

Vascular problems and techniques in pancreatic surgery

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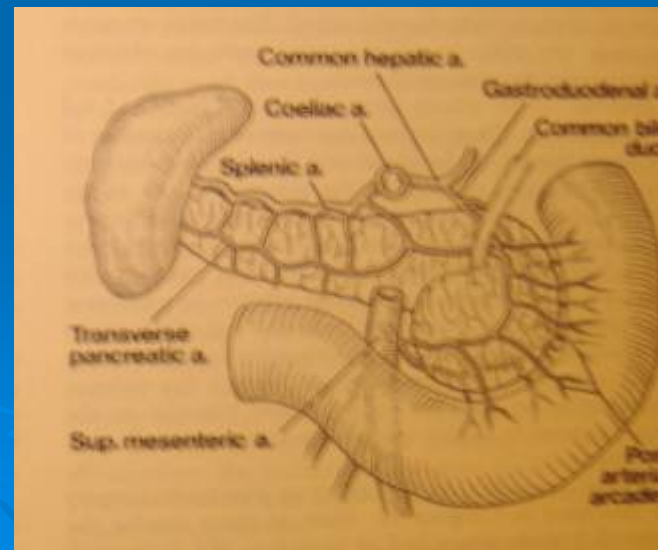
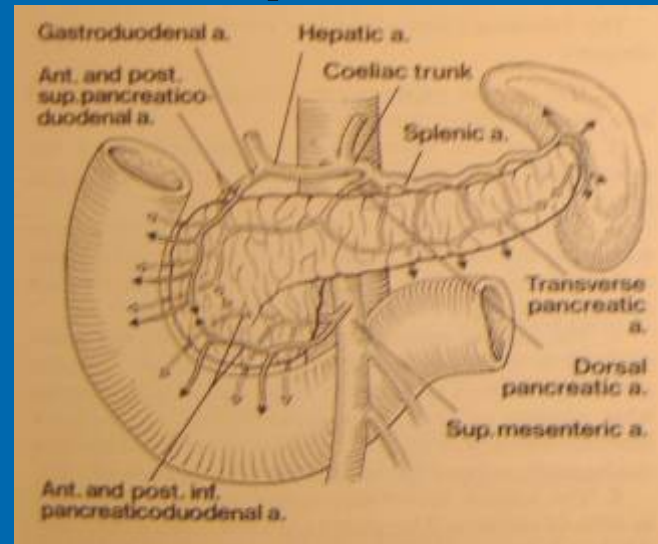
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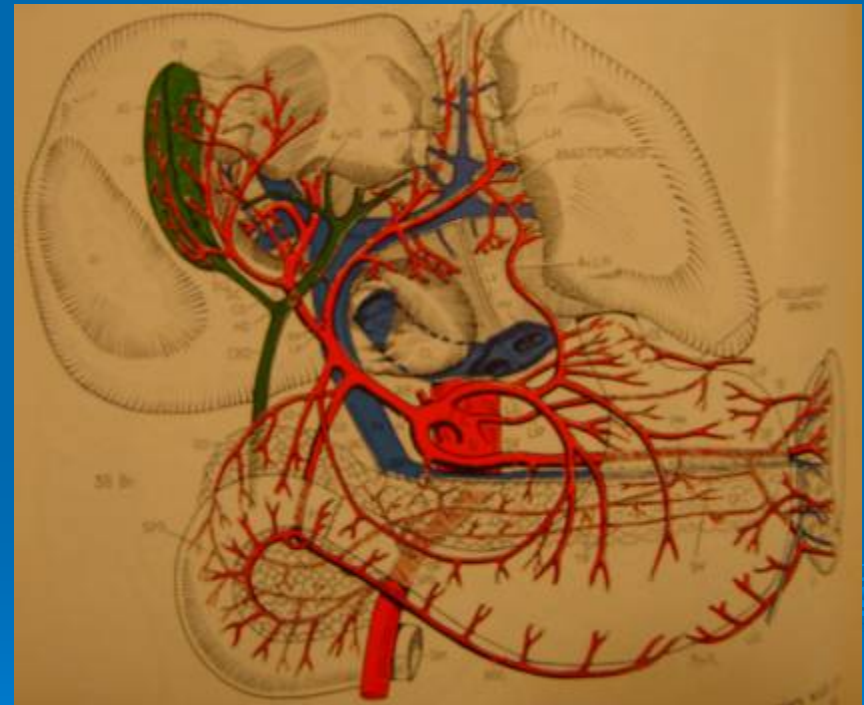
Blood supply of the pancreas

- Pancreas lies in three peripancreatic, interlocking arterial circles



Blood supply of the pancreas

- The head of pancreas is supplied by branches from two pancreaticoduodenal arcades.



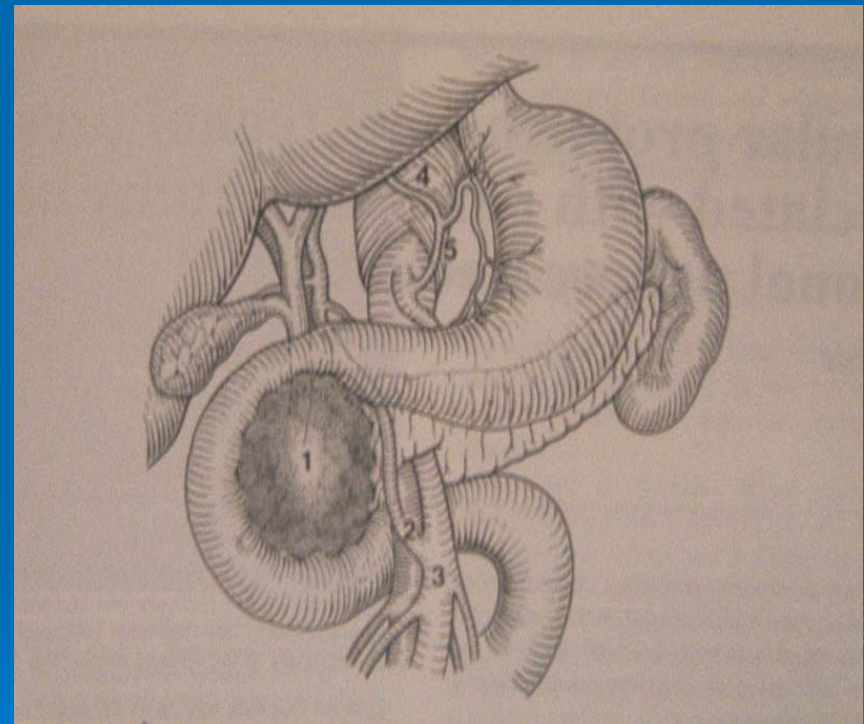
Blood supply of the pancreas

- The body and the tail receive blood supply by branches from splenic artery and the dorsal pancreatic artery




