreatico duodenectomy.	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
41-	54Y	♂	Ch. pancreatitis.	CD	– Ve	+ Ve	Hepatopet	– Ve	– Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	+ Ve	Hepatopet	– Ve	
				Angio	– Ve	+ Ve	Hepatopet	– Ve			+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	– Ve	
42-	50Y	♂	Ch. pancreatitis with false cyst juxtaduodenal.	CD	– Ve	Partially thromboses Portal confulance	Hepatopet	+ Ve	– Ve		+ Ve	Hepatopet	Partially Thrombosed termination	Hepatopet	Can not examin	Can not examin	– Ve	Difficult to Pt.
				Angio	– Ve	Partially thromboses Portal	Hepatopet	+ Ve			+ Ve	Hepatopet	Partially Thrombosed termination	Hepatopet			– Ve	

										Splenic Vein		SMV		IMV		Derivations	Comment
										Permeability	Direction of Flow	Permeability	Direction of Flow	Permeability	Direction of Flow		
43-	52Y	♂	Lt. lobe cystic lesion, hyperechogenic and partially calcified in US. ?? Hydatid cyst. pre- operative planing.	CD Angio	− Ve	*Patent superiorly imprented Lt. PV. *Patent main PV and Rt. PV	Hepatopet	− Ve	− Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined	− Ve	Very difficult due … sever gas and obe…
44-	40Y	♀	TIPS since 6 mouth in case of Budd-Chiari follow up.	CD	The stent passed between middle SHV with PV	Stenosed stent + patent PV.	Hepatofuge	− Ve	+ Ve	+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined		
				Angio		proved stenosed and replaced		− Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined		
45-	43Y	♀	Budd - Chiari with portocaval shunt correction since 2 years	CD Angio		-Patent non stenotic porto-caval shunt + minimal residue of PV partial thrombosis	Hepatopet	− Ve		+ Ve	Hepatopet	+ Ve	Hepatopet	non - examined	non - examined		No need.
46-	40Y	♂	Hepatic transplantation since 6 month.	CD Angio		+ Ve	Hepatopet	− Ve	− Ve	+ Ve	Hepatopet	+ Ve	Hepatopet				No need.
47-	30Y	♂	Budd - Chiari since 1 year with history of mesocaval surgical shunt since 6 mohthes ⟶ obstructed and recent porto caval shunt since a weak ⟶ bad pt. general condition.	CD		-Patent shunt. -Thrombosed Rt. PV.	Hepatopet In the Lt PV. + In. the main PV	− Ve		+ Ve	Hepatopet	+ Ve	Hepatopet				
48-	50Y	♂	Follow up after 6 month hepatic transplantation.	CD		*Partially thrombosed portal confulance and main PV distal and proximol to the site of stenosis, *?? Rt. PV thrombosis no flow by CD but without detection of thrombosis.	Hepatopet	− Ve	− Ve	Thrombosed termination.	Hepatopet	Thrombosed termination.	Hepatopet				
				Angio		*Partially thrombosed portal confulance and main PV.	Hepatopet	− Ve		Thrombosed termination.	Hepatopet	Thrombosed termination.	Hepatopet				
49-	59Y	♀	Follow up after 1 month hepatic transplantation.	CD		+ Ve	Hepatopet	− Ve	− Ve	+ Ve	Hepatopet	+ Ve	Hepatopet				
				Augio		+ Ve	Hepatopet	− Ve		+ Ve	Hepatopet	+ Ve	Hepatopet				
50-	52Y	♂	Hepatic transplantation since 2 months and now presented by disturbed liver function .	CD		+ Ve	Hepatopet	− Ve	− Ve	+ Ve	Hepatopet	+ Ve	Hepatopet				
				Augio		+ Ve	Hepatopet	− Ve		+ Ve	Hepatopet	+ Ve	Hepatopet				

