Intracystic Hemorrhage in a Patient of Polycystic Kidney with Renocolic Fistula Diagnosed by Contrast-Enhanced Ultrasonography

Emi Ishikawa¹, Masatoshi Kudo¹, Yasunori Minami¹, Kazuomi Ueshima¹, Hobyung Chung¹, Sosuke Hayaishi¹ and Kiyoshi Maekawa²

Abstract

A 60-year-old woman with polycystic kidney presented with intracystic hemorrhage; renocolic fistula was diagnosed by contrast-enhanced. The patient was admitted due to hematuria, pyuria and pneumaturia. Abdominal B-mode ultrasonography showed that this renal cyst had thickened walls and debris-like internal echo. Truagent Detection, a power Doppler imaging mode, could depict intracystic color signals after Levovist injection by real-time scan. Enhanced spots had increased in the cyst, and were shown as minimal intracystic hemorrhage in real-time. The case of polycystic kidney with renocolic fistula is rare, however contrast-enhanced ultrasonography could successfully identify the site of minute bleeding.

Key words: contrast-enhanced ultrasonography, levovist, polycystic kidney, intracystic hemorrhage


Introduction

Intracystic hemorrhage in the kidney can be diagnosed using imaging modalities, such as ultrasonography, computed tomography (CT) or magnetic resonance imaging (MRI). However, it is difficult to diagnose whether there is persistent bleeding if it is extremely minimal. Herein, we report a rare case that intracystic hemorrhage of polycystic kidney with pelviocolic fistula which was correctly diagnosed by contrast-enhanced ultrasonography.

Case Report

A 60-year-old woman came to our hospital with complaints of hematuria, pyuria and pneumaturia. She had oliguria for a long time because she had received hemodialysis due to chronic renal insufficiency caused by polycystic kidney from the age of 33. She was hospitalized due to progressive anemia. At admission, she had a slight fever, slight abdominal tenderness, and blood in stool as well. Her hemoglobin was 7.4 g/dL, white blood cell count was 13,400/mm³, CRP 18.7 mg/dL, BUN 62 mg/dL and Cr 8.74 mg/dL. Abdominal X-ray showed bilateral and multiple calcifications in the kidneys. Abdominal plain CT scan showed bilateral and multiple calcifications in the kidneys, and a low-density area equal to air density in the left renal pelvis. Fistula between the colon and renal pelvis was unclear on CT. One of the renal cysts in the left kidney was pointed as a high-density area compared with the other cysts (Fig. 1). Abdominal ultrasonography (LOGIQ 9, GE, Milwaukee, WI, USA) showed that this renal cyst had thickened walls and debris-like internal echo on B-mode image, suggesting infection (Fig. 2). On color Doppler ultrasonography, there were no blood flow signals detected inside the cysts or in the septa. Real-time harmonic gray scale sonography using 2.5 g of Levovist (Schring AG, Berlin, Germany) (400 mg/dL) did not depict any enhancement inside the cyst immediately after injection. However, spot enhancement inside the cysts was shown about 2 minutes after bolus injection on intermittent harmonic images, and the spots had subsequently spread in the cysts. Therefore, hemorrhage in the cyst was

¹Department of Gastroenterology and Hepatology, Kinki University School of Medicine, Osaka-Sayama and ²Section of Abdominal Ultrasound, Kinki University School of Medicine, Osaka-Sayama

Received for publication April 2, 2008; Accepted for publication August 14, 2008

Correspondence to Dr. Masatoshi Kudo, minkun@med.kindai.ac.jp

1977
confirmed, however the bleeding point could not be identified. Interestingly, Truagent Detection, a power Doppler imaging mode, could depict intracystic color signals about 3 minutes after Levovist injection by real-time scan (Fig. 3a). Enhanced spots had increased in the cyst for ten seconds (Fig. 3b), and were shown as minimal intracystic hemorrhage on real-time about 4 minutes later. Furthermore, the hemorrhagic site was confirmed near the color signals (Fig. 3c). Retrograde pyelography did not show any fistula between the colon and renal pelvis. However, barium enema showed the leakage from the descending colon to left renal pelvis via the renal cysts (Fig. 4). Thus, renocolic fistula was finally confirmed. After two weeks of hospitalization, the patient underwent partial descending colectomy and left nephrectomy. The renocolic fistula between the left kidney and the descending colon was confirmed in the surgical specimen. The histological finding showed severe infiltration of inflammation cells, hemorrhage and congestion at the penetration site. Thereafter, the patient remained in good condition without any postoperative symptoms.

