Case Report

Inferior vena cava - intrahepatic portal venous fistulas caused by cardiovascular foreign body

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ABSTRACT

We report here a rare case of broken angiography catheter, occluding superior and inferior vena cava lasting for 11 years presenting as communication between IVC and portal veins.(Rawal Med J 2006;31:93-94)

Key Words: Foreign body, Portal vein, Fistula, Vena Cava

CASE REPORT

A 40-year old patient was admitted to Hospital on March 28, 2004 due to an X-ray finding of a catheter foreign body in the right chest (Fig.1) The patient had undergone mitral valve dilation for stenosis of bicuspid valve 11 years back. The inferior venocavography revealed a fistula between inferior vena cava (IVC) and portal vein (Fig. 2) and a beak like termination of the IVC pointing in line to the distal end of a broken angiographic catheter. The point below the distal end of foreign body is the location of the IVC occlusion. The occlusion was located in the IVC between the level of orifices of hepatic veins above and renal vein below, or within the length of the retro-hepatic IVC.

On April 6, 2004, a right intercostal posterior-anterior thoracotomy was performed, and extracoporeal circulation with the venous drain from the left femoral vein and the left innominate vein, and arterial perfusion via the ascending aorta were installed. After cardiac arrest was secured by routine cardioplegia, the right atrium was opened along with the superior vena cava (SVC) and the angiographic catheter, was found well imbedded and fixed under a layer of calcified membrane, which was incised to expose the catheter. It was removed tediously part by part from atrium, SVC and finally from the IVC without incising its lumen. Most of the fibrous and fresh thrombi were extracted with the remained catheter (Fig.3). The right atrium was repaired with a patch of pericardium. Heart-lung machine was stopped and thoracic incision was closed in layers. The IVC – portal vein fistula was not treated, because of only mild IVC compressive syndrome. The patient developed postoperative pulmonary embolism and recovered with thrombolysis with urokinase. The bilateral limb edema was treated with medical stocking. Patient was discharged 3 weeks following surgery. Two years later, the patient did well.

DISCUSSION.

The IVC – portal venous fistulas seem impossible to occur. The chance for developing a communication between the IVC and the portal system requires a sharp device. In this case, a mitral valve dilatation had been performed 11 years ago. The Brockenbrough transseptal needle (USCI, Adult curve, 18G, 70 cm) with an 8F USCI Mullin's transseptal dilatorm is necessary to do this procedure. Its first step needs to use the Brockenbrough transseptal needle. This needle is very stiff and heavy and its curving tip is especially sharp, capable of penetrating any tissue except bone.

In inexperienced hands this curving needle is likely to injure tissue it meets. The retro-hepatic IVC, especially the groove behind the liver, which is curving but not straight, is relatively easy to be injured. The Brockenbrough transseptal needle penetrates the IVC wall and get into the liver parenchyma and then return back to the IVC. There are two mechanisms for dislodging the catheter. The first is a big hematoma formed in the liver parenchyma. Since it has both hepatic and portal venous system, the hematoma would push its blood into one of the systems, in this case the intra-hepatic portal system. Secondly, in the injured IVC, a curve is formed, and an angiographic catheter can pass through the injury with kinking, twisting or angulation of the catheter. The kinking, twisting or angulation point of the catheter is the weakest location to be broken.

The portal system serves, as matter of fact, an insufficient runoff of the IVC in this case, since the portal vein should enter the liver and ramify throughout the liver substance and ends in capillaries with a relatively high resistance, from which the blood is collected into the hepatic veins, and then to the IVC. In this particular patient, an extra microcirculation in the hepatic tissue has been added.

Our case has two interesting and rare components. First, the broken catheter tip, blocking the IVC and SVC, was essentially asymptomatic and second, a fistula between the IVC and the portal vein was formed. In conclusion, breaking of the catheter is hard to avoid completely, however, the operator should inform the patient for such accident and deal the situation as early as possible.

Fig.1. Chest X-ray shows an opaque catheter about 20 cm long, its tip is located in the right innominate vein, even partially entered into the right subclavian vein, the catheter goes down all the way passing through the superior vena cava, right atrium, and into the upper part of IVC

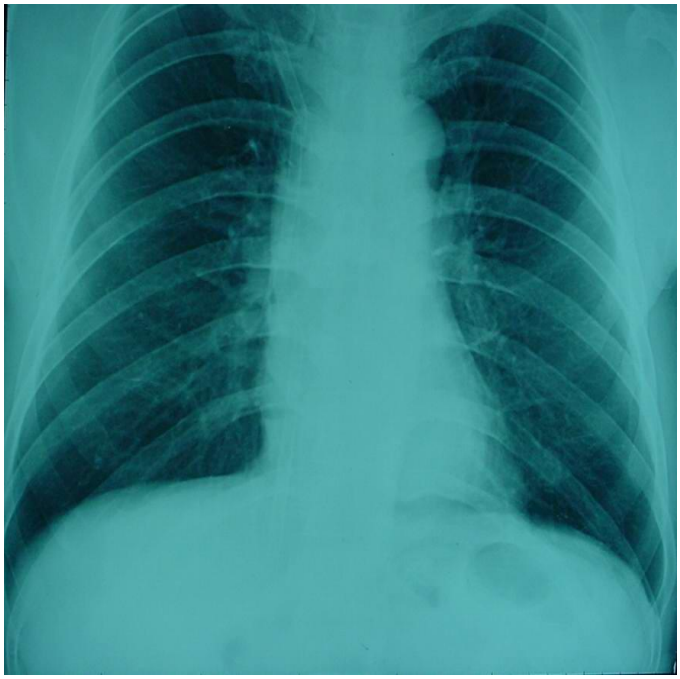

Fig.2. The cavography shows a bizarre looking occlusive termination of the IVC, presenting as beak-like ending with its sharp tip upward.

Fig.3.The removed broken catheter, fibrous tissue and thrombi.