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CASE REPORT | LIVER

Life-Threatening Intraparenchymal Hemorrhage of Steroid-Induced Hepatic Adenomas in a Healthy Man

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ABSTRACT

Hepatocellular adenomas are uncommon benign epithelial tumors of the liver that are associated with several risk factors such as anabolic androgens and oral contraceptive pills. They may present as incidental findings, with abdominal pain or hemorrhage. This case report details the presentation and management of a life-threatening hepatocellular adenomas hemorrhage in a seemingly healthy 28-year-old man. After initial conservative management, a clinical deterioration prompted urgent reevaluation and successful embolization of the liver through transarterial embolization. As oral contraceptive pills use and anabolic steroid abuse have become more prevalent in recent decades, we may begin to see more of these presentations.

INTRODUCTION

Hepatocellular adenomas (HCA) are uncommon benign epithelial tumors of the liver more frequent in women, with an estimated incidence of 1–1.3 per 1,000,000 in women not exposed to the oral contraceptive pill (OCP) and 30–40 per 1,000,000 in those taking the OCP.[1] HCAs or hepatic adenomas are associated with several conditions, including genetic diseases, such as glycogen storage disease and familial adenomatous polyposis, and modifiable risk factors, such as the OCP, metabolic syndrome, and anabolic androgen use (eg, in treatment of Fanconi and aplastic anemias and in bodybuilders to gain muscle mass).[2–4] Although HCAs are usually solitary lesions and are often incidental findings, significant complications such as intraparenchymal hemorrhage or malignant transformation may occur.[5]

CASE REPORT

We present a 28-year-old man who attended the emergency department with acute onset severe right upper quadrant pain with associated vomiting sustained while lifting weights in the gym. There was no contributing surgical history. Medical history revealed the use of anabolic steroids, human growth hormone, and testosterone over the previous 6–7 years to gain muscle mass. Abdominal examination revealed a nondistended abdomen with focal tenderness and guarding in the right upper quadrant. Vital signs recorded a blood pressure of 190/85, heart rate of 83, and oxygen saturation of 96% on room air. Laboratory investigations revealed a hemoglobin of 17.1 g/dL, neutrophilia, and a normal C-reactive protein. Liver function tests were elevated, with a mixed hepatitic and obstructive pattern, with bilirubin 35 μmol/L^{-1}, Gamma-glutamyl transferase 443 U/L^{-1}, and alanine aminotransferase 848 U/L^{-1}. The international normalized ratio was within the normal range.

Contrast-enhanced abdominal computed tomography (CT) revealed a 9.6 cm well-circumscribed abnormality in segment 5 of the liver and a smaller focal lesion in segment 6, consistent with acute hemorrhage into 2 focal liver lesions, likely HCAs (Figure 1). Notably, the liver capsule was found to be intact, and there was no extrahepatic fluid. The patient was placed nil by mouth, commenced on intravenous fluids, provided analgesia, and covered with broad-spectrum intravenous antibiotics. Liver magnetic

