**Case Report**

**Hereditary Hemorrhagic Telangiectasia**

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**Key Words**

arteriovenous malformation; hereditary hemorrhagic; telangiectasia

Hereditary hemorrhagic telangiectasia (HHT), also known as Osler-Weber-Rendu disease, is a rare disorder characterized by arteriovenous communications in visceral or gans. The diagnosis of HHT is based on clinical manifestations, although two disease-causing genes (endoglin and activin-like receptor kinase (ALK-1)) were identified in 1994 and 1996, respectively. HHT1 (endoglin) is located on chromosome 9q3 and HHT2 (ALK-2) is mapped to chromosome 12q13. The prevalence of liver involvement of HHT was reported to range from 8 to 31%. Herein, we present a 75-year-old male who was diagnosed as having HHT with liver involvement, based on the findings of recurrent epistaxis, mucosal telangiectasia on the lower lip and hepatic arteriovenous malformation. The clinical presentations of this patient are discussed, and the literature is reviewed.

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**Case Report**

Hereditary hemorrhagic telangiectasia (HHT), also known as Osler-Weber-Rendu syndrome, is a systemic vascular disorder with autosomal dominant inheritance. The diagnosis of HHT is based on clinical manifestations, although two disease-causing genes (endoglin and activin-like receptor kinase (ALK-1)) were identified in 1994 and 1996, respectively. HHT1 (endoglin) is located on chromosome 9q3 and HHT2 (ALK-2) is mapped to chromosome 12q13. The characteristics of hepatic lesion are the presence of disseminated intrahepatic telangiectasia, arteriovenous malformation with or without fibrosis. Herein, we present a case of HHT with hepatic involvement.

A 75-year-old male underwent a health examination in May 2000, and a hepatic nodule was found on routine sonography. The patient was referred to the Department of Family Medicine, Taipei Veterans General Hospital, and was then hospitalized.
Physical examinations were thoroughly performed, which disclosed mucosal telangiectasia on lower lip (Fig. 1). There was no jugular vein engorgement, no dyspnea on exertion, no peripheral edema, no audible bruit over right upper quadrant of abdomen. Recurrent epistaxis history was traced in his medical records. There was no past history of gastrointestinal bleeding. Laboratory examinations disclosed normal serum alanine aminotransferase (ALT) of 17 (reference range: 0-40 U/L), aspartate aminotransferase (AST) of 17 (reference range 5-45 U/L), alphafetoprotein (AFP) of 3.65 (normal range < 8.5 U/L), carcinoembryonic antigen of < 3.7 (normal range < 6 U/L), and negative hepatitis B surface antigen and antibody to hepatitis C virus. Chest X-ray showed chronic infiltrations over bilateral lower lung fields, and no active lung lesion was found.

Doppler ultrasonogram showed a hypoechoic nodule 1 cm in size in the left hepatic lobe, which was associated with nearby tortuous arterial structures chiefly supplied by the left hepatic artery. The presence of the pulsatile flow in the nearby portal vein was also demonstrated, (Fig. 2). Ultrasonographic appearance was compatible with the diagnosis of arteriovenous shunt.

Fig. 1. The lips of the patient showing several spots of telangiectasis. (arrows).

Fig. 2. Doppler ultrasonographic demonstration of abnormal flow patterns in hepatic arteriovenous malformation. (A) Real time sonography showing a small hypoechoic nodule in the segment III of left hepatic lobe (arrows). (B) Color Doppler sonography revealing a hypervascular lesion (arrowheads) with prominent marginal color flow signal (arrows) in the same region (segment III) of left liver. (C) Spectral Doppler showing pulsatile arterial flow with relatively low resistance index (0.59) in the supplying artery. (D) Spectral Doppler of the drainage vein showing minimally pulsatile pattern.
ing. Contrast-enhanced computed tomography (CT) disclosed two hepatic nodules with contrast enhancement in arterial phase on S3 and S7, respectively, which were both 1.5 cm in diameter. However, no CT evidence of shunting or drainage vein could be demonstrated because dynamic study was not performed.

Therefore, celiac angiography was arranged to clarify the vascular structure.