**Discussion**

Renocolic fistula is usually caused by chronic nephritis, renal stone or renal injury of the operation. Other possible causes are renal cell carcinoma, polycystic kidney with bacterial infection, and chronic diverticulitis of colon, etc. (1-5). Because the volume of polycystic kidney tends to be large, the kidney is often in contact with the colon. Therefore, chronic inflammation between the kidney and colon could make a fistula. Renocolic fistula could be diagnosed by antegrade pyelography, retrograde pyelography or barium enema. However, it is sometimes difficult to diagnose preoperatively if the fistula is small (6). Renocolic fistula should be treated conservatively at first. However, partial colectomy and nephrectomy could be performed in patients with no functional kidney with severe nephritis. In the present case, polycystic kidney with bacterial infection made a fistula be-
Figure 4. Barium enema showed the leakage from the descending colon to the left renal pelvis via the renal cysts (arrows).

tween kidney and colon. On the other hand, the intracystic hemorrhage was caused by chronic inflammation on the other side of the infected cyst. Therefore, melena might have been produced by intracystic hemorrhage through the fistula. CT images show various findings depending on the severity of hemorrhage. In this patient, the intracystic hemorrhage was not severe and continuous. Thus, it was difficult to depict the hemorrhage on CT scan alone. On angiography, it may be difficult to detect the bleeding sites because extravasations may not be revealed with minimal bleeding of less than 0.5 mL/min (7). Contrast-enhanced power Doppler imaging and contrast-enhanced harmonic gray scale sonography could show the spot enhancement inside the cysts. Both modes of contrast-enhanced ultrasonography were useful in diagnosing minimal hemorrhage in the renal cysts. We could detect intracystic hemorrhage sites in a patient with polycystic kidney only by Truagent Detection mode using Levovist because of its high sensitivity to detect the presence of the microbubbles. It has been reported that harmonic gray scale sonography has low noise artifact and a high sensitivity for microbubbles (8). However, the acoustic power of harmonic gray scale in this study was set at the default with a mechanical index of 0.6, whereas that of power Doppler ultrasonography was set with a mechanical index of 1.0. It might be one of main reasons that power Doppler imaging was more sensitive in detecting the intracystic bleeding and intracystic projection of microbubbles than harmonic gray scale ultrasonography. Contrast harmonic gray scale sonography with Levovist intermittently obtained the images in the late vascular phase, therefore it might be one of reasons that contrast harmonic gray scale sonography using Levovist did not show the hemorrhagic site. However, Truagent Detection could successfully depict the bleeding sites by real-time scan in the late vascular phase. Truagent Detection is one of the novel contrast imaging modes; it can improve the image quality by receiving the broad band ultrasound signals. The collapse of Levovist microbubbles by strong pressure sounds could make an emission of the pseudo-Doppler signals. Therefore, high quality images could be obtained on Truagent Detection mode with Levovist because of the exclusion of the liner ingredients and the harmonic ingredients of tissue signals by loss of correlation imaging. However, Truagent Detection mode has some limitations such as blooming, overpainting, and motion artifacts. It is important to select the suitable mode of contrast-enhanced sonography in conform to its features.

In conclusion, it may be difficult to diagnose intracystic hemorrhage in a patient of polycystic kidney if the amount of bleeding is low. Here, Truagent Detection mode could successfully diagnose the bleeding and identified the bleeding site. Thus, Truagent Detection mode of power Doppler imaging should be applied to depict a small amount of bleeding or to localize the intermittent bleeding site as shown in this patient.

References


© 2008 The Japanese Society of Internal Medicine
http://www.naika.or.jp/imindex.html