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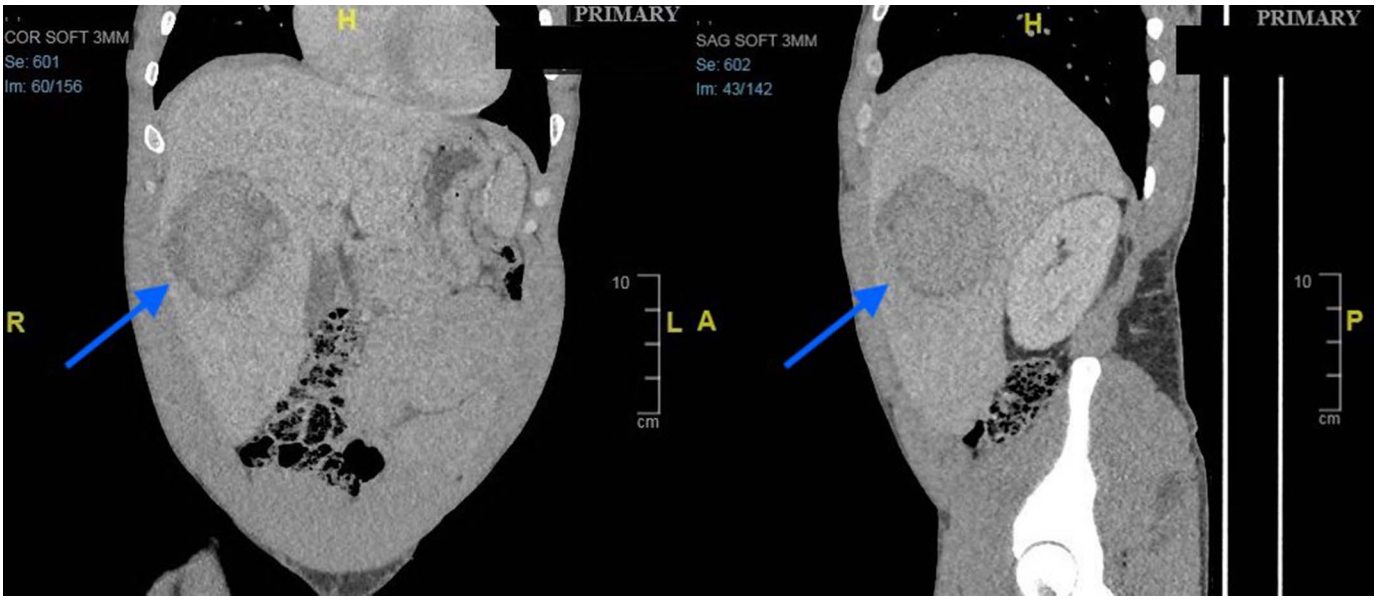

Figure 1. Contrast-enhanced computed tomography scan showing a 9.6-cm well-circumscribed abnormality in segment 5 of the liver, consistent with acute hemorrhage of a hepatocellular adenoma.

resonance imaging (MRI) revealed multiple hepatic adenomas and showed an increase in the size of the larger lesion to 12 cm (Figure 2). As the patient was hemodynamically stable, conservative management was continued with input from hepatobiliary surgery, hepatology, and microbiology.

On day 3, the patient developed worsening abdominal pain, tachycardia, and pyrexia. Hemoglobin dropped to 11.2 g/dL. The patient was stabilized and transfused with 2 units of packed red blood cells because of suspected hemorrhage and was transferred to the high-dependency unit. Repeat CT showed progression in size of the intraparenchymal bleed to 19.5 cm. CT angiogram revealed an enlarged coeliac trunk with tortuous right hepatic arterial branches and active arterial extravasation, consistent with ongoing hemorrhage (Figure 3). The patient subsequently underwent interventional radiology-guided transarterial embolization (TAE) of the liver. Three foci of active arterial hemorrhage were embolized using microcoils (Figures 4 and 5). The patient's clinical condition stabilized. Repeat CT 24 hours postprocedurally confirmed a stable appearance of the hematoma (Figure 6). Inpatient recovery was protracted with the gradual normalization of liver function tests and international normalized ratio. Discharge was on day 17, and a follow-up biopsy was scheduled to subtype the HCA and investigate the hepatic parenchyma for further anabolic steroid-related changes. The patient will ultimately undergo interval resection of the HCAs.