Blood supply of the pancreas

- Arterial anomalies as they relate to pancreatic surgery usually involve the common hepatic artery and its branches



Vascular problems in pancreatectomy

- 1- Congenital vascular anomalies
 - 2- Arteriosclerotic vascular stenosis
 - 3- Vascular infiltration or compression
 - 4- Iatrogenic vascular injuries.
- 

congenital vascular anomalies

- The surgeon must proceed with caution and be aware of the possibilities
- All the structure should be clearly identified before division.

congenital vascular anomalies

- Michels (1953) has cited 26 possible collateral pathways of blood supply to the liver.
- These are possible and at best probable routes that should not be relied upon too heavily when a replaced hepatic artery is damaged

(Crist et al 1987, Lansing et al 1972)

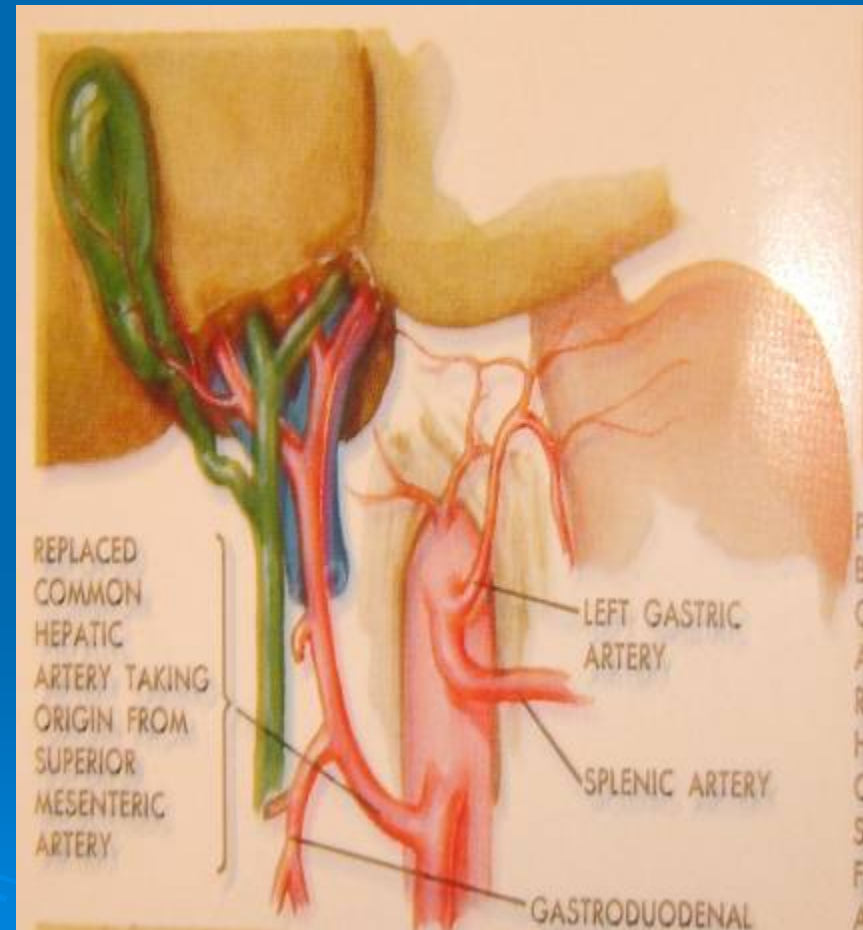
congenital vascular anomalies

- Revascularization should be attempted if any replaced artery is involved which can be performed by anastomosis of the hepatic arterial stump to one of the branches of the coeliac axis

(Rong & Sindelar 1987)

