CASE REPORT

Neonatal Neuroblastoma with Pepper Syndrome: A Case Report

Shishir Kumar Jha, Reena Tomar, Yogesh Kumar Sarin*

Department of Pediatric Surgery, Maulana Azad Medical College, New Delhi - 110002, India

How to cite: Jha SK, Tomar R, Sarin YK. Neonatal neuroblastoma with pepper syndrome: A case report. J Neonatal Surg. 2019;8:3.

ABSTRACT

Pepper syndrome can be associated with significant hepatomegaly causing an increase in abdominal volume to the extent of causing respiratory distress. Here, we present a neonate who succumbed to classical Pepper syndrome.

Key words: Neonatal neuroblastoma; Pepper Syndrome

INTRODUCTION

Abdominal neuroblastomas are the most common extracranial malignancy in childhood, but neonatal neuroblastomas are rare. Neuroblastomas with stage 4S are considered to have favorable prognosis but can be fatal for neonates due to hepatic decompensation or inferior vena cava (IVC) compression.

CASE REPORT

A 3-day-old male presented with respiratory distress with massive abdominal distension. Physical examination revealed tachypnea (60/min), tachycardia with gross abdominal distension, along with bilateral pedal edema. Skin examination was negative for any metastatic deposits. Pregnancy was uneventful and antenatal obstetric scans were not done. Birth weight was 2.6 kg and there was no history of birth asphyxia. On examination, he was in respiratory distress, febrile (38.8°C), and irritable with bilateral pitting pedal edema. Abdominal examination revealed abdominal distension, girth of 50 cm, measured at the level of the umbilicus. There was hepatosplenomegaly (the liver was palpated 11 cm below the right costal margin and the spleen 5 cm below the left costal margin). He had hypoxemia (oxygen saturation of 89%) and tachycardia (heart rate of 176 beats/min). Abdominal ultrasound scan showed gross hepatomegaly. Chest X-ray showed prominent bronchovascular markings but no pleural effusion. Blood examinations revealed raised lactate dehydrogenase (800 IU/L; normal range 40–350 IU/L) and ferritin levels (560 ng/ml; normal range - 30–400 ng/ml). Routine blood investigations were within normal limits. INR was 3.2. Contrast-enhanced computed tomography abdomen was suggestive of the right suprarenal neuroblastoma with hepatic metastases. Bone marrow aspiration and bone scan were negative. Trucut biopsy was suggestive of neuroblastoma with positivity for chromogranin and synaptophysin. Radiotherapists refused to administer therapeutic radiation. Due to poor general condition of the neonate, informed consent was taken from the parents for urgent surgical intervention and the patient was taken up for decompressive laparotomy. There was massive hepatomegaly. A right suprarenal mass measuring 5.2*4.6*4.4 cm was excised; wedge biopsy of the liver was also taken. Abdominal incision could not be closed due to massive enlargement of liver. Mesh was placed and abdomen was left open akin to laparostomy. The operative time was 1.5 h, and there was no significant intraoperative blood loss. Postoperatively, the patient was ventilated in view of the poor respiratory reserve due to elevated diaphragm (Figure 1). Histopathology revealed small round tumor cells arranged in small clusters, arranged in rosettes pattern and positive for synaptophysin on immunohistochemistry (Figures 2-4). Liver biopsy was positive for metastasis. The patient eventually developed coagulopathy and succumbed on POD 6; blood culture was sterile.

