Port site metastases following laparoscopic liver resection for hepatocellular carcinoma

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ABSTRACT

A laparoscopic approach is being used increasingly in specialist centres for the resection of hepatocellular carcinomas and compares favourably with the traditional open approach, in terms of perioperative morbidity and mortality as well as long-term survival. We present a case of port site recurrence in a patient who underwent a laparoscopic left lateral segmentectomy for a hepatocellular carcinoma diagnosed during investigation of symptomatic gallstones. Nearly three years following surgery, surveillance computed tomography demonstrated a suspicious lesion at the site of one of the laparoscopic ports. Further resection was carried out and the lesion was confirmed histologically to be an isolated recurrence of the primary hepatocellular carcinoma, involving peritoneum and abdominal wall. This case demonstrates that it is possible to encounter port site metastasis following laparoscopic resection of primary liver tumours although the incidence is very rare.

KEYWORDS

Hepatocellular carcinoma – Laparoscopic liver resection – Metastases

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Over the last decade, laparoscopic liver resection has become broadly accepted as an alternative to open surgery in appropriately selected patients. The 2008 Louisville consensus statement on laparoscopic liver surgery concluded that small hepatocellular carcinomas (HCCs), either in the context of a normal background liver or compensated cirrhosis, could be safely resected laparoscopically provided that this was undertaken in experienced centres.¹

In 2012 Xiong *et al* published a meta-analysis of nine studies that compared outcomes in patients undergoing either laparoscopic ($n=234$) or open ($n=316$) liver resection for HCC.² The authors found that laparoscopic liver resection was associated with less intraoperative blood loss and a reduced incidence of postoperative liver failure but had no impact on either margin positivity rates or tumour recurrence.

To our knowledge, there are no published reports of isolated port site recurrence following laparoscopic liver resection for hepatocellular cancer. In this paper, we report one such case occurring nearly three years following liver resection.

Case History

We present the case of a 68-year-old woman who, while being investigated for symptomatic gallstone disease, was found on ultrasonography to have a mass lesion in the left lateral aspect of the liver. Subsequent triple phase computed tomography (CT) and liver protocol magnetic

resonance imaging confirmed the lesion to have characteristic features of HCC.

The patient's past medical history included hyperthyroidism, type 2 diabetes mellitus, hypertension and cerebrovascular disease. She had also received a recent diagnosis of a ductal carcinoma of the left breast and a decision was therefore made to proceed with a laparoscopic cholecystectomy with biopsy of the liver lesion in the first instance. This confirmed the presence of a well differentiated HCC and so she underwent a laparoscopic left lateral liver resection a few weeks later, without complication. The specimen was retrieved in an Endo Catch bag (Covidien, Dublin, Ireland). Histology confirmed the presence of a 45mm Edmondson grade 2 HCC over 3cm from the closest surgical resection margin. The breast cancer was treated subsequently with wide local excision and external beam radiotherapy.

Follow-up for the first two years consisted of serial clinical examinations, alpha-fetoprotein measurement and CT at six-monthly intervals. As the patient remained well with no evidence of disease, the imaging interval was increased to annual surveillance. However, CT performed 32 months after surgery demonstrated a new nodule at an epigastric port site that was not palpable on clinical examination. There was no other evidence of disseminated disease and the patient therefore underwent local excision of this area. Histological examination confirmed the presence of two nodules of moderately differentiated metastatic HCC. As this was the only site of recurrence, the multidisciplinary

Figure 1 Preoperative computed tomography demonstrating a hypervascular lesion in the abdominal wall (arrow)

team decision was to treat this area with external beam radiotherapy.

Discussion

HCC is the fifth most common malignancy worldwide, representing 5.6% of all cancers, and it is the third most common cause of cancer related mortality.³ These tumours (70–90%) develop primarily in the context of pre-existing chronic liver disease. The aetiology of this varies geographically, with chronic hepatitis B virus infection accounting for the majority of cases in East Asia and sub-Saharan Africa whereas alcohol use, hepatitis C virus infection and non-alcoholic fatty liver disease are the main risk factors in Europe and North America.

Treatment for HCC is determined by stage of the disease as well as the remnant hepatic function. Current guidelines on management recommend surgical resection as the first-line treatment in those individuals with solitary tumours and preserved liver function.⁴ Where appropriate expertise exists, these resections can be performed just as safely using a laparoscopic approach with oncological outcomes that are comparable with conventional open surgery.²

While port site recurrence following laparoscopic resection of HCC has not been described previously in the literature, it has always been a theoretical possibility. A variety of mechanisms through which port sites may become contaminated with tumour cells during surgery have been postulated including cell spillage (eg opening of tumour, the presence of malignant ascites), direct wound contamination (eg specimen removal without a retrieval bag, trocar contamination) and tumour aerosolisation during dissection.⁵ In the case reported here, we were unable to identify how tumour cells came into contact with the port site at the time of liver resection. The tumour was over 3cm from the closest surgical margin and was not opened at any time during the

Figure 2 Resected specimen demonstrating nodule of metastatic hepatocellular carcinoma in the abdominal wall

operation. The only point at which the tumour was breached was during the original laparoscopic biopsy although the biopsy needle was inserted through the abdominal wall using a protective sheath.

Conclusions

This case highlights the potential for port site recurrence following laparoscopic resection of HCC although the incidence of this is clearly low. Meticulous attention to surgical technique should (in the majority of cases) prevent tumour implantation in the abdominal wall. The healing abdominal wall is an environment rich in growth factors that could serve as a niche for circulating tumour cells to embed here. New nodularity in port sites either clinically or on radiological imaging should raise the possibility of tumour recurrence and be investigated appropriately.

References

1. Cannon RM, Brock GN, Marvin MR, Buell JF. Laparoscopic liver resection: an examination of our first 300 patients. *J Am Coll Surg* 2011; **213**: 501–507.
2. Xiong JJ, Altaf K, Javed MA *et al*. Meta-analysis of laparoscopic vs open liver resection for hepatocellular carcinoma. *World J Gastroenterol* 2012; **18**: 6,657–6,668.
3. El-Serag HB. Hepatocellular carcinoma. *N Engl J Med* 2011; **365**: 1,118–1,127.
4. EASL–EORTC clinical practice guidelines: management of hepatocellular carcinoma. *J Hepatol* 2012; **56**: 908–943.
5. Lee BR, Tan BJ, Smith AD. Laparoscopic port site metastases: incidence, risk factors, and potential preventive measures. *Urology* 2005; **65**: 639–644.