

CASE REPORT

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Preoperative chemoembolization for unresectable hepatoblastoma

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Abstract Complete surgical resection offers the only chance for cure in patients with hepatoblastoma (HB). Patients with unresectable lesions are given preoperative chemotherapy in an attempt to create a resectable lesion. We present a case of an 11-month-old with an unresectable stage III HB unresponsive to systemic chemotherapy. Transfemoral hepatic-artery chemoembolization resulted in a surgically resectable tumor. The patient underwent a right trisegmentectomy with complete resection of the tumor and remains tumor-free 24 months postoperatively. Salvage chemoembolization can be an effective preoperative modality to convert an unresectable tumor into a resectable one.

Keywords Hepatoblastoma · Chemoembolization

Introduction

Hepatoblastoma (HB) is the most common malignancy of the liver in children, with complete surgical resection offering the only chance for cure [1, 2]. Up to 50% of patients have surgically unresectable lesions at the time of presentation [3, 4]. Patients with unresectable HB are treated with preoperative chemotherapy in an attempt to

create a resectable lesion. We report a case of a male infant with an unresectable stage III HB treated with preoperative hepatic-artery chemoembolization.

Case report

An 11-month-old 10.6-kg male was diagnosed with stage III HB after presenting with a right upper-quadrant mass. The initial alpha-fetoprotein (AFP) level was 14,449 µg/l. Magnetic resonance imaging (MRI) revealed an 8 × 12-cm centrally-located tumor involving a large portion of the right lobe and the medial portion of the left lobe of the liver. Segments two and three were spared of tumor on MRI. Computed tomography (CT) with intravenous contrast showed tumor encasing the left portal vein (Fig. 1). Following an operative staging liver biopsy, which confirmed the preoperative imaging studies, the patient received six cycles of chemotherapy with 5-fluorouracil (170 mg), vincristine (0.4 mg), and cisplatin (3.3 mg/kg). Four months after presentation, a second MRI scan revealed a minimal reduction in tumor size. The AFP level at this time had decreased to 114 µg/l. The patient then received two cycles of transfemoral chemoembolization with cisplatin (30 mg) and adriamycin (3 mg) in a lipiodol emulsion followed by gelfoam via a replaced left hepatic artery and a replaced right hepatic artery (Fig. 2). The AFP level dropped to 3.4 µg/l post-chemoembolization. Subsequently, a single course of systemic ifosfamide (2,100 mg/m²), carboplatin (400 mg/m²), and etoposide (150 mg/m²) was administered. This resulted in tumor regression to 5 × 7 cm. A CT portogram revealed a widely patent portal vein of smooth caliber, suggesting the vessel was not encased with tumor (Fig. 3).

At 17 months of age, complete tumor resection was performed via a right trisegmentectomy with total vascular occlusion. The patient had 20 ml/kg blood loss, requiring 13 ml/kg blood intraoperatively. Final pathology revealed a 10 cm × 11 cm × 6 cm specimen containing necrotic tumor with no viable epithelial tumor identified. The postoperative course was uncomplicated. The patient was discharged on the 5th postoperative day. Two additional cycles of systemic ifosfamide (2,100 mg/m²), carboplatin (400 mg/m²), and etoposide (150 mg/m²) were administered at 1 and 2 months postoperatively. The patient remains tumor-free 24 months post-operatively.

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Discussion

Surgical resection remains the primary curative modality for patients with HB. Without complete tumor resection, the prognosis of these patients remains poor [1, 2].



Fig. 1 Pre-chemotherapy CT scan with IV contrast demonstrating large tumor involving majority of right lobe and medial segments of left lobe. *Arrow* indicates left portal vein encased by tumor

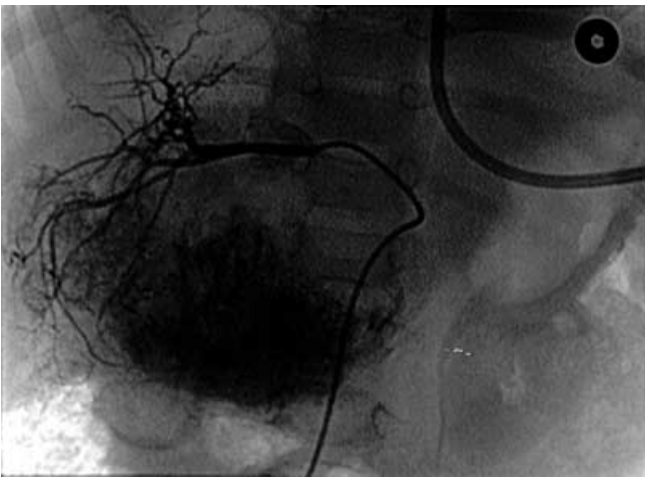


Fig. 2 Pre-chemoembolization angiogram via replaced right hepatic artery

Systemic chemotherapy has been administered preoperatively to reduce tumor size. Unresectable lesions can be converted to surgically resectable tumors with the use of systemic chemotherapy [3, 5–7]. Despite preoperative chemotherapy, however, some tumors remain unresectable.