DISCUSSION

Neonatal tumors comprise only 2% of all pediatric malignancies, the most common of them being neuroblastoma, and most common of all neuroblastomas is stage 4S [1]. Stage 4S was first described by Evans et al. as a special group of patients younger than 1 year

Correspondence*: Yogesh Kumar Sarin, Department of Pediatric Surgery, Maulana Azad Medical College, New Delhi - 110002, India.
E-mail: yksarin@gmail.com

Submitted: 26-09-2018 Accepted: 27-09-2018
Conflict of interest: None declared Source of Support: Nil

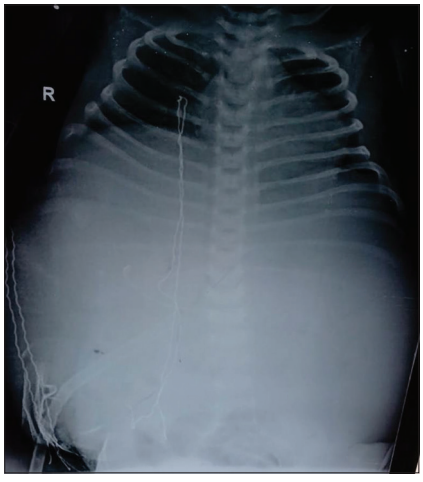

Figure 1: X-Ray chest and abdomen showing ground glass appearance of massively distended abdomen and raised diaphragm

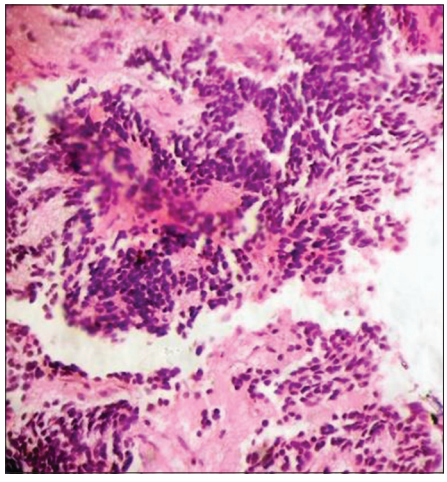

Figure 3: Histopathology showing round tumor cells arranged in small clusters and also scattered singly (H and E stain, ×40 magnification)

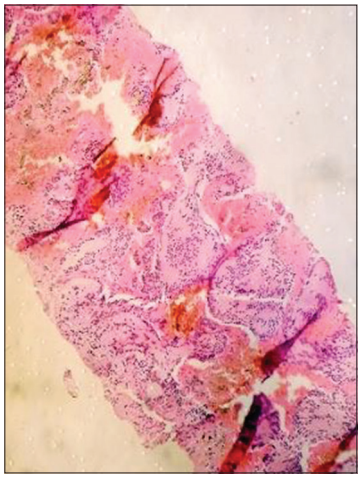

Figure 2: Histopathology showing round tumor cells arranged in small clusters and also scattered singly (H and E stain, ×4 magnification)

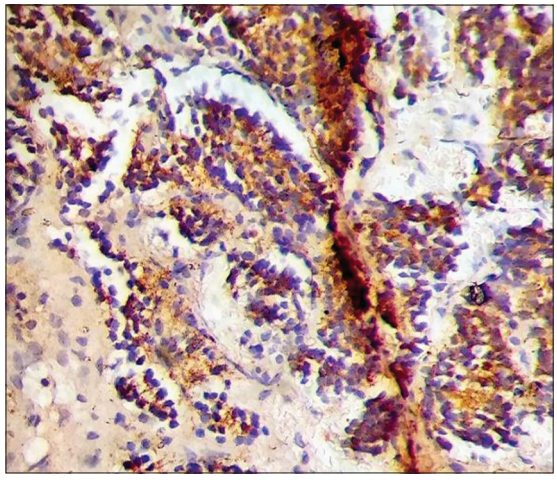

Figure 4: Tumor cells positive for synaptophysin on immunohistochemistry (×40 magnification)

with localized primary tumor Stage 1, Stage 2A, or Stage 2B, with dissemination limited to skin, liver, <10% nucleated cells in bone marrow, and a negative MIBG scan [2].

The common mode of presentation in Pepper syndrome is abdominal distension due to diffusely involved liver, associated with respiratory distress, and coagulopathy. The coagulopathy is a result of hepatic dysfunction due to metastases. The palpable abdominal mass may be primary tumor itself, or may be a sign of metastasis, as in our case. Visceral metastases present as lump, skin metastases are known as blueberry muffin spots [3].

