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Case report

Subgaleal and epidural metastases of the undifferentiated embryonal sarcoma of the liver ☆☆☆

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ABSTRACT

Undifferentiated embryonal sarcoma of the liver (UESL) is very rare and has a very poor prognosis. UESL metastases have been reported in 5%-13% of the children with UESL and most metastases reported in the literature are present at diagnosis. Metastases reported in the literature belong to the lungs, pleura, and peritoneum. Radiological diagnosis of the UESL remains a poorly understood problem due to its rarity. Most of the reports published in the literature are also based on a relatively small number of patients. Approximately 200 cases have been reported regarding imaging features of this tumor. We reported a girl with UESL, who applied to the emergency department with abdominal pain. The lesion was solid and had cystic areas on ultrasound and there were peripherally enhanced serpiginous vessels in the lesion on Computed Tomography and MRI. Immunohistochemical diagnosis of the lesion was UESL. 26 months after surgery and adjuvant chemotherapy extradural and subcutaneous metastases were detected. These metastasis sites were first described for UESL.

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Introduction

Undifferentiated embryonal sarcoma of the liver (UESL) was first described by Stocker and Ishak in 1978 [1]. It is a primitive mesenchymal tumor that is very rare and has a very poor

prognosis [2]. The incidence of UESL is very low, with 0.6-1.2 cases per 1 million patients, with ninety percent of patients in the pediatric age group – mostly between 6 and 10 years of age [3].

UESL metastases have been reported in 5%-13% of children with UESL and most metastases reported in the literature are

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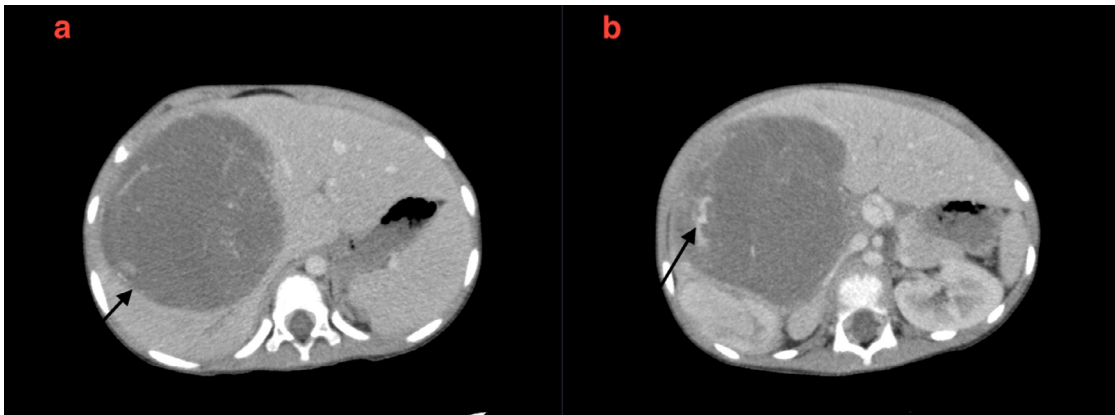


Fig. 1 – 1A, 1B: Axial contrast enhanced CT images: Axial contrast-enhanced CT during the portal phase demonstrated a large predominantly hypodense lesion in the right hepatic lobe (arrow). The margins of the tumor were well defined and smooth and there was predominant peripheral enhancement in the lesion (marked with arrow).

present at diagnosis. Metastases reported in the literature belong to the lungs, pleura, and peritoneum [4].

UESL can often be misdiagnosed radiologically in the pre-operative period [5]. Although magnetic resonance imaging (MRI) is widely used to characterize liver lesions, few reports have to date commented on specific MRI findings in UESL [3]. Approximately 200 cases have been reported in the literature regarding imaging features of this tumor [6].

We aim to discuss the radiological findings of a pediatric patient who was diagnosed with UESL at the age of 2 years and who was diagnosed with metastasis in the epidural and subgaleal area 2 years later. Thus, we aim to present these metastasis sites, which were first described for UESL.

