

Application of Interventional Radiological Methods in Buddchiari Syndrome Caused by Liver Hydatid Cyst Obstructing Inferior Vena Cava

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Summary: *Interventional radiological methods were applied for the first time in Budd-Chiari syndrome resulting from liver hydatid cyst obstructing Inferior Vena Cava (I.V.C.). First balloon dilatation was applied to all of the patients and in two of them a wallstent was placed following the dilatation. In one patient, displacement of the wallstent was observed.*

Key Words: Vena Caval Obstruction, Hydatid Cyst., Budd-Chiari Syndrome, Wallstent, Angioplasty.

Hydatic disease in humans is caused by incidental infection with a dog tapeworm, the most common variety of which is echinococcus granulosus. It is endemic in countries around the Mediterranean coast, Australia and South Africa (1). Hydatid cysts located in the liver may cause Budd-Chiari Syndrome (2).

Prognosis of this syndrome is very poor resulting in death from portal hypertension and cirrhosis complications. Recently, interventional radiological methods have been applied in Budd-Chiari Syndrome therapy (3-4). Our study was performed in Türkiye Yüksek İhtisas Hospital (T.Y.İ.H.).

MATERIALS and METHODS

Interventional radiological methods were applied in T.Y.İ.H. Radiology Department between March 1990-August 1991 to patients with Budd-Chiari Syndrome caused by the obstruction of the I.V.C. due to liver hydatid cysts. All patients were female with ages ranging between 16-62 years. The symptoms of Budd-Chiari Syndrome which are enlargement of the liver, abdominal pain, and collateral circulation were present in all patients. Two patients were operated on for liver hydatid cyst prior to admission to our hospital.

An Inferior Vena Cavography was obtained and inferior vena caval pressure was measured via right femoral approach. At the same time right atrial pressure was measured via right brachial vein. Tapering obstruction was observed beneath the diaphragm in all patients. While contrast material was being injected through the left femoral vein the guide wire inserted through the right femoral vein was advanced up to the right atrium through the lesion. Lesion site was then dilated by a balloon catheter. In two patients a wallstent was also placed into the narrow lesion segment.

All patients were given 5000-10.000 u heparin during the procedure and all were advised to take 375 mg aspirin daily.

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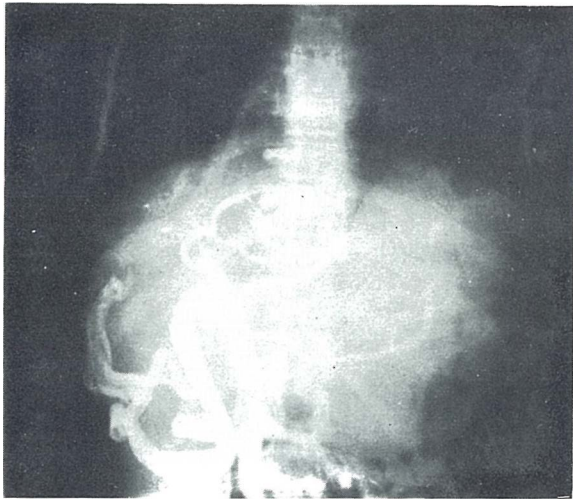


Fig. 1a) Inferior Vena Cavography: a tapering obstruction beneath the diaphragm, collateral circulation and enlarged inferior right hepatic vein.

CASE 1

A 16 year old female was operated due to liver hydatid cyst a year ago. Ultrasonography revealed, hepatomegaly and ascites, I.V.C. was obstructed and a 5.5X7.5 cm hydatid cyst was present at the point where hepatic veins drained into the I.V.C. Two more cysts having 3X3cm diameter and the remnants of the cyst which have been operated before were seen between hepatic veins. In Inferior Vena Cavography, an obstruction tapering the I.V.C. beneath the diaphragm, collateral circulation and enlarged inferior right hepatic vein were observed. (Fig. 1a)

Calcification secondary to hydatid cyst was also seen in the obstructed area. Guide wire was advanced into the right atrium through the obstructed segment. This segment was dilated with a 6mm angioplasty catheter while using a 10mm balloon catheter, it was seen that the balloon had an indentation on its left side opposite to the calcified region. When 10 atmosphere pressure was reached this indentation disappeared (fig. 1b) (However the

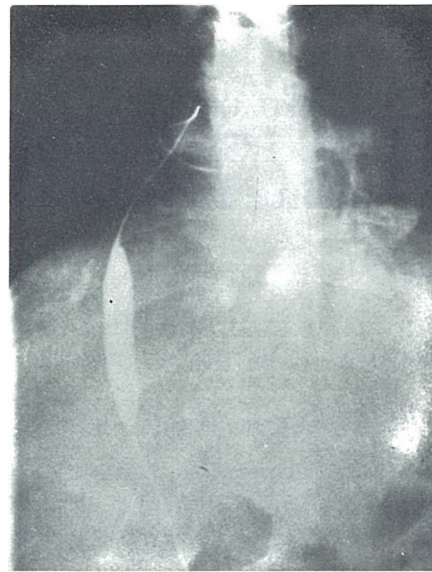


Fig. 1b) Total expansion of the balloon under maximum pressure.