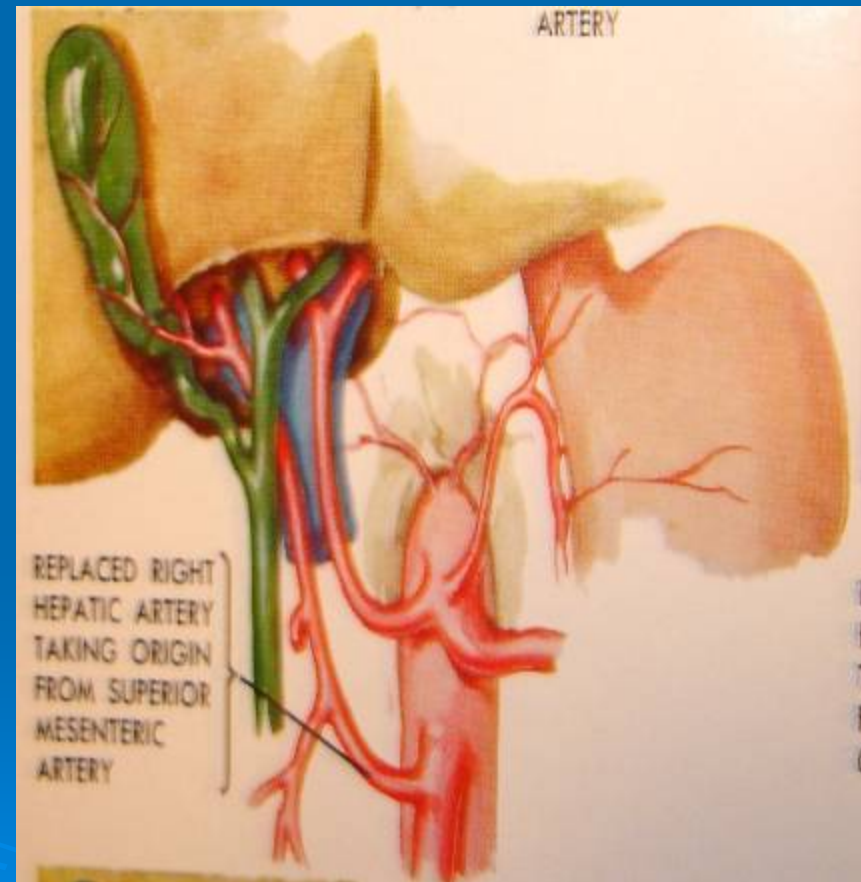
congenital vascular anomalies

- Replaced common hepatic artery taking origin from superior mesenteric artery



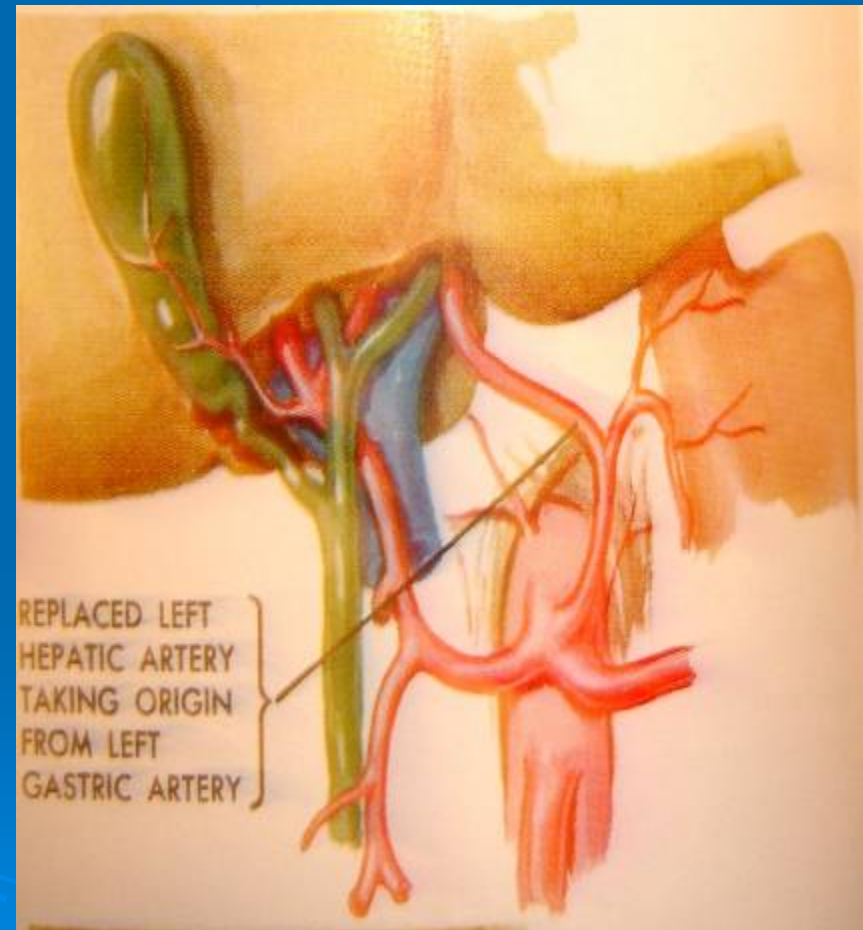
congenital vascular anomalies

- Replace right hepatic artery taking origin from superior mesenteric



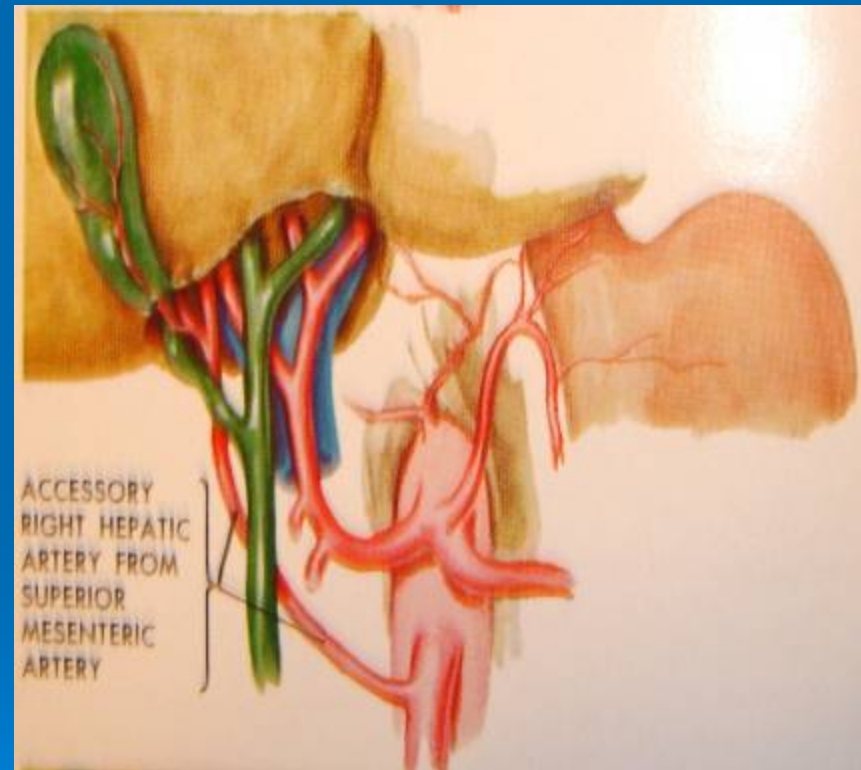
congenital vascular anomalies

- Replaced left hepatic artery taking origin from left gastric artery



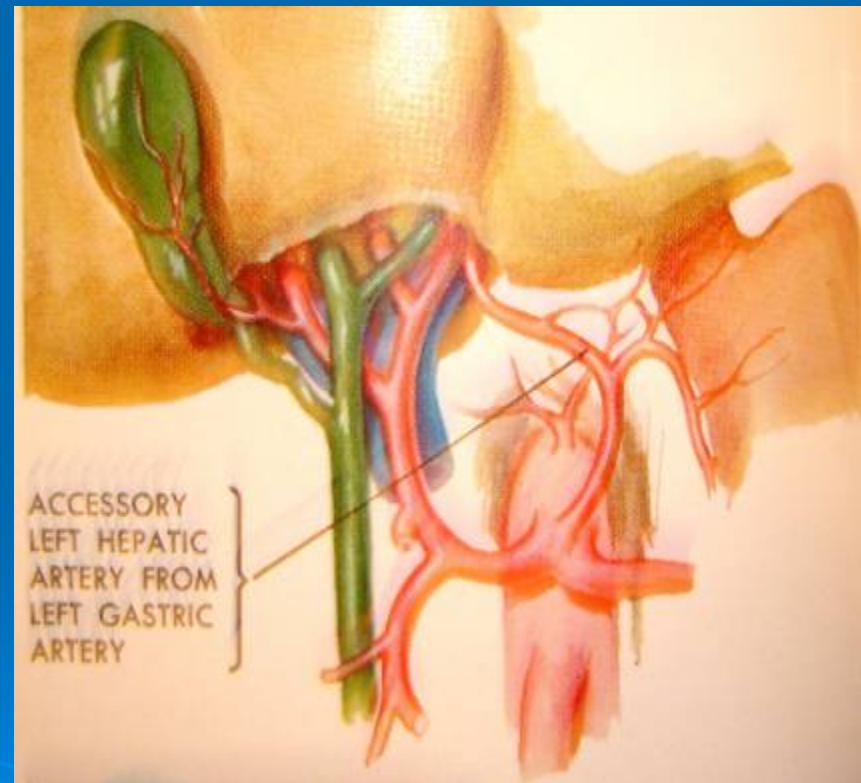
congenital vascular anomalies

- Accessory right hepatic artery from superior mesenteric artery