Case history

A 2 years old girl applied to the emergency department with abdominal pain. No significant pathology was detected in physical examination and all laboratory findings were within normal limits. On the abdominal Ultrasound (US) performed in the emergency department there was a hypochoic solid lesion with a size of 12*11*10 cm in the right lobe of the liver, containing cystic areas. On abdominal Computed Tomography (CT) a 12*11*11 cm, well-circumscribed lesion was seen and there were peripherally enhanced serpiginous vessels and septa in the lesion (Fig. 1). The lesion was filled the entire right lobe.

The patient's serum Alfa fetoprotein (AFP) and beta human chorionic gonadotropin levels were within normal limits.

MRI was planned to evaluate the internal structure of the tumor more clearly. On MRI, the lesion was hypointense predominantly and including hyperintense areas in T1WI (T1-weighted image) (Fig. 2A) and hyperintense predominantly with hypointense septa in T2WI (T2-weighted image) (Fig. 2B). Fluid-fluid levels due to hemorrhage were seen in T1W sequence (Fig. 2A). Heterogeneous diffusion restriction was present in DWI (diffusion-weighted image). In contrast-enhanced sequence, significant progressive en-

hancement was observed in the septa but not in the entire lesion (Fig. 2C and D). In addition, the lesion was compressing the branches of the VCI, hepatic vein and portal vein.

Percutaneous tru-cut biopsy of the lesion was not diagnostic. There was no detected metastatic lesion. Since the tumor was thought as malignant radiologically and clinically, right hepatectomy was performed for the patient. Immunohistochemical diagnosis of the lesion was UESL. No recurrence or metastasis was detected for 26 months in the follow-up of the patient, who was given adjuvant chemotherapy.

After 26 months, the patient admitted to the emergency department with a palpable mass in the occipital region after she had a minor head trauma caused by falling from a 50 cm chair. She had a cranial CT in the pediatric emergency department. A 4.5*3.5 cm well-defined and hypodense lesion in extradural area, and a 3*1.2 cm hyperdense lesion in the subcutaneous area were observed on the CT (Fig. 3A). There was no lytic defect in the bone (Fig. 3B). Contrast-enhanced brain MRI was performed for the patient with suspected metastasis. The lesions were hypointense in T1WI and heterogeneous hyperintense in T2WI (Fig. 4). In T2WI, there were many millimetric hypointense foci within the lesions (Fig. 4C and D). In contrast-enhanced images, contrast enhancement was present in the periphery of the lesion (Fig. 4B). The radiological features of the lesions were similar to the primary tumor, especially in the lesion in the extradural area. Our diagnosis was epidural and subgaleal metastases from the primary tumor and histopathological diagnosis of the excised material confirmed our diagnosis.

No recurrence or metastatic lesion had been observed for 1 year in the patient who continued chemotherapy treatment after brain surgery.

Discussion

UESL is one of the most common tumors of the liver in children, along with HCC (hepatocellular carcinoma), hepatoblastoma, and epithelioid hemangioendothelioma, accounting for

