DOI:10.1111/hpb.12123 HPB

ORIGINAL ARTICLE

Repeat liver resection after a hepatic or extended hepatic trisectionectomy for colorectal liver metastasis

Oliver Ziff, Ibrahim Rajput, Robert Adair, Giles J. Toogood, K. Rajendra Prasad & J. Peter A. Lodge

HPB and Transplant Unit, St. James's University Hospital, Leeds, UK

Abstract

Objective: A right and left hepatic trisectionectomy and an extended trisectionectomy are the largest liver resections performed for malignancy. This report analyses a series of 23 patients who had at least one repeat resection after a hepatic trisectionectomy for colorectal liver metastasis (CRLM).

Methods: A retrospective analysis of a single-centre prospective liver resection database from May 1996 to April 2009 was used for patient identification. Full notes, radiology and patient reviews were analysed for a variety of factors with respect to survival.

Results: Twenty-three patients underwent up to 3 repeat hepatic resections after 20 right and 3 left hepatic trisectionectomies. In 18 patients the initial surgery was an extended trisectionectomy. Overall 1-, 3- and 5-year survival rates after a repeat resection were 100%, 46% and 32%, respectively. No factors predictive for survival were identified.

Conclusion: A repeat resection after a hepatic trisectionectomy for CRLM can offer extended survival and should be considered where appropriate.

Keywords

trisectionectomy, repeat resection, hepatectomy, colorectal liver metastases, extended trisectionectomy, metastasectomy

Received 6 November 2012; accepted 21 February 2013

Correspondence

J. Peter A. Lodge, HPB and Transplant Unit, St. James's University Hospital, Leeds LS 9 7TF, UK. Tel: 440 113 2064890. Fax: +440 113 2448182. E-mail: peter.lodge@leedsth.nhs.uk

Introduction

A hepatic trisectionectomy entails a large liver resection involving removal of up to 80% of the liver parenchyma.[1–6] These procedures are used in highly specialized units primarily for the treatment of extensive and advanced hepatic or biliary disease. A hepatic trisectionectomy remains the most challenging of the major anatomic hepatectomies with higher complication rates than other hepatic resections.[4,5] There have been few published series with these procedures and long-term follow-up has rarely been considered.[4,5,7–12] Recently reported experience with a right and left hepatic trisectionectomy, and described extensions of these operations, regarded as extended trisectionectomy, have been analysed in an attempt to define the current role for these challenging operations.[4,5,9]

This manuscript was presented at the 10th World IHPBA Congress, Paris, 1–5 July 2012.

For hepatic colorectal metastases (CRLM), a liver resection has greatly improved survival rates, with 5-year survival reported to be 30% to 60%.[13–16] However, after the initial liver resection, recurrence occurs in up to 75% of patients and in 20–40% of these patients, the liver is the only site of recurrence.[16–20] At present there are no clear practice guidelines for the management of recurrent hepatic metastasis. A repeat liver resection is increasing in popularity, but there are few long-term studies assessing the outcome. Further, most of the available data relates to patients who have undergone only a minor liver resection initially.[13,15,18,19,21–23]

After an extensive hepatic resection, recurrence is more likely owing to the aggressive nature of the initial disease.[24] As there is a significantly reduced liver volume after the initial resection, although liver regeneration occurs, important anatomy is altered. Thus, a repeat liver resection after a hepatic trisectionectomy is more challenging. This study reports a cohort of patients who underwent a trisectionectomy or an extended trisectionectomy and had a repeat hepatectomy with the aim of describing the