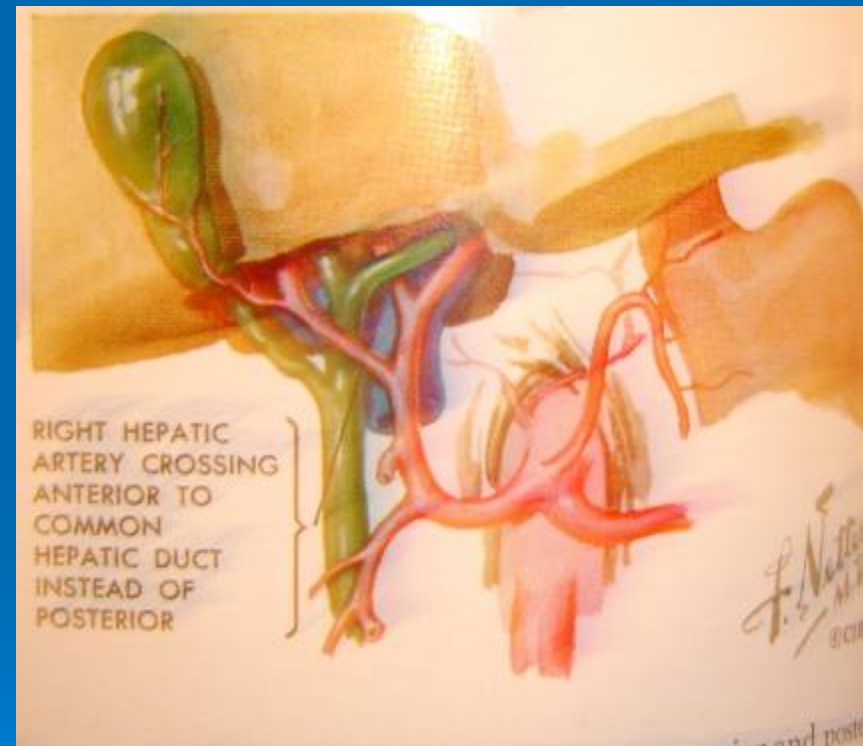
congenital vascular anomalies

- Accessory left hepatic artery from left gastric artery



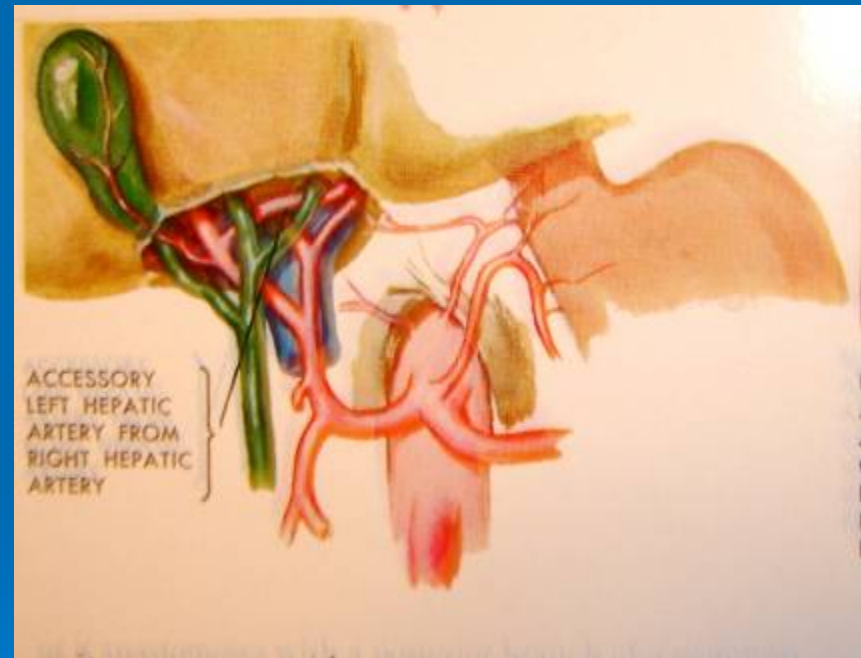
congenital vascular anomalies

- Right hepatic artery crossing anterior to common hepatic duct instead of posterior



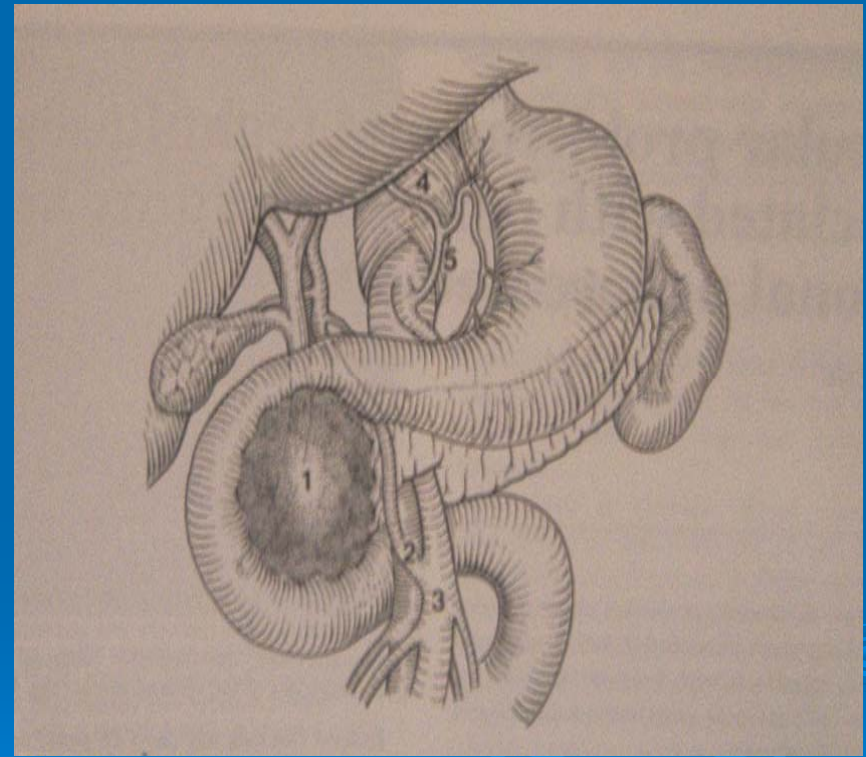
congenital vascular anomalies

- Accessory left hepatic artery from right hepatic artery



congenital vascular anomalies

- Accessory or replaced right common hepatic from SMA can be retropancreatic or run in front of the pancreatic neck