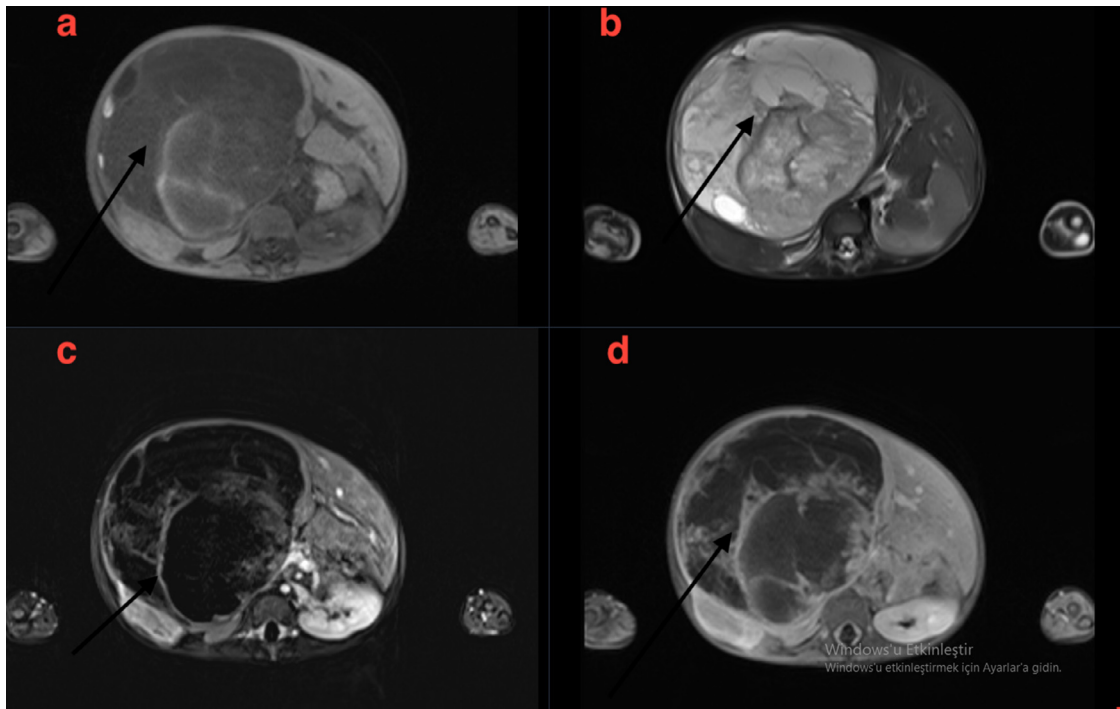


Fig. 2 – A. Axial T1W image: The lesion in the right hepatic lobe was well defined and hypointense with fluid-fluid levels in axial T1W image (marked with arrow). **B.** Axial T2W image: The lesion was predominantly hyperintense in axial T2W image and there were hypointense septations in the lesion marked with arrow). **C, D.** Axial postcontrast T1W images: Progressive enhancements were seen in arterial and delayed phases of the axial post contrast T1 weighted images.

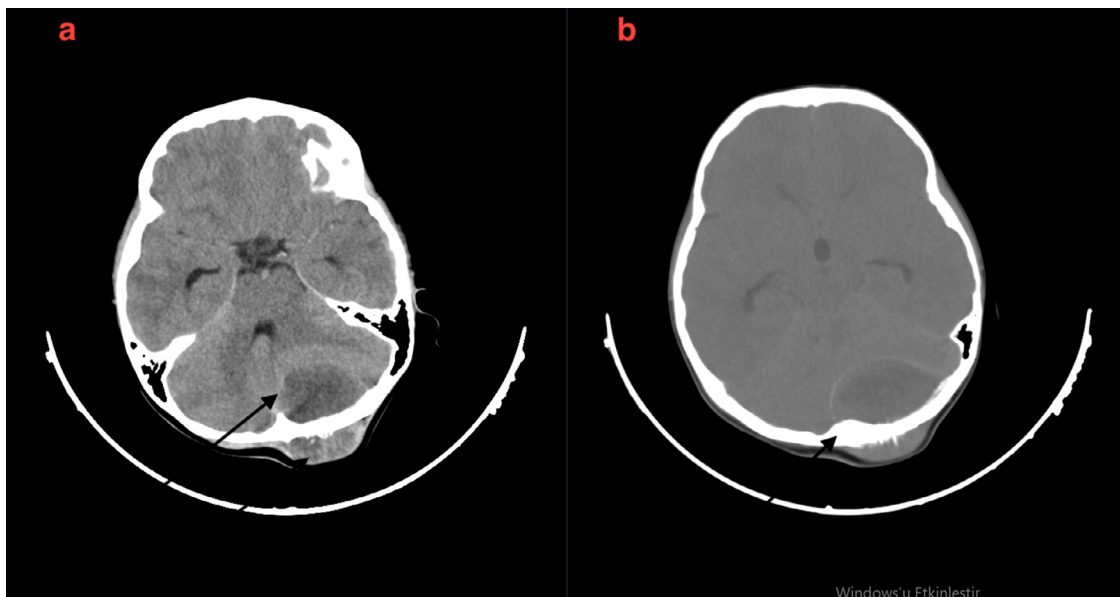


Fig. 3 – A. Axial brain CT, brain window: There was a 4.5*3.5 cm well defined and hypodense lesion in the extradural area of the right occipital lobe in axial brain CT and 3*1.2 cm hyperdense lesion in the subcutaneous area of the right occipital lobe (marked with arrow). **B:** Axial brain CT, bone window: There was no lytic defect in the bone (marked with arrow).

