Case Report

Hepatoblastoma in a 14-months old child

Rashes Shrestha, Niraj Bhattarai, Binay Thakur, Mukti Devkota, Rajesh Kumar Mandal, Purushottam Adhikari
Thoracic Surgery Unit, Dept of surgical oncology, BP Koirala Memorial Cancer Hospital

ABSTRACT

In children, commonest liver tumor is hepatoblastoma. We present a 14-month-old male child who presented with abdominal distension and loose stool. Radiological imaging revealed solid hepatic mass. Hematological investigations revealed anemia, thrombocytosis and high Serum alpha fetoprotein (AFP) level. Ultrasound (USG) guided FNAC confirmed the mass to be hepatoblastoma. CT scan revealed hepatoblastoma PRETEXT stage III. The patient underwent 6 cycles of neoadjuvant chemotherapy and responded to POSTTEXT stage II. Left hemi-hepatectomy was done with clear resectin margins. Complete surgical excision of the mass after preoperative chemotherapy remains the mainstay of the treatment of locally advanced hepatoblastoma.

Keywords: chemotherapy, hepatoblastoma, liver resection.

Introduction

Hepatoblastoma contributes about 2/3rd of all malignant liver tumors. In pediatrics population 90% of hepatoblastoma are seen before 5 years.[1] Among all the cases, hepatoblastoma accounts for 1-4% of all primary malignancy in children.[2] With the introduction of chemotherapy survival rates has increased to 70-80% from 30% in the past.[3] Incidence of hepatoblastoma has gradually been increasing from past three decades.[4]

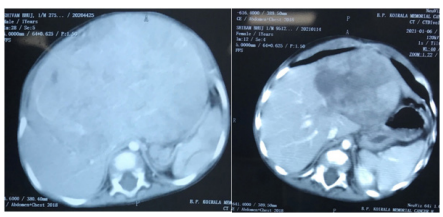
Diagnosis of hepatoblastoma is primarily made with elevated levels of AFP which also helps in monitoring treatment response and follow-up. It is mostly sporadic but related with genetic abnormalities such as familial adenomatous polyposis and Beckwith-Weidmann syndrome.[5] Low birth weight below 1 kg are at greater risk of developing hepatoblastoma. Here, we report a case of locally advanced hepatoblastoma which was managed successfully with multimodality treatment.

Case Report

A 14 months old male patient presented with chief complains of abdominal distension, fever on and off and weight loss for 3 months. He had loose stool for 1 week. On general examination, patient was malnourished but attended milestone as per age. The weight and height were 7.5 kg and 72 cm, respectively. On abdominal examination, hepatomegaly was found. Hematological investigation showed anemia (Hemoglobin-6.6gm/ dl), thrombocytosis (Platelet -1824000/ mm3), leukocytosis (WBC - 19,200/ mm^3). There was elevated LDH (748U/ L) and high AFP (>1000 ng/ ml). He was negative for Hepatitis B and C.

USG showed 11x10 cm heteroechoic mass with internal vascularity in left lobe of liver. Further, CT revealed circumscribed large heterogeneously enhancing mass involving segment 1, 2, 3, 4, 5 and 8 measuring 11x10x9 cm^3, encasing left hepatic vein, left middle hepatic vein, intrahepatic left portal vein and left hepatic artery. Right portal vein was compressed by the mass. Mass effect was seen by compression and displacement of stomach, pancreatic head and superficial encasement of main portal vein (Fig. 1).

Fig. 1. Pre treatment CT.



Address of Correspondence: Dr Rashes Shrestha, Fellow, Thoracic Surgery Services, BP Koirala Memorial Cancer Hospital , E-mail: rashessth@gmail.com, Phone: +977-9855064577

Fig. 2. CT afer 6 NACT.

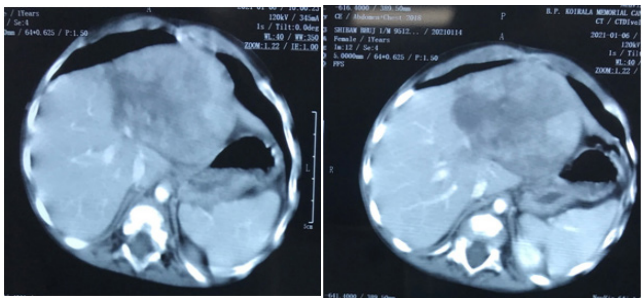
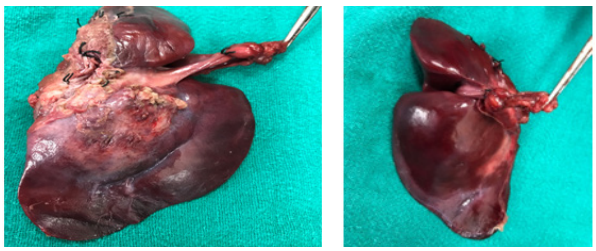


Fig. 3. Specimen.