Preoperative hepatic-artery chemotherapy (HAC) has been used to convert an unresectable HB to a resectable lesion [8–11]. Golladay et al. [8] described a patient with a tumor unresponsive to systemic chemotherapy. After receiving HAC, the mass was resected via a left trisegmentectomy and histologically revealed minimal viable tumor. They concluded that the use of selective preoperative HAC is warranted in patients whose tumor does not respond to systemic chemotherapy. Yokomori et al.



Fig. 3 Post-chemoembolization CT scan demonstrating marked reduction in tumor size and tumor-free lateral segment of left lobe. *Arrow* indicates widely patent left portal vein

described a case of a 4-month-old with a histologically-proven unresectable HB that was treated with HAC without operative resection [12]. The patient remained tumor-free 6 years post-therapy at the time of publication. Subsequently, transcatheter arterial chemoembolization (TACE) was reported in eight children with HB. The average tumor shrinkage was 25.8%. Complete tumor resection was achieved in each case. The authors concluded that TACE was not only an effective preoperative therapeutic modality for an unresectable HB, but could also be used for resectable lesions [13].

The present case lends support for TACE for unresectable HB. The tumor did not show any significant regression in size after systemic chemotherapy. Although the AFP decreased, indicating a tumor response, it plateaued, not returning to a normal level until TACE had been performed. Two cycles of chemoembolization resulted in 65% tumor regression, allowing the patient to undergo a curative resection. Adriamycin was used via TACE rather than systemically in the hope that better results would be obtained with local therapy. A CT portogram demonstrated good portal flow, thus nullifying the risk of ischemia to the normal liver parenchyma. A post-embolization CT scan was obtained to demonstrate any areas of off-target embolization resulting in ischemia or necrosis. The final pathology revealed no viable tumor cells. Preoperative hepatic-artery chemoembolization can thus be an effective therapy to reduce tumor size prior to resection in a patient with an unresectable HB.

References

1. Exelby P, Filler RM, Grosfeld JL (1974) Liver tumors in children in particular reference to HB and hepatocellular carcinoma: American Academy of Pediatrics Surgical Section survey. *J Pediatr Surg* 20: 329–331

2. Randolph JG, Altman RP, Arensman RM, et al (1978) Liver resection in children with hepatic neoplasms. *Ann Surg* 187: 599–605
3. Gauthier F, Valayer J, LeTahai B, et al (1986) Hepatoblastoma and hepatocarcinoma in children: analysis of a series of 29 cases. *J Pediatr Surg* 21: 424–429
4. Giacomantonio M, Ein SH, Mancer K, et al (1984) Thirty years of experience with pediatric primary malignant liver tumors. *J Pediatr Surg* 19: 523–526
5. King DR, Ortega J, Campbell J, et al (1991) The surgical management of children with incompletely resected hepatic cancer is facilitated by intensive chemotherapy. *J Pediatr Surg* 26: 1074–1081
6. Reynolds M, Douglass EC, Finegold M, et al (1992) Chemotherapy can convert unresectable HB. *J Pediatr Surg* 27: 1080–1084
7. Seo T, Ando H, Watanabe Y, et al (1998) Treatment of HB: less extensive hepatectomy after effective preoperative chemotherapy with cisplatin and adriamycin. *Surgery* 123: 407–414
8. Golladay ES, Mollitt DL, Osteen PK, et al (1985) Conversion to resectability by intra-arterial infusion chemotherapy after failure of systemic chemotherapy. *J Pediatr Surg* 20: 715–717
9. Tsuchida Y, Bastos JC, Honna T, et al (1990) Treatment of disseminated HB involving bilateral lobes. *J Pediatr Surg* 25: 1253–1255
10. Ogita S, Tokiwa K, Taniguchi H, et al (1987) Intraarterial chemotherapy with lipid contrast medium for hepatic malignancies in infants. *Cancer* 60: 2886–2890
11. Takayama T, Makuuchi M, Takayasu K, et al (1990) Resection after intraarterial chemotherapy of a HB originating in the caudate lobe. *Surg* 107: 231–235
12. Yokomori K, Hori T, Asoh S, et al (1991) Complete disappearance of unresectable HB by continuous infusion therapy through hepatic artery. *J Pediatr Surg* 26: 844–846
13. Oue T, Fukuzawa M, Kusafuka T, et al (1998) Transcatheter arterial chemoembolization in the treatment of HB. *J Pediatr Surg* 33: 1771–1775