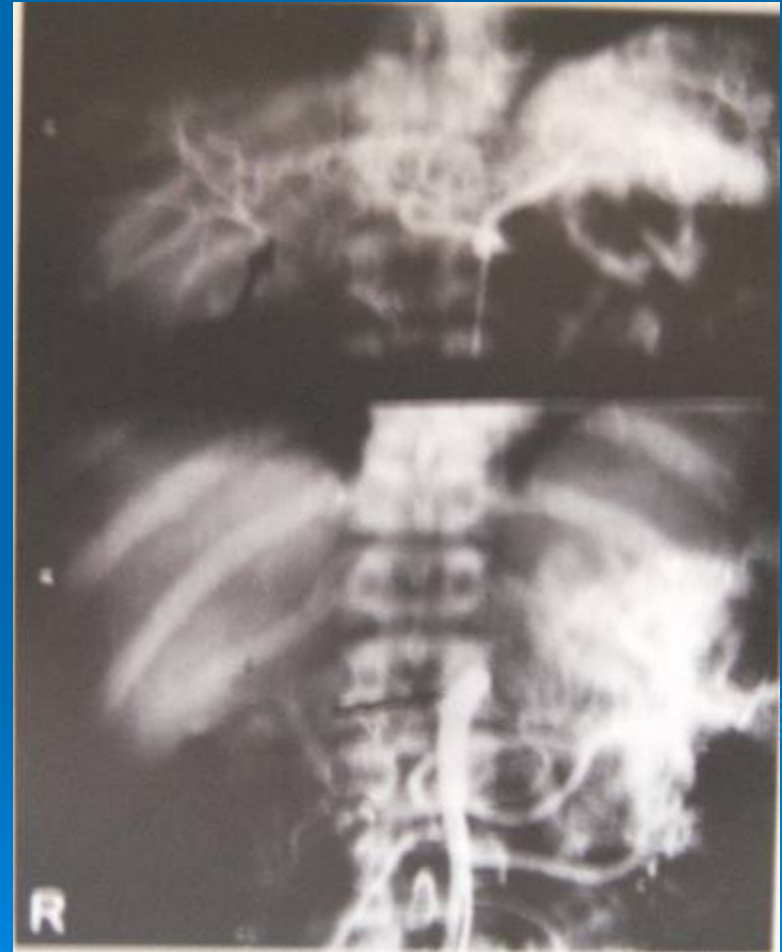


congenital vascular anomalies

- The anomalous course of an hepatic artery has been known to cause compression of the portal vein and so suggest inoperability on the preoperative angiogram.



congenital vascular anomalies

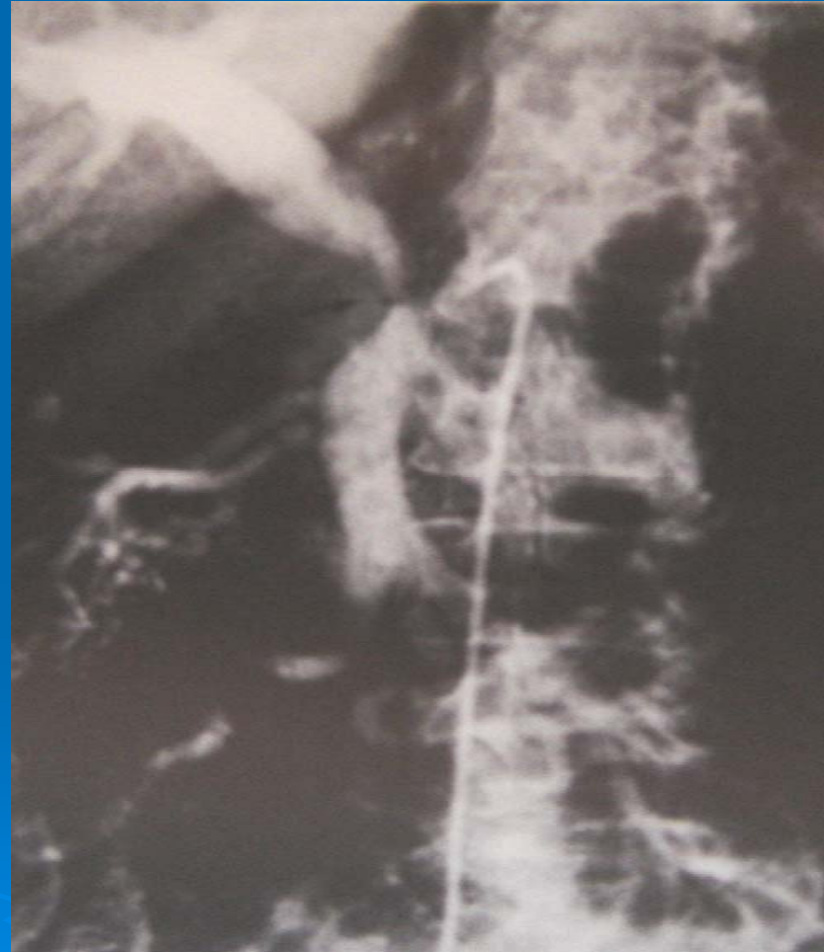


Vascular infiltration or compression

- In spite of radiographic stenosis, the tumor may still be resectable (Warren et al 1983, Warshaw et al 1990).
- Venous involvement may not be discovered until late in the procedure.

Vascular infiltration or compression

- The anomalous course of an hepatic artery has been known to cause compression of the portal vein and so suggest inoperability on the preoperative angiogram.



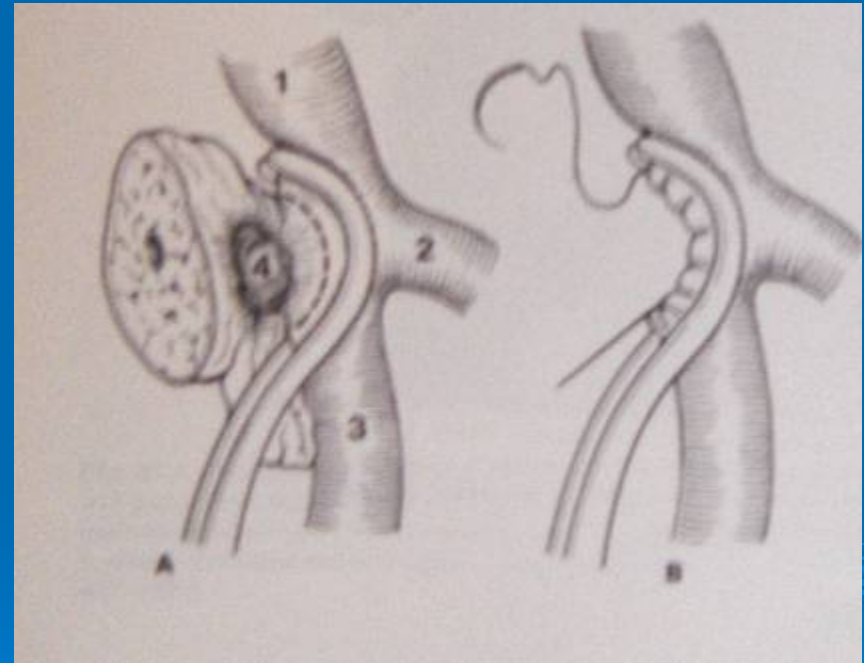
Vascular infiltration or compression

- Stenosis of the portal vein could be caused by an unusual coiling of the hepatic artery