USG guided FNAC of mass revealed round cell tumor, suggestive of hepatoblastoma. In a multidisciplinary meeting, case was staged as PRETEXT III.[6] Patient was considered for neoadjuvant chemotherapy (NACT) based on PLADO regimen (cisplatin and doxorubicin).[7] Patient was reassessed after 3 cycles of NACT, but the tumor was still unresectable. Patient received three more cycles of NACT (total – 6 cycles). After 6 cycles of NACT, CT findings (Fig. 2) showed tumor of 6.7x5.5 cm occupying segments 2, 3 and 4 with normal appearing right lobe (POSTTEXT II). AFP level was 5.08 ng/ ml. Patient underwent left hemihepatectomy. Operative findings showed tumor of 7x5x5 cm invading segments 2, 3 and 4 (Fig. 3). Right lobe of liver was normal. During surgery, inflow control with ligation of left portal vein, left hepatic artery and left hepatic duct was done. Parenchymal transection using Kelly-clamp method was done. Lastly, left hepatic vein and branches of middle hepatic veins to segment 4 were secured. Post-operatively, patient developed biliary leak in drain: 100-150 ml/ day. Patient was planned for re-exploration after final histopathology showed hepatoblastoma with clear resection margins. On re-exploration, on-table intraoperative cholangiogram was performed. It showed right anterior sectoral ductal injury which was arising aberrantly from left hepatic duct. Roux-en-Y hepaticojejunostomy was done. Patient recovered well and drain was taken out on 7th post-operative day and discharged on 8th post-operative day after second surgery.

Discussion

The most common primary liver malignancy in children below 5 years is hepatoblastoma.[8] Hepatoblastoma affects mainly right lobe of liver, unifocal in nature and metasizes to liver.[9] Biliary atresia and Hepatitis-B affected children are at increased risk.[10] Risk factor includes low birth weight and parental smoking.

The patients clinically present with either abdominal mass or distension, anorexia, anemia, weight loss, vomiting, jaundice and itchy skin based on size and extent of tumor metastasis.[11] Histologically, hepatoblastoma is divided into epithelial (56%) and mixed epithelial/ mesenchymal (44%).[12] Moreover, epithelial type is subdivided into fetal, embryonal, microtubular and small cell undifferentiated. Fetal pattern has better prognosis while small cell differentiated has worst prognosis.[13]

Raised AFP level, thrombocytosis and solid hepatic tumor in children below 5 years is diagnostic of hepatoblastoma.[14] Above, three criteria were fulfilled by our patient during initial investigation. For children AFP level < 50 ng/ml is normal. Initially, AFP levels are high at birth but falls to normal level at 2 years. Strong indicator for hepatoblastoma is AFP level > 500 ng/ ml. Moreover, AFP level is a good bio-marker for monitoring treatment and recurrence of disease. Massive tumor and/or metastasis and high AFP level is indicative of signifying poor prognosis.[15] Radiologically, the diagnostic modality is CT scan or MRI. USG abdomen shows a liver mass and hemorrhagic areas within the tumor. Typically, Malignant tumor diagnosis in contrast CT revels hypervascularity lesion in liver. Due to the risk of tumor dissemination high AFP level for less than 3 years child may not require biopsy for histological diagnosis.[16] Thrombocytosis is a typical feature of hepatoblastoma.

Our case was managed based on SIOPEL guidelines that is primarily based on preoperative chemotherapy followed by delayed surgery. Pretreatment extension (PRETEXT)[6] is based on radiological imaging and helps to identify tumor size, vessel invasion and distant metastasis. The

system identifies four PRETEXT stages (I-IV), which reflect the number of sections of the liver that are involved by the tumor and describes the extent of the disease beyond the liver using the following letters: "V" if the tumor extends into the vena cava and/or all three hepatic veins, "P" if the main and/or both left and right branches of the portal vein are involved by the tumor, "C" if there is involvement of the caudate lobe, "E" if there is evidence of extrahepatic intraabdominal disease and "M" if there are distant metastases. Our case was PRETEXT III (three liver sections were involved and One liver section was tumor free) on evaluation. Since after 3 NACT, adequate response could not be achieved, we decided to continue NACT for 6 Cycles. POSTTEXT II[6] (two sections - medial and lateral were involved and two adjoining sections – anterior and posterior were tumor free) was achieved after 6 cycles of NACT. It helped us to successfully perform left hemi-hepatectomy.