Arterial System

No	Age	Sex	Clinical Picture	CT.			HA		SMA		IMA		Technique	Comment
				Anatomic variant	Compression by the diaph.	stenosis	origin	stenosis	Anatomic variant	stenosis	Detectability	stenosis		
1-	41Y	♂	• Rt. Hepatic multiplenodules • Cancer ampulla of Vater	– ne – ne	– ne – ne	?? Stenosis + Vs mild	From CT • Rt. propre hepatic artery from CT. • Lt. hepatic artery to segment III.	– ne – ne	– ne – ne	– ne – ne	Detectable non - examined	– ne non - examined	CD Angio	
2-	48Y	♂	• Cirrhotic liver post hepatitis B • Rt. lobectomy due to HCC	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	Detectable non - examined	– ne non - examined	CD Angio	easy examination
3-	44Y	♂	• Mass in the Rt. lobe of the liver • Retropretonial lymphadenopathy	– ne – ne	– ne – ne	– ne – ne	- CT gives HA - Rt. HA for Rt. lobe - Common HA from CT.	– ne – ne	– ne gives Rt. HA	– ne – ne	Cannot be seen non - examined	Cannot be seen non - examined	CD Angio	
4-	50Y	♂	Ch. pancreatitis	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	detectable non - examined	– ne non - examined	CD Angio	
5-	62Y	♂	Hepatic Cirrhosis Nodule in Segment *VII*	– ne	– ne	– ne	From CT	– ne	– ne	– ne	non - examined	non - examined	CD Angio	Cannot examined due to gas
6-	30Y	♂	Rt lobe hepatic tumour	– ne – ne	– ne – ne	– ne – ne	CT From CT	– ne – ne	– ne – ne	– ne – ne	detectable non - examined	– ne non - examined	CD Angio	
7-	21Y	♀	Large hepatic mass, segment *V VI VIII*	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	detectable non - examined	– ne non - examined	CD Angio	
8-	63Y	♂	- Hepatic cirrhosis post hepatitis C. - Multiple nodules segment *VII VI.*	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	difficultly seen non - examined	– ne non - examined	CD Angio	
9-	56Y	♂	- Alcoholic hepatic cirrhosis	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	Cannot be seen non - examined	Cannot be seen non - examined	CD Angio	
10-	55Y	♀	Hepatic nodule segment *VI*	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	Cannot be seen non - examined	Cannot be seen non - examined	CD Angio	
11-	44Y	♂	Rt. lobe multinodular H.C.C	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	– ne – ne	– ne – ne	easily seen non - examined	– ne non - examined	CD Angio	
12-	45Y	♀	Alcoholic cirrhosis + Nodule segment *V*	– ne – ne	– ne – ne	– ne – ne	From CT From CT	– ne – ne	Cannot be seen – ne	Cannot be seen – ne	Cannt be seen non - examined	Cannt be seen non - examined	CD Angio	Difficult examination due to gas
13-	43Y	♂	Ch. pancreatitis	– ne	– ne	– ne	From CT	– ne	– ne	– ne				

												SMA		IMA		Comment
												Anatomic variant	stenosis	Detectability	stenosis	
14-	64Y	♂	Lt. hepatic HCC nodule segment II in top of hepatic cirrhosis post hepatitis B.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	non - examined non - examined	non - examined non - examined	Cannot complet the examination due to patient tirdness .
15-	72Y	♂	Rt. lobe HCC	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	detectable non - examined	– Ve non - examined	
16-	44Y	♂	- Hepatic cirrhosis due to cholangiosclerosis grade 1. - Rt. lobe HCC nodule.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	detectable non - examined	– Ve non - examined	
17-	55Y	♀	• Hepatic cirrhosis post hepatitis C,D • Ascites - Haemoptesis	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	easily seen non - examined	– Ve non - examined	
18-	57Y	♂	• Liver cirrhosis due to Ch. hepatitis. • Encephalopathy and ascities	CD Angio	Cannot be seen – Ve	Cannot be seen – Ve	Cannot be seen – Ve	?? From CT From CT	– Ve – Ve	Cannot be seen – Ve	Cannot be seen – Ve	Cannot be seen non - examined	Cannot be seen non - examined	Difficult examination due to gas
19-	72Y	♂	• Hepatic cirrhosis post hepatitis C • Rt. hepatic multifocal HCC segment VII VIII	CD	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	easily seen non - examined	– Ve non - examined	Easy examination
20-	64Y	♂	Hepatitis C, hemoptesis ascites, encephalopathy prepared for TIPS before hepatic transplantation (HT)	CD Angio	Cannot be seen – Ve	Cannot be seen – Ve	Cannot be seen – Ve	?? From CT From CT	– Ve – Ve	Cannot be seen – Ve	Cannot be seen – Ve	Cannot be seen non - examined	Cannot be seen non - examined	Difficult examination due to ascit
21-	25Y	♂	• Hepatic cirhosis after hepatitis C. • Nodule of segment IV Planing before HT.	CD Angio	– Ve – Ve	– Ve – Ve	Compressed and desplaced by the mass ?? stenosis Compressed anteriorly and desplaced posteriorly by the mass	From CT From CT	Copressed by the mass ?? stenosis – Ve	– Ve – Ve	Copressed by the mass Compressed anteriorly and desplaced posteriorly by the mass	Cannot be seen non - examined	Cannot be seen non - examined	Difficult examination due to th distortion by the mass . Difficult examination due to th distortion by the mass .
22-	58Y	♂	Acute Pancreatitis	CD Angio	Common caelio mesenteric trunk near origin of CT and SMA – Ve	– Ve – Ve	– Ve – Ve	From common caeliomesenteric trunk From CT	– Ve – Ve	common caeliomesenteric trunk near origin of CT and SMA	– Ve – Ve	detectable non - examined	– Ve non - examined	
23-	71Y	♂	HCC of the hepatic dome	CD Angio	Cannot be seen – Ve	Cannot be seen – Ve	Cannot be seen – Ve	?? From CT From CT	– Ve – Ve	Cannot be seen – Ve	Cannot be seen – Ve	can not be seen non - examined	– Ve non - examined	Difficult examination due to ob
24-	68Y	♂	HCC nodule segment VIII in a cirrhotic liver.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	detectable non - examined	– Ve non - examined	