Celiac angiographic study revealed multiple small irregular hypervascular foci in both lobes of the liver with arterial phase enhancement including two previously identified lesions on CT. Arteriovenous malformation was particularly favored due to the ill-defined margin of the lesions, which were surrounded by abnormal vascular structure (Fig. 3). The upper gastrointestinal endoscopy revealed no telangiectatic lesion but an ulcer in the lesser curvature side of angularis portion of stomach. Familial screening was not available due to refusal. According to the evidence of recurrent epistaxis, mucocutaneous telangiectasia and a visceral vessel, the patient was diagnosed as HHT with hepatic involvement. He currently remains uneventful, one year after the diagnosis of HHT.

**Discussion**

HHT is a vascular disorder with diverse manifestations. The classical diagnostic triad is composed of familial occurrence, recurrent epistaxis, and mucocutaneous telangiectasia. However, Shvolin et al. modified the diagnostic criteria according to the Scientific Advisory Board of the HHT Foundation International by addition of the visceral vessel. Although two disease-causing genes were identified as etiology, the diagnosis of HHT remains clinical by the presence of these characteristic findings.

The clinical presentation of HHT is variable, depending on the number of visceral vessels and severity of the involved or gan dysfunction secondary to the lesions. Telangiectasia in HHT patients is usually found in lung and gastrointestinal tract. One case presenting recurrent gastrointestinal bleeding and high output cardiac failure was described in Taiwan in 2000. Hepatic involvement is found in 8-31% of HHT patients. The common symptom of hepatic HHT includes fatigue, peripheral edema, and ascites. The symptoms are related to heart failure with high cardiac output, which is caused by a large left-to-right intrahepatic shunt. Furthermore, right upper quadrant pain and an audible bruit may be found due to increased blood flow through hepatic arteriovenous shunting. However, half of the cases are asymptomatic and liver function tests are usually well preserved despite extensive fibrovascular dysplasia. The diagnosis of hepatic involvement in HHT patients is usually incidental as in this case.

Ultrasoundographic findings of these patients may include an abnormally dilated common hepatic artery, multiple accessory vessels (arteriovenous malformations) and the presence of dilated hepatic veins. Color Doppler ultrasonography may show...
high-velocity flow in the hepatic artery and its branches as in arteriovenous anas to mos.\textsuperscript{18-19} Contrast-enhanced CT scans may dem on strate a prom inent hepatic arterial flow and is usu ally as so ci ated with dilated hepatic and/or por tal veins. Dy namic CT scans of the hepatic veins may re veal the fill ing ki net ics of the hepatic artery, por tal vein and he pac veins and dif fuse telangiectases in the hepatic paren chyma.\textsuperscript{20} CT can be used to con firm sono graphic find ings. Mag net ic res onance imag ing (MRI) may show he pac vascular ab nor mal i ties on both T1 and T2-weighted imag es. MR angio gram pro vides a map of fill ing ki nets. MRI should be con sid ered as a pow er ful mod al ity for fol low-up of these ab nor mal i ties in pa tients with HHT. The angio graphic ap pear ance of HHT with liver in volve ment may in clude enor mously di lated and tor tu ous hepatic ar ter y, which in di cates marked in crease of blood sup ply to the liver. Early fill ing of he pac and/or por tal ve nous branches may also be found in di cat ing the pres ence of ar terio ve nous shunt ing.\textsuperscript{21} Angio graphy should be per formed to eval uate the ab nor mal i ties of he pac ves ses and col lat erals and if nec es sary, to de ter mine the need for transarteri al em bol iza tion.

De spite the ab sence of ar terio ve nous shunt ing in con trast-en hanced CT in this pa tient, the celiac angio graphy showed hy perva sular le sions in ar ter i al phase com pat ible with ar terio ve nous mal for ma tion. This pa tient was catego rized as a pos si ble case of HHT based on clas sic triad (fa mil ial oc cur rence, re cur rent ep istaxis, and mu cocuta neo us telangi ectases), but turns out to be a de fi nite case in the newly mod i fied di ag nos tic cri te ria. Un for tu nately, the fam ily his tory was un clear but the fam ily mem bers are liv ing in Main land China, and re fused fur ther eval uation. Nev er the less, the di ag no sis is still valid. Ge net ic sur vey is not cur rently sug gested for di ag no sis, but may play a role in fam ily screen ing to avoid invasive angio graphic studies.\textsuperscript{22}

References