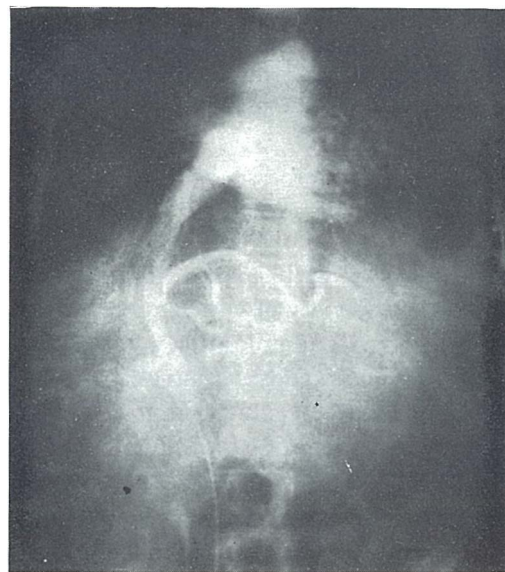


Fig. 1c) Free flow from the IVC into the right atrium in cavography after angioplasty

same indentation was seen during the dilation with a 15mm balloon catheter). Free flow from IVC to the right atrium was observed in Inferior Vena Cavography after the angioplasty procedure (fig. 1c). Preoperative pressure gradient between IVC and right atrium was 14mmHg and decreased to 3mmHg postoper-

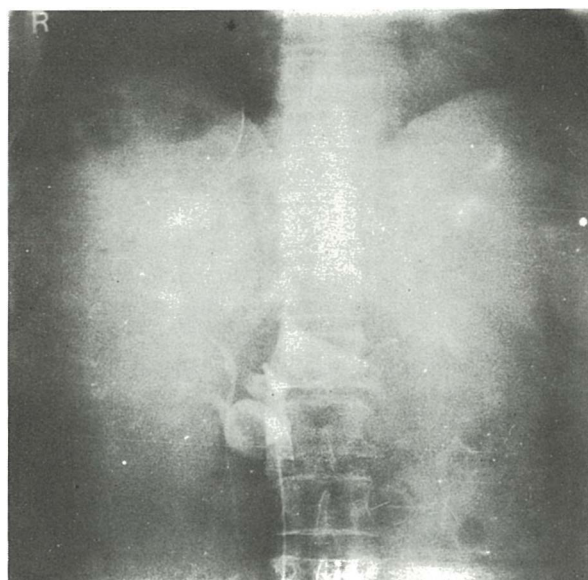


Fig. 2a) A tapering obstruction in IVC just above the renal veins and curvilinear calcification.

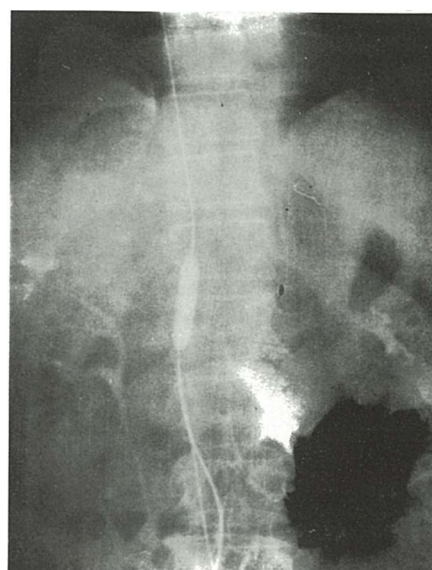


Fig. 2c) IVC and stent patent in control cavography.

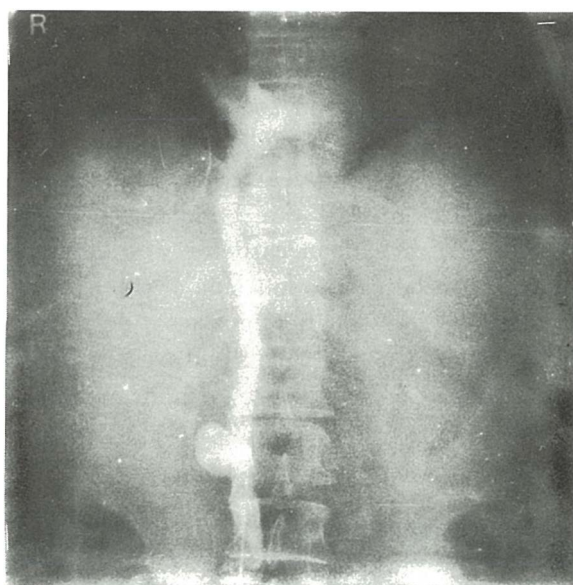


Fig. 2b) Balloon angioplasty of the obstructed segment.

ately. Control Cavography after 2 months revealed an improved clinical picture and a patent IVC. Pressure gradient was found to be 4mmHg.

