

NEW APPROACH TO THE SPLENIC VESSELS

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ABSTRACT

The transperitoneal approach is used systematically for an arterial or a venous splenorenal anastomosis. However, this approach is associated with high morbidity and mortality rates.

Because of our anatomical and surgical findings we have used the retroperitoneal approach to the splenic hilus by means of the lumbar region. The first splenorenal arterial anastomosis with this approach was done in 1972. The approach has proved to be less aggressive since it avoids the danger of damaging the pancreas, it is a more direct approach to the splenic vessels and it provides better exposure and facilitates the anastomosis. In addition, the loss or infection of ascitic fluid in cirrhotic patients is avoided with this approach, as well as intraoperative hemorrhaging caused by the great surplus circulation. There has been neither mortality nor complications in the 13 cases of arterial and venous splenorenal anastomoses that we have done with this method.

The splenic vessels are of interest to surgeons since the artery can be used for renal revascularization in patients with renovascular arterial hypertension and the vein can detour the blood from the portal to the caval system in patients with portal hypertension. In both instances the surgeon systematically uses the transperitoneal approach, either with an abdominal or thoracoabdominal incision. The great mortality rate and the frequency of venous and arterial complications in the splenorenal anastomosis depend, to a great extent, on the surgical trauma caused by the transperitoneal approach, in which cases the viscera must be moved.

When the transperitoneal approach is used in patients with portal hypertension, not only is ascitic fluid lost but there is surplus circulation in the surgical field, especially in the gastrosplenic and gastrocolic omentum and in the transcavity floor. This surplus circulation causes hemorrhaging and difficulties with hemostasis. However, the greatest dangers in using the transperitoneal approach involve the possibility of damaging the pancreas when the renal and splenic vessels are dissected and the fact that the pancreatic tail constitutes a serious obstacle for entering the left kidney. Also, the transperitoneal approach poses technical difficulties with the anastomosis because of the depth of the surgical field, especially in obese patients.

We have been interested in operations for renovascular arterial hypertension for many years. Because of the serious problems associated with the splenorenal arterial anastomosis when the transperitoneal approach is used we have searched for a new, more direct approach that would be easy, less traumatic and provide for familiar entrance, such as the lumbar region.

Anatomical and surgical findings permitted the use of a retroperitoneal entrance to the splenic hilus by means of the lumbar region. The first successful retroperitoneal splenorenal arterial anastomosis was done in 1972 and a successful venous splenorenal anastomosis for portal hypertension was done in 1974.

Experience has revealed that this new surgical technique provides for easy simultaneous dissection of the splenorenal vessels and a better field of exposure for the arterial and venous anastomosis. The procedure is much less aggressive to the patient and avoids complications related to the transperitoneal approach, especially damage to the pancreas, since the splenic vessel dissection starts at the hilus level of the spleen.

ANATOMICAL BASES

The pedicle of the spleen is located in the pancreatic-splenic omentum, which constitutes the cell of the splenic vessel. This omentum consists of 2 small membranes: 1) the ventral, formed by the peritoneum, is the right membrane of the rear mesogastrium and 2) the dorsal, which is the left separate membrane of the rear mesogastrium. Inside there is an adherent surface (Trietz), which joins the rear wall of the pancreas to the rear parietal peritoneum (fig. 1, A). If both membranes and the Trietz fascia are sectioned the splenic vessels can be uncovered and followed easily either proximal or distal to the splenic hilus and always by means of the retroperitoneum.

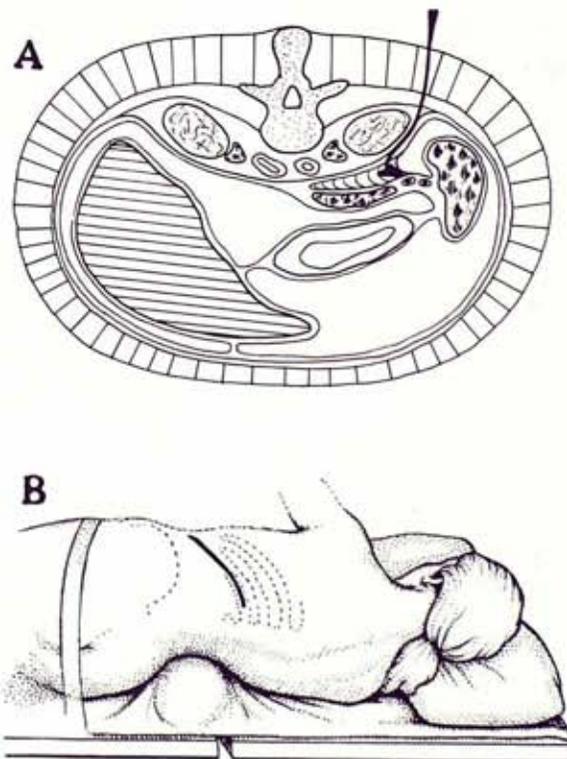


FIG. 1. A, cross section of upper kidney region shows retroperitoneal approach to splenic hilus. B, classic lumbotomy incision with resection of 12th rib.

