Reminder of important clinical lesson

Partial nephrectomy and enbloc liver resection using a bipolar radiofrequency device for renal cell carcinoma invading the liver

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Summary

A 66-year-old man presented with right-sided abdominal pain. Ultrasound, CT and MRI scans showed a right renal mass arising from the upper pole with direct involvement of the right lobe of the liver. Biopsy confirmed renal cell carcinoma. After Multi Disciplinary Team (MDT) discussion, right partial nephrectomy with enbloc resection of segments VI and VII of the liver was performed with the help of intraoperative ultrasound scan and the Habib 4X bipolar radiofrequency device. Apart from symptomatic collection, which was drained radiologically, the patient made a good recovery. The patient developed recurrence at the resection margin but is in remission following chemotherapy at 12 months.

BACKGROUND

Direct liver involvement in renal cell carcinoma (RCC), although uncommon, is a dismal prognostic sign. However, aggressive surgical treatment improves survival. In this case we achieved enbloc resection without sacrificing the right kidney by using the bipolar radiofrequency device and performed nephron sparing surgery.

CASE PRESENTATION

The patient presented to his general practitioner with right upper quadrant pain. There was no significant past medical or family history.

INVESTIGATIONS

The patient had an ultrasound scan, which showed a mass arising from the upper pole of the right kidney. A subsequent CT scan (figure 1A) showed a mass arising from the upper pole of the kidney with direct involvement of liver segments VI and VII. CT-guided biopsy confirmed RCC. MRI scan (figure 1B) showed no other organ involvement. A Dimercapto Succinic Acid (DMSA) scan showed a normally functioning left kidney.

DIFFERENTIAL DIAGNOSIS

The case was discussed at MDT and enbloc resection was planned.

TREATMENT

Using a standard liver resection incision the liver was mobilised. After opening the Gerota's fascia the right kidney was mobilised. Intraoperative ultrasound scan was performed. As the tumour was confined to the upper pole of the right kidney, a partial nephrectomy was performed enbloc with the segments VI and VII of the liver using the Habib 4X radiofrequency device (AngioDynamics Inc, New York, USA) (figures 2A, B). The patient made an uneventful recovery and was discharged home on day 5. On day 12 the patient was readmitted with a symptomatic collection, which was drained radiologically.

OUTCOME AND FOLLOW-UP

A recurrence at the resection margin developed within 7 months of surgery. The patient was referred to the oncologist and with chemotherapy the tumour regressed. The most recent CT scan showed no evidence of recurrence at 1-year follow-up. The patient remains well.

Figure 1 (A) MRI and (B) CT scans showing renal mass invading the liver.

DISCUSSION

RCC involves adjacent organs in 10% of cases. Five-year survival rate is less than 5% with a high risk of disease recurrence with rates ranging from 50–85% depending on tumour state and lymph node involvement.¹ Despite advances in adjuvant systemic treatments for RCC, surgical resection continues to be the best option for improved long-term survival in selected patients with RCC and liver involvement by contiguity.^{2–3} Johnin K *et al* reported two patients with renal tumour invading the liver who had radical nephrectomy and liver resection and showed no evidence of disease at 100 and 57 months after resection.⁴ One

patient with locally invasive RCC required resection of the kidney, adrenal glands, liver, diaphragm and lung, with diaphragmatic reconstruction. The patient was alive and well at 5 years.⁵ Karellas *et al* reported improved survival with extended resection.⁵ Applying bipolar radiofrequency energy to an electrode array can enable transmural excision of renal parenchyma in a bloodless way (figure 2B) without incurring system injury⁶ and without renal pedicle clamping.⁷ Ablation results in complete cell destruction.⁸ Neoadjuvant strategies that integrate aggressive surgical intervention with systemic treatment may be a promising treatment paradigm.⁹

Figure 2 Intraoperative picture showing (A) Habib 4X bipolar resection device in use during partial nephrectomy and (B) bloodless resection margin post partial nephrectomy.

Learning points

- ▶ Aggressive surgical treatment improves survival in cases of RCC with direct liver invasion.
- ▶ Radiofrequency assisted resection technique helps to achieve nephron sparing renal surgery.

Competing interests None.

Patient consent Obtained.

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