Vascular infiltration or compression

- Tangential resection of a small segment of portal vein adherent to a pancreatic head tumour



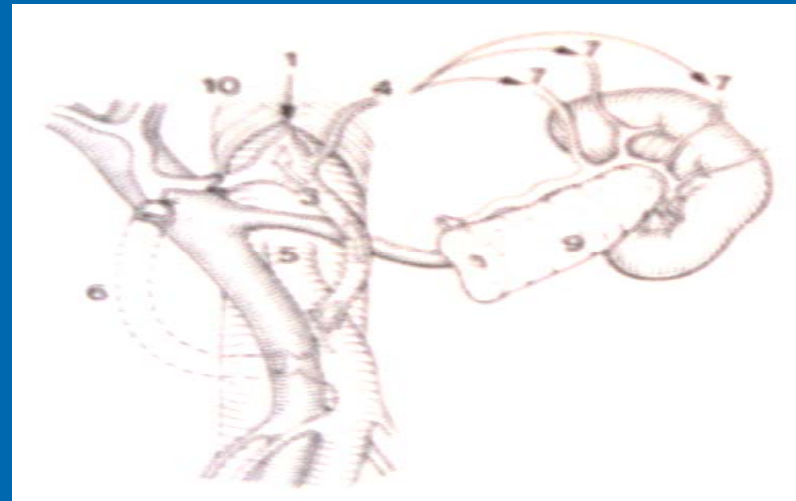
Arteriosclerotic vascular stenosis

- Obstruction of the coeliac axis is found in between 10-50% of patients undergoing abdominal arteriography (Szilagyi et al 1972)



Arteriosclerotic vascular stenosis

- The fear of potential ischemia of the liver and pancreatic tail has led some surgeons to revascularize the branches of the coeliac trunk, following the Whipple operation



Arteriosclerotic vascular stenosis

- In the majority, pancreaticoduodenectomy can safely be performed without any bypass in spite of apparent coeliac occlusion
- To be on the safe side in cases of coeliac occlusion, hepatic flow should be monitored (perhaps with a sterile Doppler probe) following preliminary occlusion of the gastroduodenal artery

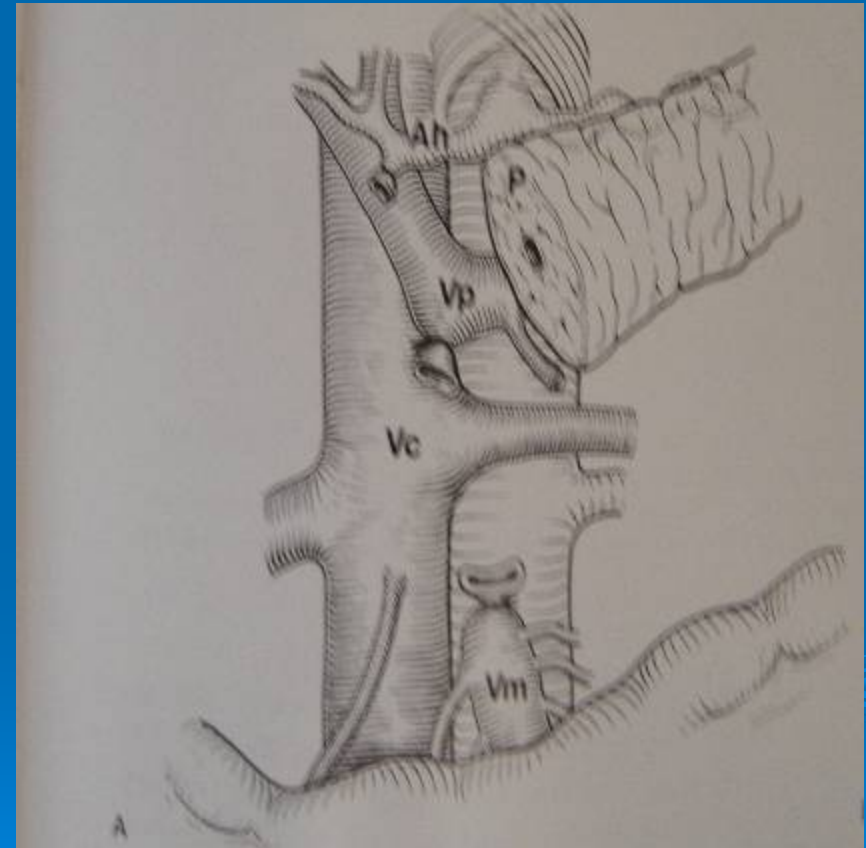
Iatrogenic vascular injuries

Venous bleeding can be voluminous particularly from the retropancreatic veins

- The safest control is obtained by local pressure
- An interposition graft is required to bridge the defect.
- The most endangered arteries are the hepatic and its branches as well as the superior mesenteric artery

