CASE REPORT

Post liver transplant presentation of needle-track metastasis of hepatocellular carcinoma following percutaneous liver biopsy

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SUMMARY

Hepatocellular carcinoma (HCC) is one of the few malignant tumours often treated without prior histological confirmation (in the patient with cirrhosis). Contrast-enhanced cross-sectional imaging is frequently diagnostic of HCC with a high degree of accuracy. However, on occasion, a liver biopsy is required, a complication of which can be needle-track metastasis. We present the case of a 57-year-old man who had previously undergone a liver transplant; he was found to have abdominal wall metastasis at the site of a prior percutaneous biopsy. This is the second case until now date of needle-track metastasis that presented following liver transplantation.

BACKGROUND

Hepatocellular carcinoma (HCC), in the context of liver cirrhosis, is one of the few malignant tumours where histological confirmation is not always warranted prior to definitive treatment. Current guidelines support the non-invasive diagnosis of HCC in the patient with cirrhosis for lesions >10 mm with typical findings on imaging.^{1–3} Needle-track seeding is a known complication of percutaneous tumour biopsy. We present the second reported case until now of needle-track metastasis presenting after liver transplantation.

CASE PRESENTATION

We present the case of a 57-year-old man with a background of orthotopic liver transplantation for HCC secondary to hepatitis C cirrhosis. The patient initially presented to an outside hospital in May 2009 with vague upper abdominal pain. Ultrasound revealed a 5 cm mass in the left lateral lobe of his liver. CT and MRI were deemed diagnostically indeterminate; however, both were significant for signs of portal hypertension and cirrhosis. α -Fetoprotein (AFP) and PIVKA-II (Proteins Induced by Vitamin K Absence/Anatagonism-II) were within normal limits at 4 (<11 ng/mL) and <2 ng/mL, respectively. The patient was anti-hepatitis C virus (HCV) positive with a viral load of 413 000 IU. A CT-guided liver biopsy (18 G needle, two cores obtained) was performed and was notable for the presence of well-differentiated HCC.

The patient presented to our institution for definitive treatment. He was not a suitable candidate for tumor resection given his preexistent comorbidities, including portal hypertension and thrombocytopenia (platelet count of 54 000/mm³)

and he was listed for a liver transplantation. Pre-embolisation imaging revealed a 4.8 cm hypervascular lesion consistent with HCC (figure 1). The patient underwent transarterial chemoembolisation (cisplatin/doxorubicin) of his tumour in September 2009 as a bridge to transplant. He was listed for a liver transplant with a Model for End-Stage Liver Disease (MELD) score of 22 (with exceptional points). The patient had an uneventful liver transplant in February 2010, and histological examination of the explanted liver demonstrated cirrhosis and chronic hepatitis. There was no evidence of a viable tumour in the chemoembolisation bed. Post-transplant immunosuppressive treatment consisted of induction with basiliximab, a steroid taper, tacrolimus and mycophenolate mofetil. The patient had an uncomplicated postoperative course following his transplant.

Two years post-transplant, he presented to our clinic with an abdominal wall mass. Physical examination revealed a palpable, hard, golf-ball-sized mass in the right upper quadrant. Contrast-enhanced CT demonstrated a 4 cm lobulated hypervascular mass in the anterior right rectus muscle (figure 2). There was no evidence of recurrent disease elsewhere, and the patient was taken to the operating room where the tumour and needle track were excised. Pathology confirmed the presence of HCC in the excised mass and needle track (figure 3). Following discussion with our oncology colleagues, it was decided to assign the patient to three-monthly surveillance imaging. Follow-up imaging 3 months later was notable for a new 1.6 cm hypervascular focus in the right rectus muscle. The patient was again taken to the operating room and had the mass excised, and histological analysis again confirmed the presence of HCC.

Figure 1 Axial contrast-enhanced CT of the liver showing a heterogeneously hypervascular left lateral segment mass (red arrows) in the arterial (A) and portal venous phases (B).

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Figure 2 Axial contrast-enhanced CT showing the enhancing right rectus muscle mass (red arrow), consistent with recurrent disease.

INVESTIGATIONS

- ▶ Ultrasound: 5 cm mass in the left lateral lobe of his liver.
- ▶ CT: 4 cm lobulated hypervascular mass in the anterior right rectus muscle.
- ▶ AFP and PIVKAA: within normal limits.
- ▶ Anti-HCV+ with a viral load of 413 000 IU.
- ▶ A CT-guided liver biopsy: well-differentiated HCC.