										SMA		IMA		Comment
											Stenosis	Detectability	Stenosis	
25-	64Y	♀	Multiple hepatic nodules	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From CT From CT	−Ve −Ve	−Ve −Ve	−Ve −Ve	detectable non - examined	−Ve non - examined	
26-	51Y	♀	Hepatic cirrhosis post hepatitis c, alcohol adeqution	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From CT From CT	−Ve −Ve	−Ve −Ve	−Ve −Ve	detectable non - examined	−Ve non - examined	
27-	61Y	♂	Stenosis of the distal CBD post endoscopic cholecystectomy	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From CT From CT	−Ve −Ve	−Ve −Ve	−Ve −Ve	detectable non - examined	−Ve non - examined	
28-	65Y	♂	Pancreatic head tumour plaining for pancreatecoduodenctomy	CD Angio	−Ve −Ve	−Ve +Ve slightly	+Ve +Ve	From CT From CT	−Ve −Ve	−Ve −Ve	−Ve −Ve	Cannot be seen non - examined	Cannot be seen non - examined	
29-	48Y	♀	Stenosed biliary convergence post endoscopic cholecystactomy	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From CT From CT	−Ve −Ve	−Ve −Ve	−Ve −Ve	detectable non - examined	−Ve non - examined	
30-	69Y	♂	Hepatic cirrhosis and focal nodule segment VI ? metastasis ? hepatoma	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From CT + SMA From CT + SMA	−Ve −Ve	Gives Replaced Rt. HA Gives Replaced Rt. HA	−Ve −Ve	detectable non - examined	Cannot examin non - examined	
31-	69Y	♂	Multifocal HCC in top of hepatic cirrhosis.	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From SMA From SMA	−Ve −Ve	Replaced Rt. HA to all the Liver Replaced Rt. HA to all the Liver	−Ve −Ve	detectable non - examined	−Ve non - examined	
32-	41Y	♀	Primary biliary cirrhosis planing before HT	CD Angio	−Ve −Ve	−Ve −Ve	−Ve −Ve	From CT From CT	−Ve −Ve	−Ve −Ve	−Ve −Ve	Cannot be seen non - examined	Cannot be seen non - examined	
33-	70Y	♀	Cholangocarcinoma of the Lt. lobe.	CD Angio	−Ve common caelio meseuteric trunk	−Ve −Ve	−Ve −Ve	From CT From common caeliomesenteric trunk Lt. gastric A. gives abbarrent replaced Lt. HA	−Ve −Ve	−Ve common caeliomesenteric trunk	−Ve −Ve	detectable non - examined	−Ve non - examined	
34-	31Y	♀	Hepatic cirrhosis post hepatitis C, ascites. Planing before HT.	CD Angio	Cannot be seen −Ve	Cannot be seen −Ve	Cannot be seen −Ve	?? From CT From CT	−Ve −Ve	Cannot be seen −Ve	Cannot be seen −Ve	Cannot be seen non - examined	Cannot be seen non - examined	Difficult examination due to ga[s] ascites. Also, it demonstrates sple[nic] aneurysms at hilar spleni[c] artery branches.
35-	40Y	♀	HCC segment VII , VIII	CD Angio	−Ve Separate origin of the HA & SA	−Ve −Ve	−Ve −Ve	From CT From aorta	−Ve −Ve	accessory Rt. A accessory Rt. A	−Ve −Ve	detectable non - examined	−Ve non - examined	