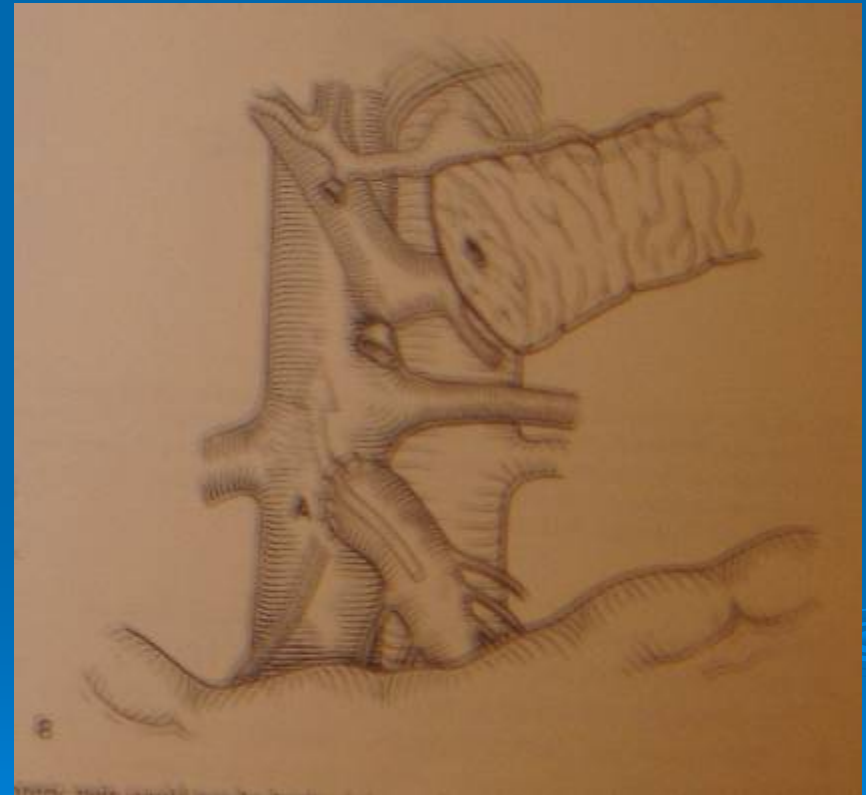
Iatrogenic vascular injuries

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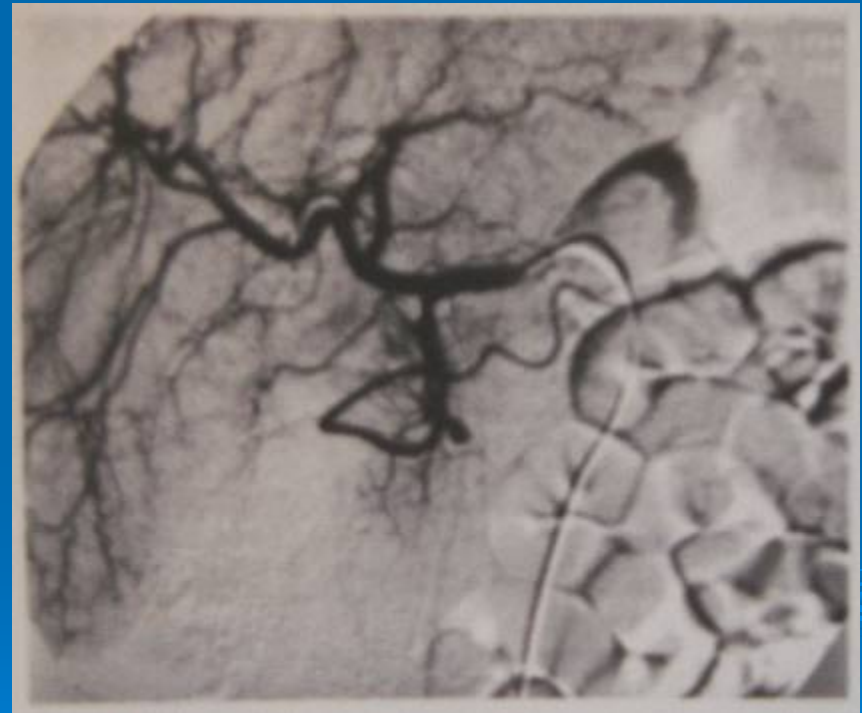
Iatrogenic vascular injuries

- A mesocaval shunt serves to drain mesenteric venous blood



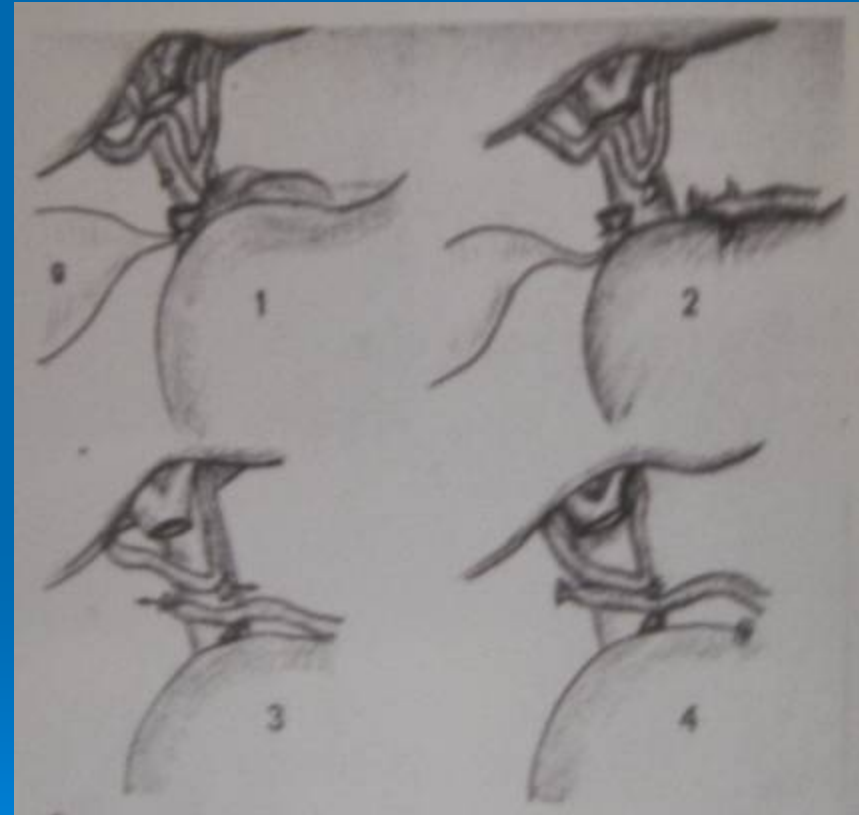
Iatrogenic vascular injuries

- Preoperative coeliac angio.