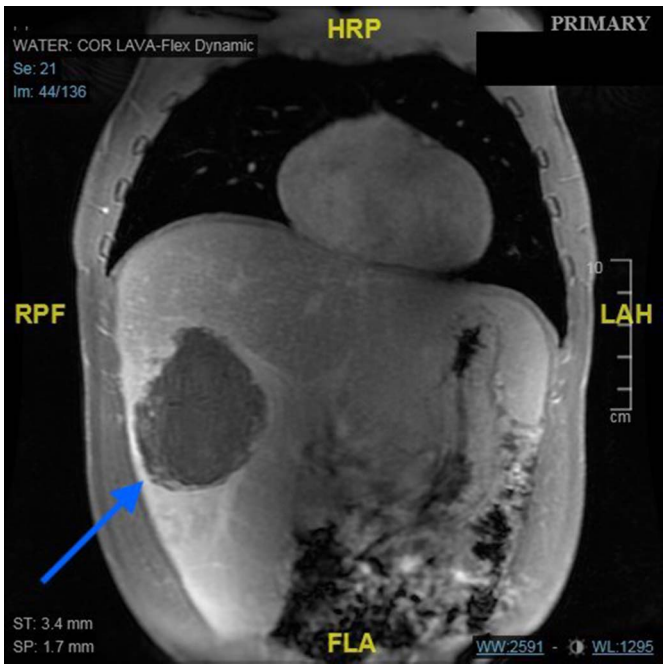

Figure 2. Magnetic resonance imaging of the liver which supported the diagnosis of multiple hepatic adenomas and showed an increase in the size of the lesion to 12 cm.

DISCUSSION

This case details an unusual and life-threatening hemorrhage of multiple HCAs in a young man precipitated by anabolic steroid use. A global increase in OCP use (although at lower doses) and ongoing anabolic steroid abuse means we may begin to see more of these presentations.[6–8] HCAs may present in various ways such as incidental findings, episodic abdominal pain, or acute hemorrhage, which may complicate 21%–40% of cases.[9] Imaging with cross-sectional, contrast-enhanced, multiphasic MRI scans is usually sufficient for diagnosis, especially in women or those without background cirrhosis. Confirmatory liver biopsy is rarely necessary.[9] Differential diagnoses include focal nodular hyperplasia, hepatocellular carcinoma, and metastatic disease.