CASE 2

An ultrasonography revealed hepatomegaly with a 5cm hydatid cyst at the diaphragmatic

side of the right lobe at the point where hepatic veins drain into the IVC and another neighboring calcified hydatid cyst in a 62 year old female. Shunts were seen among the hepatic veins. Inferior Vena Cavography revealed a tapering obstruction just above the renal veins and at this level blood was being drained via collaterals (Fig. 2a). A guide wire was passed into the right atrium through the stenotic segment and PTA was performed (Fig. 2b). To improve the suboptimal result produced by PTA a 10X150mm Wallstent was placed into this segment. Pressure gradient which was 10mmHg preoperatively and it decreased to 3mmHg. Control cavography revealed a patent IVC and stent. (Fig. 2c) The clinical outcome of the patient was seen to improve.

CASE 3

33. year old female was operated on 5 years ago due to a hydatid cyst of the liver.

In ultrasonographic evaluation hepatomegaly was seen and ascite was present. Hepatic IVC was obstructed and a 5x6cm calcified hydatid

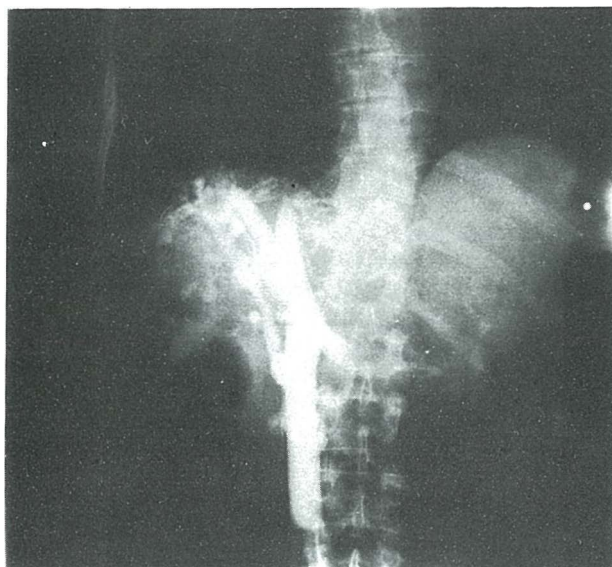


Fig. 3a) A tapering obstruction in IVC in subdiaphragmatic area, collaterals in spider web form in the liver and dilated inferior right hepatic vein.

cyst was observed at the 7th segment. Hepatic veins were dilated and communicating veins were seen.

A tapering obstruction was seen at the subdiaphragmatic area in Inferior Vena Cavography. Collaterals with a spider web form and dilated inferior right hepatic vein was observed in the liver (Fig. 3a). The right atrium was entered through the obstructed segment with a guide wire. First an angioplasty with a 8mm balloon

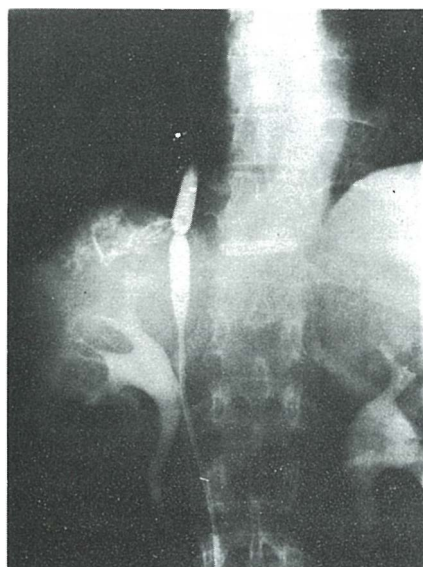


Fig. 3b) Hourglass appearances on an 8mm diameter balloon during angioplasty. Calcification due to the liver hydatid cyst is seen on the right side of this area.

catheter was performed. An indentation was observed at the obstructed area (Figure 3b). There was calcification secondary to hydatid cyst in the liver on the right side of this area. The indentation disappeared upon increasing the pressure inside the balloon. However when a 15mm balloon catheter was applied, the indentation on the left side of the balloon opposite to the calcification area persisted. This indented area was still present even when intraluminal pressure inside the balloon