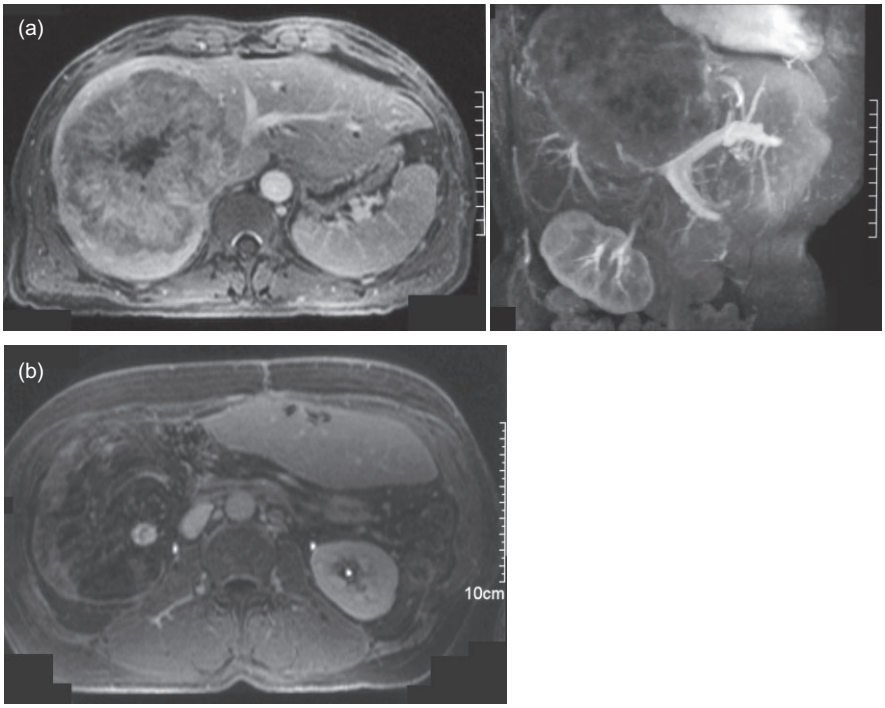

Figure 1 A 53-year-old male who had resection of a T1 N0 sigmoid colon cancer in 1993 presented with deranged liver function tests (LFTs). A cross-section and a coronal oblique magnetic resonance scan (MRI) scan (Fig. 1a) in July 2000 demonstrated a large liver metastasis obliterating the right lobe and invading the left lobe. The tumour surrounded much of the inferior vena cava (IVC), with obliteration of the right and middle hepatic veins and it was in close apposition to the left portal triad structures. A surgical resection was by a right hepatic trisectionectomy, caudate lobectomy (peeling the tumour off the IVC and left hepatic vein), with bile duct excision and a hepaticojejunostomy. Histopathology of the 2.0-kg resection specimen showed a 14-cm-diameter tumour comprised of moderately differentiated adenocarcinoma consistent with colorectal origin, with a clear resection margin of 0.5 mm. The patient made an uncomplicated recovery, with discharge on day 8. He received adjuvant chemotherapy with 5-Fluorouracil (5-FU) for 6 months. In June 2001, a routine follow-up computed tomography (CT) scan detected further liver metastases and MRI showed three tumours in the liver remnant (Fig. 1b). It was possible to remove these tumours by metastasectomy – anterior segment 2, anterior segment 3, posterior segment 3. Histopathology demonstrated the tumours to be 3.3, 2.7 and 2.0 cm in diameter and composed of moderately differentiated adenocarcinoma, with vascular invasion into portal vein branches. A tumour was seen microscopically at the resection margins in two of the three specimens (R1). No further chemotherapy was offered by his local oncology team. Follow-up was routine until May 2006 when a CT scan showed an 8-mm pulmonary metastasis, which was resected with a clear margin, confirmed to be metastatic adenocarcinoma. No chemotherapy was offered at this stage. Further follow to January 2013 up has been uneventful

clinical course and surgical techniques used in selected patients in order to illustrate the difficulties with this patient population.

Patients and methods

A retrospective analysis of a prospective database was undertaken. The study period was from May 1996 and April 2009. During this period, a total of 427 patients underwent right and left hepatic trisectionectomies for a variety of aetiologies. Twenty-three (5.3%) patients with CRLM subsequently underwent a further liver resection and were included in this study. The technique for a trisectionectomy and an extended trisectionectomy has previously been described.[4,5,9] Portal vein embolization was not routinely used. Future liver remnant function was assessed as previously described.[25] After recurrence of a tumour, patients were assessed prior to resection with a computed Tomography (CT) of the thorax, abdomen and pelvis to exclude extrahepatic disease. More recently, positron emission tomography (PET) CT has been used to assess any suspicious extrahepatic lesions that were not fully characterized by CT alone. Patients were only subjected to re-resection if extrahepatic disease was felt to be resectable (most often lung metastases). All patients underwent magnetic resonance imaging (MRI) of the liver to delineate the anatomy clearly and to characterize the tumour. It has been the unit policy never to biopsy malignant liver lesions when considering surgery because of the fear of tumour seeding. All resections were performed using a Cavi-Pulse Ultrasonic Surgical Aspirator (CUSA, Model 200T; Valley Lab., Boulder, CO, USA), with a Pringle manoeuvre (portal