Post hepatectomy biliary leakage ranges are not an uncommon complication, ranging from 3.6% to 33%.[17] Various anomalies have to be kept in mind particularly abnormal origin of anterior sectoral duct from left hepatic duct. Koch et al. grading system of bile leakage are effective and may facilitate the evaluation of therapeutic strategies for biliary complications.[18] Our case was also complicated with unrecognized during primary surgery this particular anomaly which led to disconnected bile duct and persistence biliary leakage. A wait and watch policy were adopted in our case till the final pathology report became available in order to confirm R0 resection. Re-exploration with intraoperative cholangiography clearly identified the reason for biliary leakage and hepaticojejunostomy resolved the problem.

Conclusion

Excellent results have been achieved in the treatment of hepatoblastoma in recent years. Combination of radical tumor resection, chemotherapy and liver transplantation are option for management of hepatoblastoma. Even in advanced cases, neoadjuvant chemotherapy followed by resectional surgery helps in achieving R0 resection and avoiding the need for liver transplantation.

Reference

1. Mussa A, Ferrero GB, Ceoloni B, Basso E, Chiesa N, Crescenzo AD, et al: Wiedemann– Beckwith of phenotype severe with newborn a in hepatoblastoma Neonatal). Pediatr J Eur.2011;11-1407: 170
2. Mukhopadhyay P, Kundu SS, Banerjee A, Mukherjee A: Adult hepatoblastoma in a female Down's. J Assoc Physicians India. 2007; 55: 242 243.
3. Chopra A, Iyer VK, Agarwala S: Apoptotic protein expression, glycogen content, DNA ploidy and cell proliferation in hepatoblastoma subtyping and their role in prognostication. Pediatr Surg Int 2010; 26: 1173-1178.
4. Linabery AM, Ross JA. Trends in childhood cancer incidence in the US (1992-2004). Cancer 2008;112: 416-432.
5. Garber JE, Li FP, Kingston JE: Hepatoblastoma and familial adenomatous polyposis. J Natl Cancer Inst 1988; 80:1626-1628.
6. Roebuck DJ, Aronson D, Clapuyt P, Czauderna P, de Ville de Goyet J, Gauthier F, et al: International Childrhood Liver Tumor Strategy Group 2005 PRETEXT: A revised staging system for primary malignant liver tumors of childhood developed by the SIOPEL group. Pediatr Radiol 2007; 37:123-32.
7. Zsíros J, Maibach R, Shafford E, Brugieres L, Brock P, Czauderna P, et al: Successful treatment of childhood high-risk hepatoblastoma with dose-intensive multiagent chemotherapy and surgery: Final results of the SIOPEL-3HR study. J Clin Oncol 2010; 28:2584-90
8. Samuel N, Villani A, Fernandez CV, Malkin D: Management of familial cancer: Sequencing, surveillance and society. Nat Rev Clin Oncol 2014; 11:723.
9. Purcell R, Childs M, Maibach R, Miles C, Turner C, et al: HGF/c-Met related activation of β-catenin in hepatoblastoma. J Exp Clin Canc Res 2011; 30: 96.
10. Bosman FT, Carneiro F, Hruban RH, Theise ND: WHO classification of tumors of the digestive system. World Health Organization 2010; 2: 1.
11. Hartley AL, Birch JM, Kelsey AM, et al: Epidemiological and familial aspects of hepatoblastoma. Med Pediatr Oncol 1990 ;18: 103-109.
12. Emre S, McKenna GJ: Liver tumors in children. Pediatr Transplant 2004; 8: 632-638.
13. Haas JE, Feusner JH, Finegold MJ: Small cell undifferentiated histology in hepatoblastoma may be unfavorable. Cancer 2001; 92: 3130-3134.
14. Perilongo G, Shafford EA: Liver tumors. Eur J Cancer 1999; 35: 953- 959.
15. De-Ioris M, Brugieres L, Zimmermann A: Hepatoblastoma with a low serum alpha-fetoprotein level at diagnosis: The SIOPEL group experience. Eur J Cancer 2008; 44: 545-550.
16. MacKinlay GA, Pritchard J: A common language for childhood liver tumors. Pediatr Surg Int 1992; 7: 325-326.
17. Tanaka S, Hirohashi K, Tanaka H, Shuto T, Lee SH, Kubo S, et al: Incidence and management of bile leakage after hepatic resection for malignant hepatic tumors. J Am Coll Surg 2002; 195:484–489.
18. Koch M, Garden OJ, Padbury R, Rahbari NN, Adam R, Capussotti L, et al: Bile leakage after hepatobiliary and pancreatic surgery: a definition and grading of severity by the International Study Group of Liver Surgery. Surgery 2011; 149:680–688.