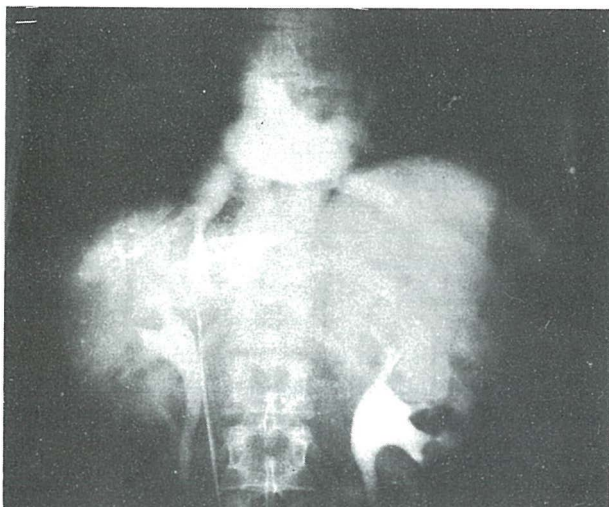


Fig. 3c) Free flow from the IVC to the opposite right atrium after PTA in control cavography.

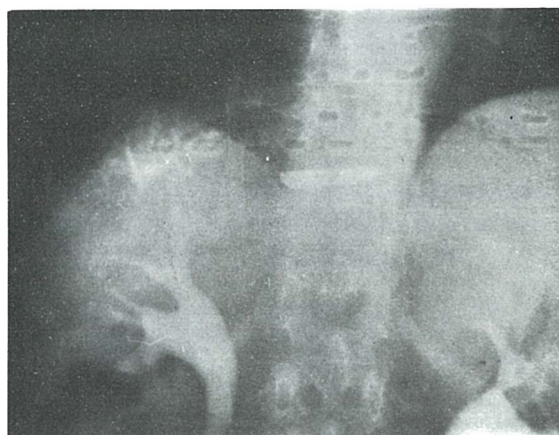


Fig. 3d) Wallstent placed within the obstruction area.

was raised to maximum. The angiograms demonstrated patency of the obstructed segment of the IVC (Fig. 3c). Pressure gradient between IVC and right atrium was 12mmHg preoperatively and was observed to be 3mmHg after the procedure.

However recurrent symptoms of the Budd-Chiari syndrome were seen in 6 months of time. For this reason balloon dilation was performed 3 times. But the obstruction was observed to be present at the same area 6 months after the initial procedure. The pressure gradient between the right atrium and IVC was found to be high and a 10x50mm wallstent was placed (Figure 3).

The patient developed hiccups after the procedure. This complication was decided to be due to the irritation of phrenic nerve branches at the point where the IVC passes through the diaphragm. Control graphy performed the next day revealed migration of the stent into the right ventricle. The stent was removed surgically and no complication was seen in the postoperative period. This unexpected complication was thought to be secondary to the hiccups. Another wallstent, wider and longer, was decided to be implant to the highly stenotic and rigid lesion area keeping in mind that surgical mortality and morbidity are very high in such cases.

DISCUSSION

Surgical management of hepatic IVC obstructions causing Budd-Chiari Syndrome presents high morbidity and mortality (5). For this reason Interventional radiological methods are being used as an alternative to surgery. New horizons came into attention with the use of metallic stents when balloon dilatation gave suboptimal results (6).

In all 3 patients with Budd-Chiari Syndrome caused by an inferior Vena Cava obstructed

secondary to liver hydatid cyst, the I.V.C. was observed to taper. This appearance represents an I.V.C. obstruction secondary to a fibrosis rather than a compression. Moreover, an area not well expanded was observed in two cases during balloon angioplasty with a 15mm catheter under maximum allowed pressure after the advancement of the guide wire through the lesion, supported our decision.

In one cases, a wallstent was placed into the obstructed area in the first session because it was a long lesion and angioplasty produced suboptimal results. During the 10 month follow up period, stent was observed to be functioning properly and clinical picture had improved.

In another case, decrease of the pressure gradient between right atrium and I.V.C. and clinical improvement following angioplasty regressed 3 times in 6 months and each time an angioplasty was performed. In the last session the wallstent was placed. But next day the stent was observed to migrate into the heart. The stent was removed surgically and no complication was seen in the postoperative period. During this operation a manual control of the stenotic I.V.C. segment through right atrium revealed a hard and a very rigid stenosis. So it was decided to place wider and longer wallstent. This finding, again, supports the idea that the obstruction is secondary to fibrosis rather than a compression.

In the last case's control two months later, the pressure gradient had returned to normal levels. The I.V.C. was observed to be patent and the clinical picture had improved.

We believe that it's still too early now to make decisions about the success of these interventional methods for Budd-Chiari Syndrome resulting from liver hydatid cyst disease. We think that further studies will clarify the long-trem success of these interventional techniques.

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