Neuroblastoma is the most common extracranial solid tumor of childhood [4], but neonatal neuroblastoma is rare. Neuroblastoma can also be diagnosed antenatally on fetal ultrasound. Differential diagnosis of a suprarenal mass includes adrenal hemorrhage, extrapulmonary sequestration, bronchogenic cyst, or renal duplication [5]. In cases, where ultrasonogram is unable to narrow down the differential diagnosis, fetal magnetic resonance imaging (MRI) comes to aid. A "claw sign" on MRI confirms the origin of mass. Fetal MRI is sensitive in diagnosing hepatic metastases. The short tau inversion recovery sequences have been found helpful in diagnosing stage 4 or 4S [1].

Stage 4S neuroblastoma is defined as metastatic neuroblastoma in infants. It is characterized by a localized primary tumor with metastases limited to skin, liver, or bone marrow. Most cases in neonatal period spontaneously regress [6]. The 4S stage patients with massive hepatic enlargement and resultant respiratory and cardiac symptoms may require surgical intervention, low-dose chemotherapy, or radiotherapy, although in majority of the patients, the disease spontaneously remits. The main reasons for poor outcome in 4S patients are mainly due to massive hepatic involvement, leading to hypoalbuminemia, coagulopathy, and respiratory distress due to large size of liver [7]. It has been reported

that the liver may get enlarged to an extent causing IVC compression and thus precipitating IVC syndrome. IVC syndrome can occur due to mechanical compression of IVC by the tumor mass, or due to intracaval tumor thrombus, sometimes extending up to the right atrium, main cause of death being in IVC syndrome being circulatory collapse by mechanical compression [8].

Overall, survival of neonatal neuroblastoma has been found to be 91%, which is better than any age group. Survival of prenatally diagnosed neuroblastoma has been found to be 90%. The International Neuroblastoma Staging System has estimated a rate of the progression of stage 4S to stage 4 to be around 1–2% [1].

To conclude, though stage 4S neuroblastoma neonates and young infants are known to have survival rates >90%, few of them may have poor outcomes in spite of an aggressive management approach.

REFERENCES

1. Moppett J, Haddadin I, Foot AB. Neonatal neuroblastoma. Arch Dis Child Fetal Neonatal Ed 1999;81:F134-7.
2. Evans AE, D'Angio GJ, Randolph J. A proposed staging for children with neuroblastoma. Children's cancer study group A. Cancer 1971;27:374-8.
3. Omoseebi O, Odubanjo MO, Akinde OR, Ikeri NZ, Ademuyiwa AO, Adeyomoye AA, et al. Neonatal neuroblastoma with adrenal primary and metastasis to the liver: A case report and a review of literature. Afr J Paediatr Surg 2016;13:217-22.
4. Venkatesh HI, Mohanty PK, Razak A, Nagesh NK. Perinatal neuroblastoma: A hidden bullet in the chest. BMJ Case Rep 2014;2014:Bcr2013202350.
5. Delahaye S, Doz F, Sonigo P, Saada J, Mitanchez D, Sarnacki S, et al. Prenatal diagnosis of dumbbell neuroblastoma. Ultrasound Obstet Gynecol 2008;31:92-5.
6. Weintraub M, Waldman E, Koplewitz B, Bloom AI, Gross E, Freeman AI, et al. A sequential treatment algorithm for infants with stage 4s neuroblastoma and massive hepatomegaly. Pediatr Blood Cancer 2012;59:182-4.
7. Fisher JPH, Tweddle DA. Neonatal neuroblastoma. Semin Fetal Neonatal Med 2012;17:207-15.
8. Alan S, Cakir U, Kahvecioglu D, Gordu Z, Erdeve O, Dincaslan H, et al. Neonatal neuroblastoma with inferior vena cava syndrome. APSP J Case Rep 2013;4:10.