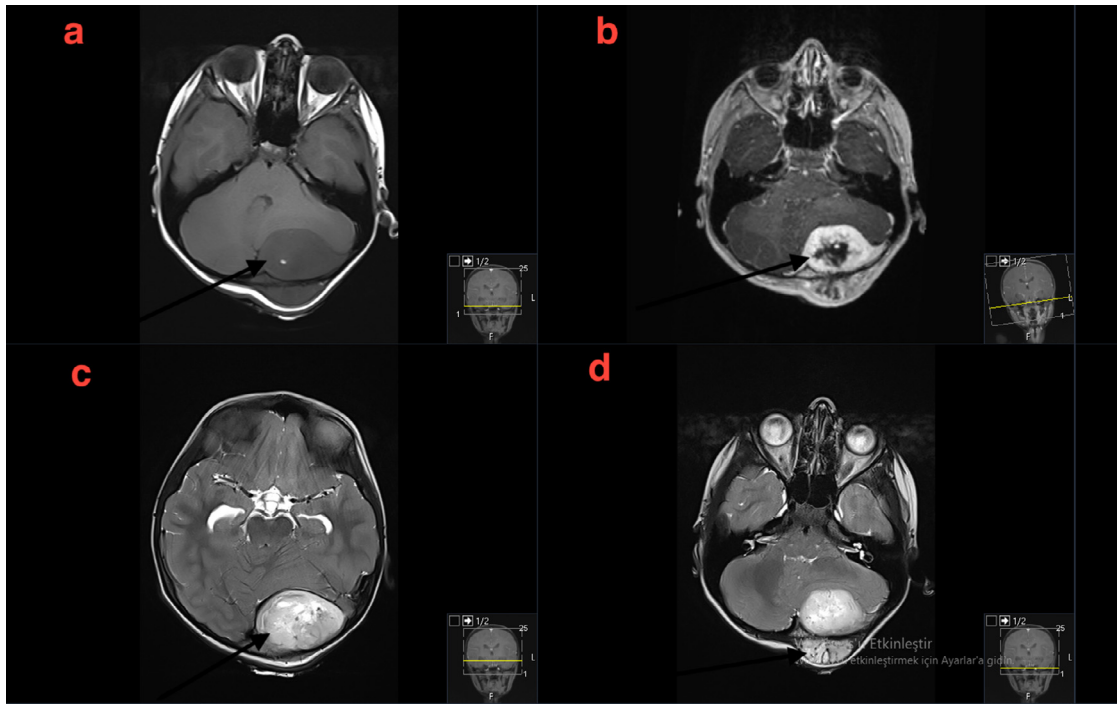


Fig. 4 – Axial T1W image: The lesions in the extradural and subcutaneous areas of the occipital lobe were hypointense with millimetric hyperintense foci in axial T1W image (marked with arrow). B. Axial postcontrast T1W image: There was diffuse enhancement in the periphery of the lesion in the extradural area in axial postcontrast T1W image and there was no contrast enhancement in the central area (marked with arrow). C, D: Axial T2W images: The lesions in the extradural and subcutaneous areas of the occipital lobe were heterogeneous hyperintense with millimetric hypointense areas in axial T2W image (marked with arrow).

9%-15% of all cases [7]. Most of the patients are between 6-10 years of age, with an average age of 9. The youngest case reported in the literature is 4 months old [8]. Our case was also 2 years old and was younger than most cases presented in the literature.

Although most of the children presenting with this tumor are asymptomatic, they may also present with the rupture of the tumor and associated abdominal pain [7]. In contrast to other malignant liver tumors in children, serum AFP level is generally within normal limits. Although very rarely, AFP elevation has been reported in adult patients [9]. This is important for the differential diagnosis of the pediatric malignant liver tumors. The patient presented here applied to the emergency department with severe abdominal pain and all laboratory data were normal at the index application. The primary radiological examinations performed in the emergency department were considered as hepatoblastoma and HCC. The normal AFP of the patient helped to exclude these diagnoses.