									Celiac		SMA		IMA		Comment
									Anatomic variant	Stenosis	Detectability	Stenosis	
36-61Y	♂	Focal pancreatic lesion with dilatation of intrahepatic biliary radicals.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	detectable non - examined	– Ve non - examined	
37-49Y	♂	Alcoholic ch. pancreatitis	CD Angio	– Ve – Ve	– Ve – Ve	+ Ve – Ve	From CT - Lt. Replaced HA from Lt. gastric A. - ?? Rt. HA from SMA	+ Ve + Ve	Cannot be seen ?? Rt. HA from SMA	Cannot be seen	detectable non - examined	– Ve non - examined	Difficult Doppler examination due to distortion by pancreatitis . Difficult examination due to sever distortion by the pancreatitis .
38-67Y	♀	Rt. lobe tumour	CD Angio	– Ve – Ve	– Ve + Ve with reversed flow in gastroduodenal artery	– Ve + Ve with reversed flow in gastroduodenal artery	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	easily non - examined	– Ve non - examined	Difficult examination due to mass compression .
39-45Y	♀	Primary biliary cirrhosis.	CD Angio	– Ve – Ve	– Ve + Ve	– Ve + Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	detectable non - examined	– Ve non - examined	
40-64Y	♀	Ch. hepatitis, pancreatic tumour ? sarcoma - planing before pancreatico duodenectomy.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT + Lt. gastric artery (Replaced HA) From CT + Lt. gastric artery (Replaced HA)	– Ve – Ve	– Ve – Ve	– Ve – Ve	detectable non - examined	– Ve non - examined	
41-54Y	♂	Ch. pancreatitis.	CD Angio	– Ve CT gives only the Rt. HA	– Ve – Ve	– Ve – Ve	From CT * Replaced Lt. HA from Lt. gastric A * Rt. HA from CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	easy non - examined	– Ve non - examined	Cannot complete the exam du patient illness
42-50Y	♂	Ch. pancreatitis with false cyst juxtaduodenal.	CD Angio	It gives only the Lt. HA It gives only the Lt. HA	– Ve – Ve	– Ve – Ve	*Replaced Rt. HA from SMA. *CT gives only the Lt. HA *Replaced Rt. HA from SMA. *CT gives only the Lt. HA	– Ve – Ve	It gives the replaced Rt. HA. It gives the replaced Rt. HA.	– Ve – Ve	Detectable non - examined	Cannot examin non - examined	
43-52Y	♂	Lt. lobe cystic lesion, hyperechogenic and partially calcified in US. ?? Hydatid cyst. pre- operative planing.	CD Angio	– Ve – Ve	– Ve – Ve	+ Ve + Reversal	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	non - examined non - examined	non - examined non - examined	Can not well do due to sever The Rt. and Lt. HA, give small a

											SMA		IMA		Comment
											Detectability	Stenosis	Detectability	Stenosis	
44-	40Y	♀	TIPS since 6 mouth in case of Budd-Chiari follow up.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve – Ve	From CT From CT	– Ve – Ve	– Ve – Ve	– Ve – Ve	non - examined non - examined	non - examined non - examined		
45-	43Y	♀	Budd - Chiari with portocaval shunt correction since 2 years	CD Angio	– Ve	– Ve	– Ve	From CT	– Ve	– Ve	– Ve	non - examined	non - examined		No need for it.
46-	40Y	♂	Hepatic transplantation since 6 month.	CD Angio	– Ve		– Ve		– Ve						No need for it.
47-	30Y	♂	Budd - Chiari since 1 year with history of mesocaval surgical shunt since 6 mohthes ⟶ obstructed and recent porto caval shunt since a weak ⟶ bad pt. general condition.	CD Angio	– Ve – Ve	– Ve – Ve	– Ve + Ve Mild	From SMA From SMA	– Ve – Ve	gives replaced Rt. HA gives replaced Rt. HA	– Ve – Ve				
48-	50Y	♂	Follow up after 6 month hepatic transplantation.	CD Angio		– Ve – Ve	– Ve – Ve		– Ve – Ve						
49-	59Y	♀	Follow up after 1 month hepatic transplantation.	CD Angio		– Ve – Ve	– Ve – Ve		Stenosed Lt. HA Stenosed Lt. HA		– Ve – Ve	non - examined non - examined	non - examined non - examined		
50-	52Y	♂	Hepatic transplantation in 4/94 and developed hepatic A- stenosis in 6/94.	CD Angio		– Ve – Ve	– Ve – Ve		Stenosed proper HA + non visualization of HA. branches Stenosed proper HA + non visualization of HA. branches						

