An Unusual Complication of Inferior Venacavography
A Case Report

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An unusual complication, which to our knowledge has not been described previously, occurred during percutaneous inferior venacavography.

Case Report

A 66-year-old woman was admitted to the hospital because of abdominal pain. Gastrointestinal x-ray aroused a suspicion of a mass in the region of the head of the pancreas. The vascular opacification study was undertaken in an attempt to demonstrate any deformity of the inferior vena cava.

A polyethylene catheter no. PE205, with end and side holes, was introduced into the left femoral vein by the Seldinger technic, and its tip advanced within the common iliac vein to the level of the first sacral segment. No difficulty was encountered during advancement of the guide wire or the catheter, and throughout the entire procedure a free flow of blood could be obtained. A test dose of 3 ml of Renografin 60 was injected and no adverse reaction occurred. Upon injection of 40 ml of the opaque material the patient experienced immediate and severe pain in the back, which radiated to both legs and persisted for about 5 minutes. The pain slowly subsided and at the end of 30 minutes there was no residual discomfort. Subsequent neurologic examination failed to reveal any abnormal findings.

Serial films exposed during the injection disclosed satisfactory opacification of the venous system. In addition, a second well-defined opaque column was observed superimposed upon the vertebral column and advancing at about the same rate as the column in the venous system, so that at one second after the injection the level of the twelfth thoracic segment was reached (fig. 1a). It was surmised that the epidural space had been opacified, and this impression was confirmed when an exposure, obtained approximately 5 minutes later, revealed extension of the opacification along numerous nerve root sheaths, as well as residual traces within the epidural space (fig. 1b).

Discussion

A cross-section analysis of the anatomic structures readily explains the radiographic findings (fig. 2). The external iliac vein, from its superficial position behind the inguinal ligament, passes upward and posteriorly along the brim of the lesser pelvis and joins with the hypogastric vein, opposite the sacroiliac articulation, to form the common iliac vein. The common iliac vein inclines toward the first sacral body and unites with the corresponding vessel from the opposite side to form the inferior vena cava at the level of the first sacral segment. It is only at the level of the first sacral segment that the common iliac vein is very close to the lumbosacral trunk.

It is postulated that the tip of the catheter, situated at the level of the first sacral segment, perforated the wall of the vein and entered the epidural space of the lumbosacral trunk. Even though its tip was outside the vein, the side holes of the catheter were still within the vein, so that a free backflow of blood could be obtained. During the injection some of the opaque material entered the epidural space resulting in the characteristic roentgenographic appearance that is found when the epidural space is inadvertently opacified. Most of the opaque medium, however, entered the venous system through the side holes of the catheter. Despite the perforation of the vein there was no extravasation of the opaque material into the adjacent soft tissues.

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Figure 1

A, left. Frontal view at the end of injection, showing simultaneous opacification of the inferior vena cava and the lumbar epidural space. B, right. Five minutes later, revealing characteristic roentgenographic appearance of opacification of the epidural space of the spinal canal and nerve root sheaths. Tip of catheter (arrow) at level of first sacral segment.

Figure 2
Cross-section drawing of anatomic structures at level of first sacral segment.

Summary

During inferior vena cavography the tip of the catheter perforated the wall of the common iliac vein and entered the epidural space of the adjacent large lumbosacral trunk. Anatomically it is only at the level of the first sacral segment that the vein and nerve lie in very close proximity. Simultaneous opacification of the venous system and the epidural space resulted. A severe, temporary pain occurred upon the injection of the epidural space. There was no residual neurologic deficit.
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