High alpha-fetoprotein levels after liver transplantation in hepatoblastoma: Does it matter?

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Dear Editor:

Serum alpha-fetoprotein (sAFP) is the main biomarker available for the management of unresectable hepatoblastoma undergoing liver transplantation in children(1). Although a rapid decline is indicative for appropriate response to neoadjuvant chemotherapy, the interval at which sAFP should be monitored after transplant and the exact cut-off value have not been fully determined(2). The questions are important, since patients with extended disease have high risk of tumor recurrence and in case sAFP is rising, elaborated imaging modalities are promptly necessitated.

We report a case of a 9-months-old infant with prenatally known Beckwith-Wiedemann syndrome and diagnosed with pretext IV hepatoblastoma at the age of 5 months. Size of hepatoblastoma was 10 x 8
cm in diameter in the right hepatic lobe with additional multiple small lesions in both lobes of the liver. The sAFP concentration was 1048193 μg/l at the start of chemotherapy. After three courses of cisplatin and doxorubicin sAFP values dropped to 902 μg/l. As complete tumor resection could not be achieved with partial hepatectomy, primary transplantation was performed at the age of 7 months. The patient received a full-size liver from a 2-months-old child after neurologic determination of death. Seven days after transplantation the sAFP level was 169 μg/l and within normal levels (at that time the patient showed extensive protein loss of 76 g/24 hours due to ascites). Following the institute post-transplant-protocol, measurement of sAFP showed a dramatic increase to 2644 μg/l at day 27. Other liver tests at that time were unremarkable (AST, ALT, GGT and bilirubine in normal range). As recurrence was suspected, immediate imaging diagnostics, including abdominal ultrasound, thoracic CT and full body MRI under intubation anesthesia were performed. Fortunately, no signs of tumor relapse were detected, sAFP levels dropped to normal values within the following weeks and no post-transplant chemotherapy was required (Figure 1). The patient could be discharged from hospital at 8 weeks after transplant and is in sustained remission at the last follow up after one year.

Taken together, this case illustrates that sAFP concentration in a child after liver transplant for hepatoblastoma can be highly elevated at week 4 after transplant, but caution is advised in using this biomarker as a screening tool for tumor recurrence. Firstly, fluctuating levels of sAFP can reflect acute liver failure (ALF), which is limited to the first week post-transplant and was not diagnosed in the current case(3). Furthermore, elevated sAFP levels can be associated with drugs causing ALF or flare-ups of viral hepatitis(3), which were negative in the current case. However, re-evaluation of organ circumstances revealed that the liver was obtained from a 2-months-old infant, in which elevated physiologic sAFP levels may be reflective of the young donor (Figure 1)(4).

This report demonstrates that sAFP levels can fluctuate after liver transplant and caution is needed in performing stressful investigations and in planning post transplantation chemotherapy. Future guidelines are required to determine the exact time points of sAFP analysis after liver transplant and to clarify if donor sAFP level should be collected as biomarker for assessing recurrence.

Reference list

Figure legend
Figure 1: Development of serum alpha-fetoprotein (sAFP) levels in a 9-month-old child with hepatoblastoma after full-size liver transplantation from a 2-months-old donor (black graph) compared with estimated median physiologic sAFP levels in an 2-months-old preterm (dotted graph) or average 2-months-old child with Beckwith-Wiedemann syndrome (dashed graph)(4).
Figure 1

![Graph showing AFP levels in µg/L over weeks after transplantation.](image-url)

- AFP levels in µg/L
- Weeks after transplantation