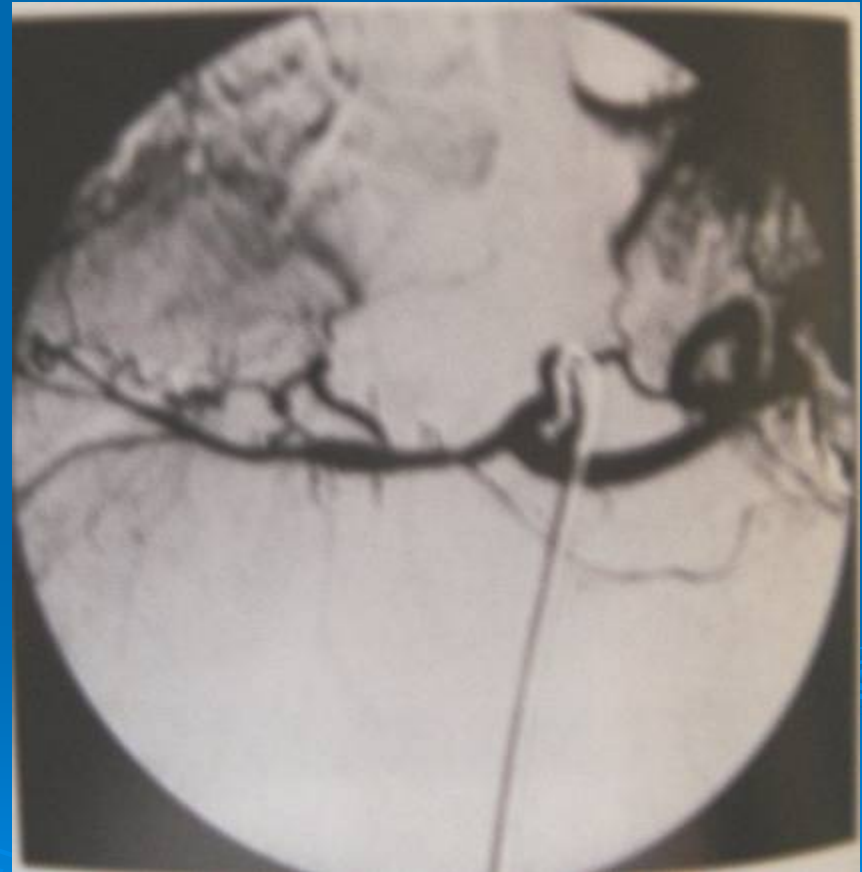
Iatrogenic vascular injuries

- If hepatic artery is accidentally divided, the damage can be best repaired by means of tension free side to side anastomosis



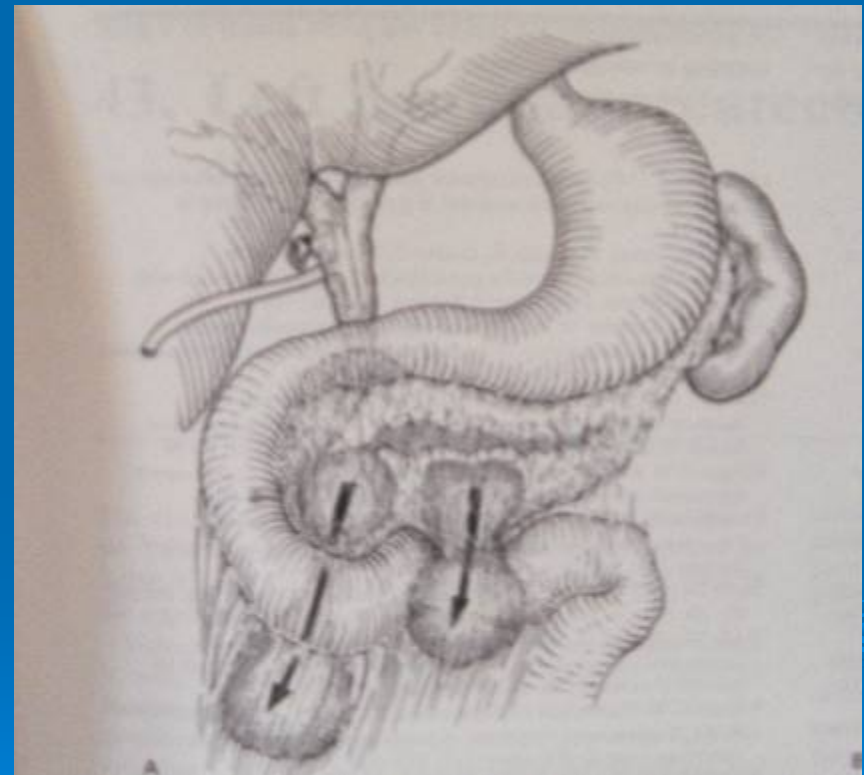
Iatrogenic vascular injuries

- Post-operative angio showing patent anastomosis.



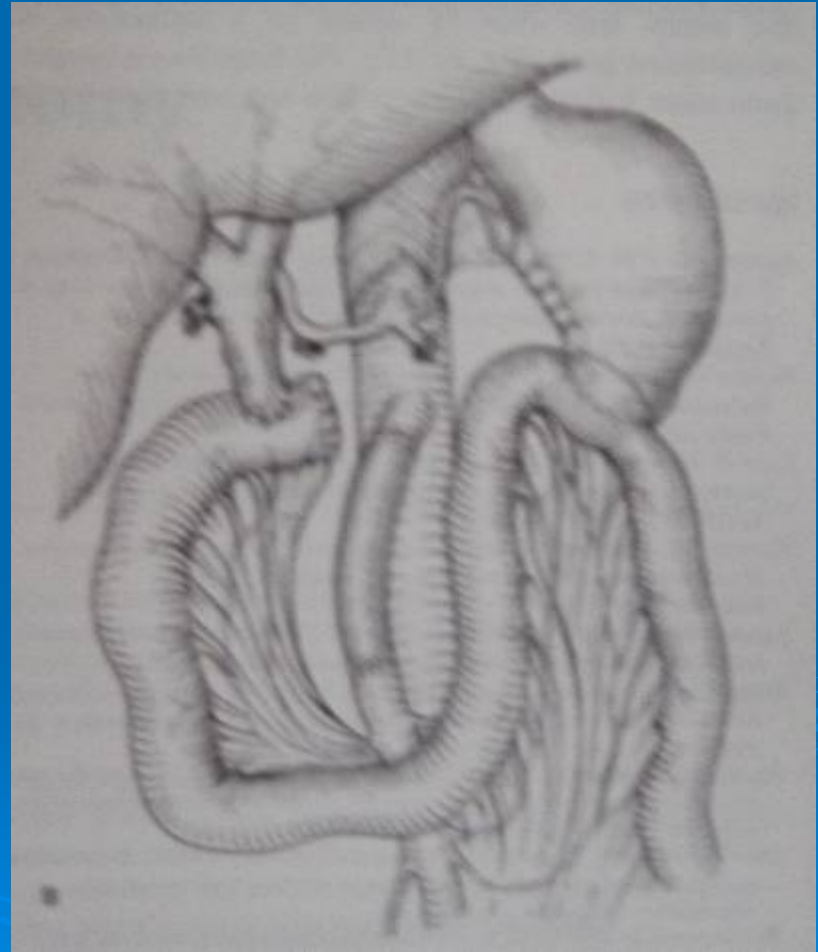
Iatrogenic vascular injuries

- Cyst penetrating into the mesenteric roots, a segment of the SMA was resected.



Iatrogenic vascular injuries

- Replaced by 5 cm saphenous vein graft



Iatrogenic vascular injuries

- Preoperative angio



Iatrogenic vascular injuries

- Post-op angio