TECHNIQUE

The patient is placed in a dorsolateral position with a pillow under the mid body. A classic posterolateral lumbotomy is used to resect the 12th rib (fig. 1, B), the renal cell is opened, and the kidney and suprarenal are reclined towards the rear wall of the lumbar space. In thin patients the splenic artery is made transparent or raised immediately above the pancreatic tail (fig. 2, A) and can be identified more easily through the rear parietal peritoneum. In obese patients the artery is located easily by palpation. It is precisely at the raised level of the splenic artery that the rear parietal peritoneum and Treitz surface are found (fig. 2, B). The splenic artery then appears and is traced by means of the thickness of the pancreatic-splenic omentum to the splenic hilus. If necessary, its bifurcation or branches can be dissected (fig. 2, C).

Normally, at this level, the splenic vein is located immediately behind and in the same channel as the artery. However,

in patients with portal hypertension the vein is the size of a thumb and found at the side of the artery. Since it shows through the dorsal membrane of the pancreatic-splenic omentum and is raised higher than the artery it is easily identified. After 4 to 6 small pancreatic veins are tied the entire circumference can be dissected until the rear of the pancreas is reached. This technique provides sufficient length in case an end-to-side anastomosis of the splenic or renal vein has to be done.

We have observed that in cases in which the spleen is enlarged the splenic and renal vessels practically touch one another since growth of the spleen causes a lumbar descent in its hilus. Eventually, the kidney is pushed and ptosis is provoked. This descent at the lengthening of the splenic pedicle facilitates venous anastomosis. In the 4 cases of splenorenal anastomosis for portal hypertension there has not been surplus circulation in the operating field and, therefore, hemorrhage or hemostasis has not been a problem.

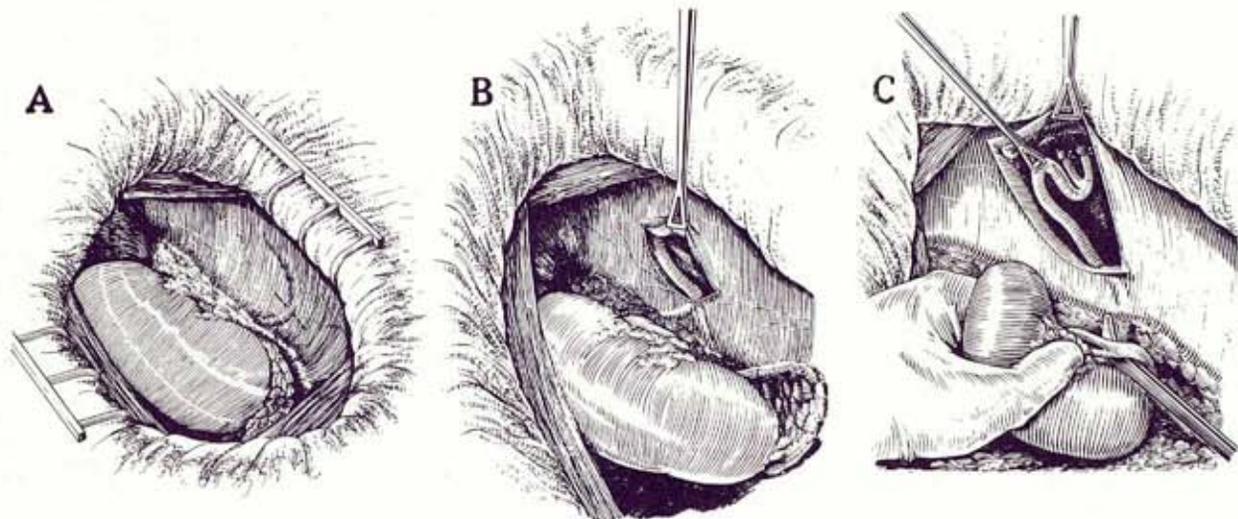


FIG. 2. A, kidney and suprarenal gland reclined sideways; splenic artery is raised above pancreatic tail. In cases of portal hypertension splenic vein is raised or shows through. B, incision of rear parietal peritoneum and Treitz surface. C, parasplenic segment of artery or paraportal segment of splenic vein is dissected.