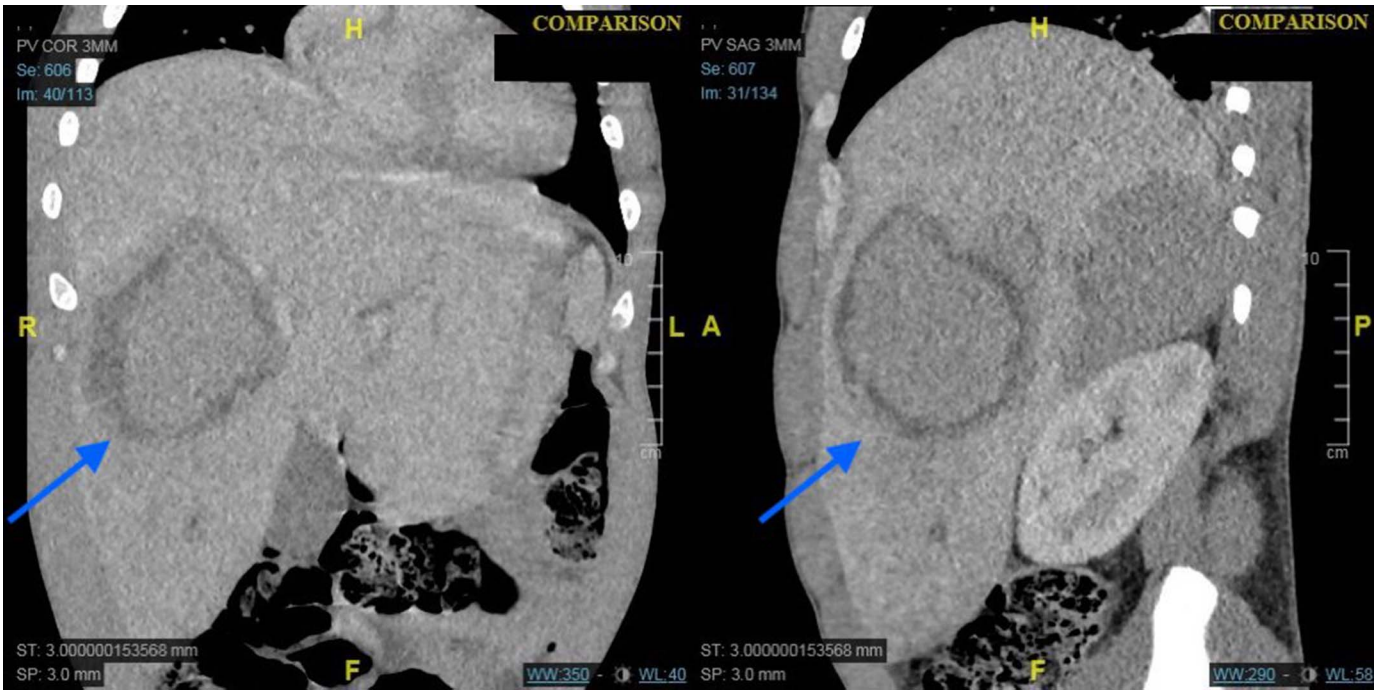

Figure 3. Computed tomography angiogram showing active arterial extravasation, consistent with ongoing hemorrhage of the lesion.

Several subtypes of HCA exist, including hepatocyte nuclear factor-1 alpha (HNF-1α) mutation, inflammatory HCAs, and HCAs with β-catenin activation. HNF-1α mutations are seen almost exclusively in women and have a low risk of complications, particularly for small lesions (<5 cm). Inflammatory HCAs are also more common in women and are associated with elevated body mass index and alcohol intake. These have the highest risk of hemorrhage. Although HNF-1α and inflammatory HCAs make up most of the HCAs and are

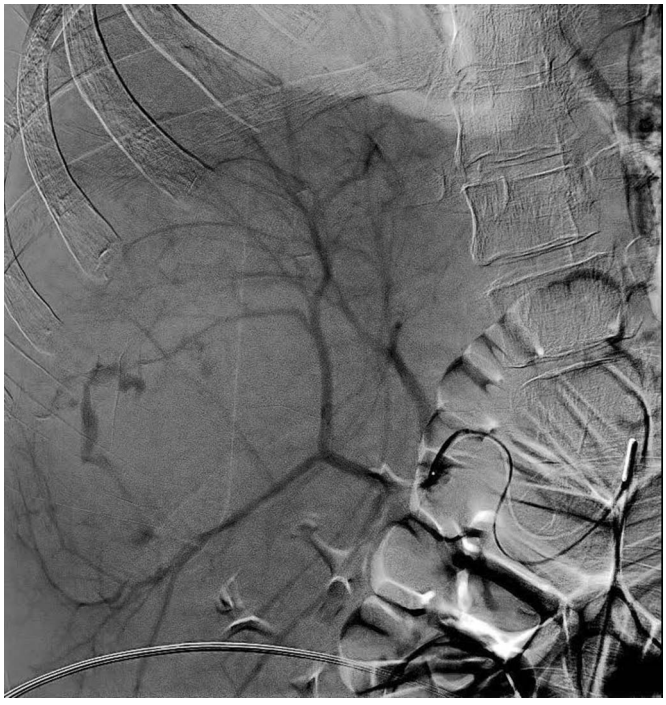

Figure 4. Branches of the right hepatic artery preinterventional radiology-guided transarterial embolization. There were 3 foci of active arterial hemorrhage which were embolized with microcoils.