Inferior Vena Cava & Sub Hepatic Veins

No	Age	Sex	Clinical Picture	Technique	Tumor thrombus	Attenuation or occlusion	Capsular deviation	Comment
1-	41Y	♂	• Rt. hepatic multiple nodules. • Cancer ampulla of vater.	CD Angio	– Ve non - examined	– Ve non - examined	– Ve non - examined	
2-	48Y	♂	• Cirrhotic liver post hepatitis B. • Rt. lobectomy due to HCC.	CD Angio	– Ve non - examined	– Ve non - examined	– Ve non - examined	
3-	44Y	♂	Mass in the Rt. Lobe of the liver + retropretonial lymphadenopathy	CD Angio	– Ve non - examined	– Ve non - examined	– Ve non - examined	
4-	50Y	♂	Ch. pancreatitis	CD Angio	The middle SHV takes origin from the left SHV non - examined	– Ve non - examined	– Ve non - examined	
5-	62Y	♂	Hepatic cirrhosis - nodule in segment VII	CD Angio	– Ve non - examined	– Ve non - examined	– Ve non - examined	Difficult examination due to gas.
6-	30Y	♂	Rt. lobe hepatic tumour	CD Angio	– Ve non - examined	The Lt. branch attenuated by the mass non - examined	– Ve non - examined	
7-	21Y	♀	Large hepatic mass segment V VI VIII	CD Angio	– Ve non - examined	The middle branch is seen withen the mass non - examined	– Ve non - examined	
8-	63Y	♂	Hepatic cirrhosis post hepatitis	CD Angio	– Ve non - examined	– Ve non - examined	– Ve non - examined	
9-	56Y	♂	Alcoholic hepatic cirrhosis	CD	– Ve	– Ve	– Ve	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Capsular derevation	Comment
10-	55Y	♀	Hepatic nodule segment VI	CD	− Ve	− Ve	− Ve	
				Angio	non - examined	non - examined	non - examined	
11-	44Y	♂	Rt. lobe multinodular HCC	CD	− Ve	− Ve	− Ve	
				Angio	non - examined	non - examined	non - examined	
12-	45Y	♀	Alcoholic cirrhosis + Nodule segment V	CD	− Ve	− Ve	− Ve	Difficult examination due to gas.
				Angio	Portocave uterogonadice shunt	− Ve	− Ve	
13-	43Y	♂	Ch pancreatitis	CD	The middle SHV takes origin from the Lt. SHV	− Ve	− Ve	Difficult examination due to gas.
				Angio	non - examined	non - examined	non - examined	
14-	64Y	♂	Lt. hepatic HCC nodule In top of hepatic cirrhosis. Post hepatitis B	CD	− Ve	The Lt. SHV surrounds the mass	− Ve	
				Angio	non - examined	non - examined	non - examined	
15-	72Y	♂	Rt. Lobe HCC.	CD	− Ve	− Ve	− Ve	
				Angio	non - examined	non - examined	non - examined	
16-	44Y	♂	• Hepatic cirrhosis due to cholong, oeclerosis grade I. • Rt. Lobe HCC nodule.	CD	− Ve	− Ve	− Ve	
				Angio	non - examined	non - examined	non - examined	
17-	55Y	♀	• Hepatic cirrhosis post hepatitis C, D. • Ascites • Haemoptsis	CD	− Ve	− Ve	− Ve	
				Angio	non - examined	non - examined	non - examined	
18-	57Y	♂	• Liver cirrhosis due to Ch. hepatitis. • Encephalopathy and ascites.	CD	− Ve	− Ve	− Ve	
				Angio	non - examined	non - examined	non - examined	
19-	72Y	♂	• Hepatic cirrhosis post hepatitis C. Rt. hepatic multifocal HCC segment VII, VIII.	CD	− Ve	The Rt. SHV is attenuatted and runs above the upper border of the mass.	− Ve	