TREATMENT

Operative exploration and removal of the rectus mass which was confirmed to be HCC.

OUTCOME AND FOLLOW-UP

The patient is currently well with no evidence of disseminated disease.

DISCUSSION

This case illustrates the unfortunate complication of needle-track seeding after percutaneous biopsy to confirm the diagnosis of HCC in a patient with cirrhosis. This is the second case until now in the literature in which the patient presented with needle-track metastasis after liver transplantation.

Figure 3 H&E stain of the excised needle track showing evidence of hepatocellular carcinoma.

The incidence of needle-track seeding with HCC is likely to be underestimated. A study based on a multicentre questionnaire reported the risk to be in the order of 0.006% for abdominal malignancies.⁴ Recent and comprehensive studies report a risk of between 2% and 2.66%,^{5 6} including a review by Perkins⁷ which reported a 2.29% (0–11%) risk of seeding for percutaneous biopsy of HCC. The true incidence of this problem is most likely higher; many instances of seeding may not be correctly identified in the context of diffuse metastatic disease. Furthermore, with the increasing use of percutaneous ablative techniques, this problem is probably more widespread. There is one other case report of needle-track recurrence after liver transplantation in the literature.⁸ On an equally concerning note, Saborido *et al*⁹ reported that preoperative fine-needle aspiration biopsy was associated with extrahepatic recurrence of disease, their hypothesis being that biopsy mobilises tumour cells into the systemic circulation. The diagnosis of HCC can be made based on cross-sectional imaging in the majority of cases. This is reflected in the most recent edition of the American Association for the Study of Liver Diseases (AASLD) practice guidelines on the management of HCC.³ The findings of HCC on dynamic contrast-enhanced imaging include arterial enhancement, with washout in the portal venous and delayed phases of the scan.¹⁰ Sangiovanni *et al*¹¹ demonstrated that specificity (lesions >1 cm) was absolute for contrast-enhanced imaging whenever nodules show the typical vascular pattern described above. It is important to note that strict adherence to the appropriate imaging protocol is key to achieving such high specificity. The sole reliance on imaging for the diagnosis of HCC has been criticised by some who cite a false-positive rate of up to 30%, resulting in the misallocation of organs for transplantation.¹² These somewhat alarming rates of false-positive biopsies relate to small lesions and many of the studies did not adhere to the strict criteria for the radiological diagnosis of HCC in cirrhosis.

This case highlights the risks associated with percutaneous needle biopsy in cases of suspected HCC in patients who may require liver transplantation. This patient should have had an excellent prognosis based on his explant histology. Needle-track seeding does not seem to have an adverse effect on survival in the immunocompetent patient¹³; however, it is not unreasonable to assume that the outcome may not be so favourable in the post-transplant patient on immunosuppression.

We recommend that all available imaging modalities should be exhausted prior to performing percutaneous biopsy in patients with cirrhosis with suspected HCC prior to transplantation. Some have suggested that a percutaneous ablative treatment should be performed at the time of biopsy to reduce the risk of needle-track seeding.¹⁴ Stigliano *et al*¹⁴ reported that the rates of needle-track metastasis for diagnostic biopsy, percutaneous ethanol injection and radiofrequency ablation were 3.17%, 1.4% and 1.73%, respectively, showing a protective effect from ablative therapy.

There is a limited role for percutaneous biopsy in the workup of liver nodules, but its use should be highly selective. Lesions >2 cm with typical findings on imaging should be treated as HCC without histological confirmation. Patients with small nodules (<2 cm) without characteristic imaging findings may be observed safely for 3 months and reimaged. Many will achieve the criteria for HCC in this interval, obviating the need for biopsy. The short delay in diagnosis does not result in a poorer outcome.¹⁵ Biopsy of liver nodules in patients with cirrhosis should be limited to patients in whom the result would lead to an improvement in survival.

Learning points

- Needle-track metastasis is a possible complication of a liver biopsy for hepatocellular carcinoma (HCC).
- Lesions >2 cm with typical findings on imaging should be treated as HCC without histological confirmation.
- Patients with small nodules (<2 cm) without characteristic imaging findings may be observed safely for 3 months and then reimaged.
- Many will achieve the criteria for HCC over this period, obviating the need for biopsy.
- The short delay in diagnosis does not result in a poorer outcome.¹⁵

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Competing interests None.

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