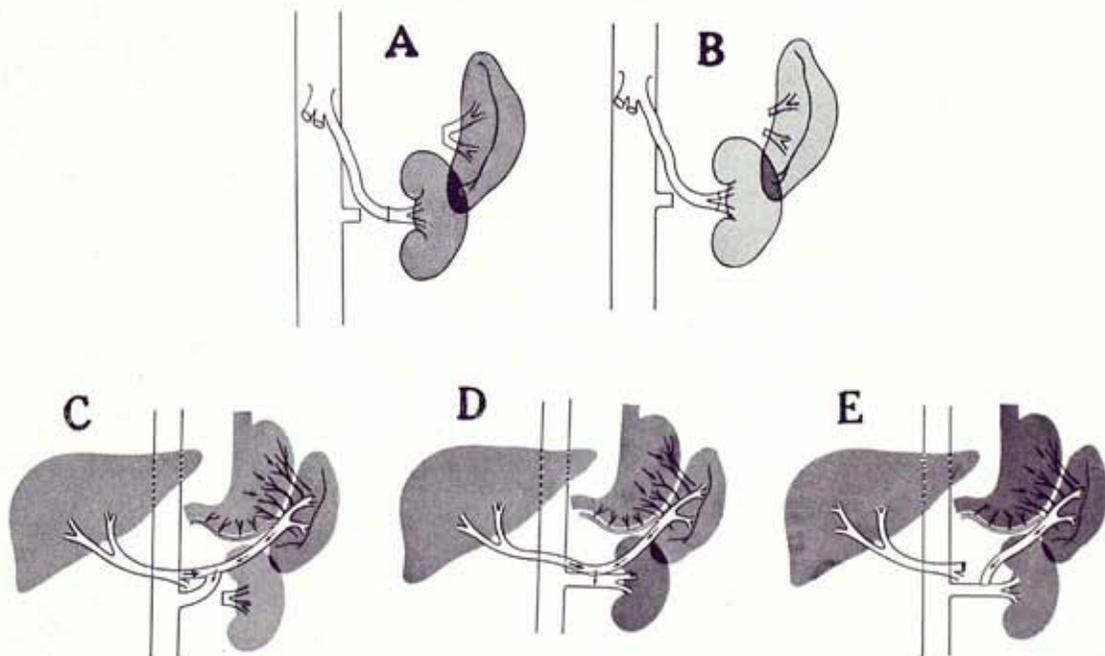


FIG. 3. A, end-to-end anastomosis between splenic and renal arteries. B, end-to-end anastomosis between splenic and renal artery branches. C, end-to-side anastomosis of splenic vein with renal vein. D, side-to-side anastomosis between splenic and renal veins. E, Warren type anastomosis (end-to-side) by retroperitoneal approach with renal hypothermia for kidney preservation.

STATISTICS

We have done 8 splenorenal anastomoses for arterial hypertension caused by stenosis of the left renal artery using the retroperitoneal approach. In 5 cases an end-to-end anastomosis of the trunk of the splenic artery to the renal artery was done (fig. 3, A) and in the other 3 cases end-to-end anastomoses of the splenic branches to the dividing branches of the renal artery were performed (fig. 3, B). In 6 cases stenosis of the left renal artery, apparently caused by arterial hypertension, necessitated the operation. Between 2 and 4 years later the 6 patients were normotensive. In the other 2 cases the operation was performed for stenosis of the left renal artery in patients with advanced chronic renal insufficiency in an attempt to improve renal function. One patient did not show any improvement and, therefore, was placed on a periodic hemodialysis program. In the remaining patient, who had an arterial hypertension that did not respond to treatment, the glomerular filtration remained stable at about 6 ml. per minute and, currently, the arterial pressure responds to small doses of antihypertensive medication. No operative morbidity or mortality occurred in any of the patients.

In treating portal hypertension we have used the retroperitoneal approach to do splenorenal vein anastomosis in 4 patients between 30 and 50 years old. These patients had cirrhosis of the liver and had had at least 1 digestive hemorrhagic episode caused by a varix. In the first case we did an end-to-side anastomosis of the renal vein to the splenic vein (fig. 3, C). In the second case a side-to-side anastomosis was done (fig. 3, D) and in the last 2 cases the Warren type anastomosis was done, in other words end-to-side of the splenic vein to the renal vein (fig. 3, E), the difference being that we used a hypothermia method by means of interarterial in situ renal perfusion to preserve the function of an

ischemic kidney. All patients, with the exception of 1 who was bleeding at the time of the operation, were well compensated when the operation was done. Followup has been 2½ years. The disappearance of the esophageal varix was confirmed and the digestive hemorrhages did not recur. The second patient on whom a side-to-side anastomosis was done started showing signs of encephalopathy 2 months after the operation and died 3 months later.

COMMENTS

The results obtained after 4 years of experience with the retroperitoneal approach have proved to be better than those with the transperitoneal approach. The retroperitoneal approach is less aggressive and more direct in reaching the splenic vessels.¹ The greatest advantage in this approach is that it does not entail the risk of damaging the pancreas and, at the same time, it permits a better simultaneous exposure of the renal and splenic vessels, thus facilitating the correct and thorough performance of the anastomosis. Dissection of the vessels at the hilus of the spleen permits using their entire length, which avoids tension problems as far as the anastomosis is concerned. The procedure does not require opening the peritoneum, which avoids loss or infection of the ascitic liquid, a danger in cirrhotic patients. The operating time is shorter than with the transperitoneal method.

The enlarged spleens do not represent an obstacle to doing an anastomosis, they actually facilitate it since the distance between the splenic and renal vessels is shortened.

REFERENCE

1. Gil-Vernet, J. M. and Caralps, A.: Letter: renal autotransplantation in the treatment of renovascular hypertension. *Lancet*, 1: 1081, 1976.