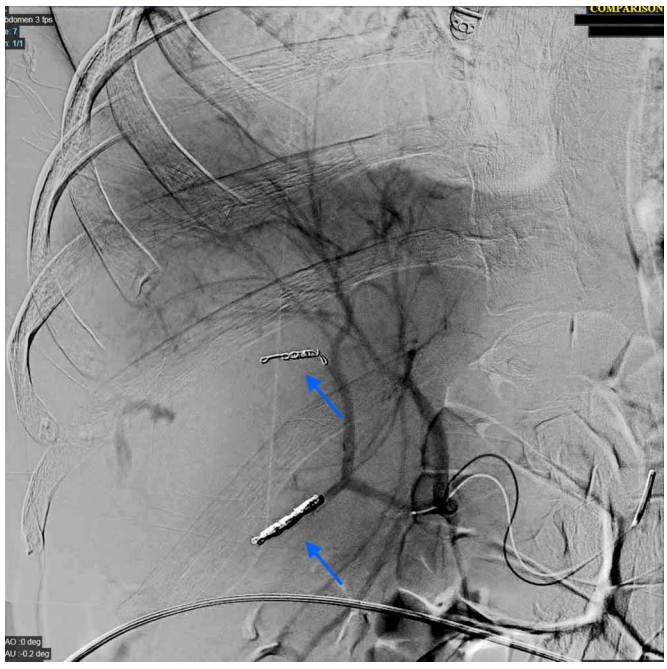

Figure 5. Branches of the right hepatic artery postinterventional radiology-guided transarterial embolization. There were 3 foci of active arterial hemorrhage which were embolized with microcoils.

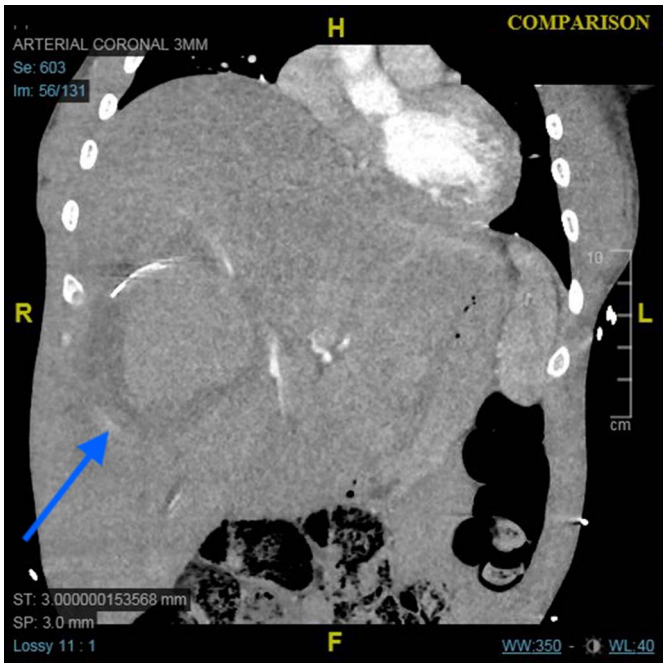

Figure 6. Repeated computed tomography scan at 24 hours post-transarterial embolization showing a stable appearance of the hematoma.

usually seen in women, the β-catenin subtypes are more frequently seen in men and are associated with androgen use as well as glycogen storage disease and familial adenomatous polyposis. HCAs with β-catenin activation comprise 10%–15% of all HCAs and have the highest risk of malignant transformation, with studies showing up to 46% have features of hepatocellular carcinoma or borderline malignant change on resection.[9–11]

Management is dependent on gender and the size of the lesion. In women, current practice recommends resection of HCAs when >5 cm, symptomatic, or with >20% growth rate on surveillance scans. For women with lesions under 5 cm or in those who reject surgery, surveillance with MRI is acceptable. Of note, in women using an OCP, it may be appropriate to stop the estrogen-containing compound and observe for the decrease in lesion size as regression after removal of risk factor has been observed.[1,12,13] For men, resection of all HCAs is recommended regardless of size because the risk of malignant transformation of HCAs in men is up to 10 times greater than in women.[9,14] The hemorrhagic risk associated with HCAs is believed to primarily depend on the size of the largest lesion rather than the overall number of lesions present.[15] In those presenting with hemorrhage, management options consist of supportive treatment, emergency resection, or TAE. Treatment choice depends on several factors including hemodynamic stability, services available, and clinician preference. TAE is often preferred because it allows for acute management of the hemorrhage while avoiding the higher blood loss and complication rate associated with emergency resection in comparison with a later elective resection.[5,9,16–18]

DISCLOSURES

Author contributions: T. Nugent wrote the article and is the article guarantor. N. Donlon revised the article. M. Kelly, M. Iqbal, N. Murphy, M. Ryan, and D. Maguire edited the article.

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