20-	64Y	♂	* Hepatitis C, hemoptesis, ascites encephalopathy, prepared for TIPS befor hepatic transplantation .	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
21-	25Y	♂	* Hepatic cirrhosis after hepatitis C Nodule of segment IV . Planing before HT .	CD Angio	— Ve non - examined	The middle SHV is seen within the mass middly attennuated. non - examined	— Ve non - examined	
22-	58Y	♂	* Acute pancreatitis	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
23-	71Y	♂	HCC of the hepatic dome	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
24-	68Y	♂	HCC nodule segment VIII in a cirrhotic liver	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
25-	64Y	♀	Multiple hepatic nodules	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
26-	51Y	♀	Hepatic cirrhosis post hepatitis C and alcohol addiction	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
27-	61Y	♂	Stenosis of the distal CBD post endoscopic cholecystectomy	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
28-	65Y	♂	Pancreatic head tumour planning for pancreatecodeudenctomy .	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	
29-	48Y	♀	Stenosed billary convergance post endoscopic cholecystectomy	CD Angio	— Ve non - examined	— Ve non - examined	— Ve non - examined	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] or occlusion	Capsular dereviation	Comment
30-	69Y	♂	Hepatic cirrhosis and focal nodule, segment VI ? metastasis ? hepatoma	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
31-	69Y	♂	Multifocal HCC in top of hepatic cirrhosis	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
32-	41Y	♀	Primary biliary cirrhosis plaining befor HT .	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
33-	70Y	♀	Cholangiocarcinoma of Lt. Labe	CD	– Ve	The Lt. SHV surrounds the mass.	– Ve	
				Angio	non - examined	non - examined	non - examined	
34-	31Y	♀	Hepatic cirrhosis, post hepatitis C planing befor HT	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
35-	40Y	♀	HCC segment VII , VIII	CD	The Rt. SHV gives accessory branch	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
36-	61Y	♂	Focal pancreatic lesion + Dilated IHBR	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
37-	49Y	♂	Alcoholic chronic pancreatitis	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
38-	67Y	♀	Rt. lobe tumour	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
39-	45Y	♀	Primary biliary cirrhosis	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	

No	Age	Sex	[illegible]	[illegible]	[illegible]	[illegible]	Capular dereviation	Comment
40-	64Y	♀	Ch. hepatitis, pancreatic tumour ? sarcoma - planing before pancreatico duodenectomy.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
41-	54Y	♂	Ch. pancreatitis.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
42-	50Y	♂	Ch. pancreatitis with false cyst juxtaduodenal.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
43-	52Y	♂	Lt. lobe cystic lesion, hyperechogenic and partially calcified in US. ?? Hydatid cyst. pre- operative planing.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
44-	40Y	♀	TIPS since 6 mouth in case of Budd-Chiari follow up.	CD	– Ve	+ Ve Reversal of blood flow	+ Ve	
				Angio	– Ve	Stenosed portocaval stent and it is replaced by another one.	+ Ve	No need
45-	43Y	♀	Budd - Chiari with portocaval shunt correction since 2 years	CD	stent portocave between middle SHV and PV.	Patent stent	+ Ve	
				Angio				
46-	40Y	♂	Hepatic transplantation since 6 month.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
47-	30Y	♂	Budd - Chiari since 1 year with history of mesocaval surgical shunt since 6 mohthes ⟶ obstructed and recent porto caval shunt since a weak ⟶ bad pt. general condition.	CD	stent portocave	Patent portocaval stent with hepatofuge flow in SHV, - narrowed retrohepatic IVC	+ Ve	
				Angio	stent portocave	Patent portocaval stent with hepato fugeflow in SHV, - narrowed retro hepatic IVC	– Ve	
48-	50Y	♂	Follow up after 6 month hepatic transplantation.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
49-	59Y	♀	Follow up after 1 month hepatic transplantation.	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	
50-	52Y	♂	Hepatic transplantation since 2 months and now presented by disturbed liver function .	CD	– Ve	– Ve	– Ve	
				Angio	non - examined	non - examined	non - examined	