Radiological diagnosis of the UESL remains a poorly understood problem due to its rarity. Most of the reports published in the literature are also based on a relatively small number of patients. On US, it is usually seen as a solitary hyper-isoechoic and well-circumscribed lesion larger than 10 cm. It can contain cystic and solid components, and septations. UESL location is almost always in the right lobe of the liver [2,3,5]. There may be hyperechoic and cystic areas compatible with foci of necrosis, bleeding or myxoid degeneration within the

lesion [2,5]. In our case, the lesion was iso-hypoechoic with solid component and had minimal peripheral vascularity on Doppler US. The lesion had a cystic component. There were also mural nodules that were hyperechoic.

On CT, it is usually seen as a hypodense, well-circumscribed lesion with peripheral septations [2,5,6]. Hyperdense foci of acute bleeding and calcifications may be found within the lesion [5]. The presence of serpiginous vessels in the tumor, which was first described by Gabor et al., is a specific finding supporting the diagnosis [5]. In our case, the lesion was hypodense in CT and these serpiginous vessels, which were enhanced in the arterial phase, were also seen on CT in our case.

On MRI, it is usually hyperintense on T2WI and hypointense on T1WI. Intralesional T1 hyper- T2 hypointense foci suggest intratumoral hemorrhage. Central T1 hypo-T2 hyper areas are pathologically defined as necrosis [5]. Moderate progressive enhancement can be seen in the lesion on postcontrast MR image [2,5,6]. Our case was hyperintense and had hypointense septations in the lesion. On T2-WI in our patient there were multiple fluid levels and this feature has been defined due to intralesional bleeding in this tumor in recent years [3,7].

UESL metastases occur in 5%-13% of children, and these metastases have been reported to occur most frequently in the lung, adrenal gland, peritoneum, and pleura [10]. In the cases presented in the literature, metastases were usually

present at the time of the diagnosis [6,10]. In the study with the highest reported number of pediatric patients, 4 of 25 patients had metastases and all metastases were in the lung [11]. In our case, there was a 2-year disease free period between primary tumor diagnosis and the development of subgaleal and extradural metastases. A metastasis at these regions has never been reported in the literature before. The patient presented here was the first case presented with a such metastasis without lung metastases.

The most common tumors that should be considered in the differential diagnosis are mesenchymal hamartoma, hydatid cyst in endemic areas, abscess, hepatoblastoma and HCC [5]. Although we first thought that the tumor was malignant with radiological findings, we could not state the diagnosis of UESL as a preliminary diagnosis. After we learned that the AFP value was normal, we decided that the lesion might be UESL or mesenchymal hamartoma.

The cystic mesenchymal hamartoma is the most difficult tumor to differentiate with UESL [5]. Both UESL and cystic mesenchymal hamartoma can be cystic, mixed cystic-solid or solid in radiological examinations [12]. UESL can be considered in favor, if there are signal features compatible with bleeding on MRI images, since bleeding into the cyst is rare in cystic mesenchymal hamartoma [12]. The presence of serpiginous vessels in the lesion described by Gabor et al. [5] is a feature not found in cystic mesenchymal hamartoma and favors UESL. Also, cystic mesenchymal hamartoma is usually seen around 2 years of age, younger than UESL [5]

UESL had a rather poor prognosis in the past, with a survival rate of less than 37% [13]. Today the long-term survival rate of UESL patients has improved significantly since the widespread use of multimodal therapy, including primary resection, neoadjuvant or adjuvant chemotherapy, and is currently reported to be >70% [2]. Today, complete resection of the liver tumor with adjuvant chemotherapy appears to be the mainstay of the treatment. The prognosis of the pediatric patients is relatively better than adults [14]. Although our case progressed with an atypical metastasis, the patient was still alive 3 years after diagnosis with surgical resections and chemotherapy.

Conclusion

Nonspecific clinical signs of UESL, solid radiological appearance on US but cystic appearance on CT, and failure to diagnose due to a cystic component in percutaneous biopsy cause delays in the diagnosis and treatment of this tumor, which decreases the prognosis. Multidisciplinary approach is very important in this tumor.

Author contributions

All authors contributed equally to the drafting, designing and writing of the manuscript and provided critical revision. All authors read and approved the final manuscript.

Patient consent

The parents of the patient declared their fully consent for the publication of the case.

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