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Congenital Mesoblastic Nephroma with Tumor Rupture and Hemorrhagic Shock in a Term Neonate: A Case Report

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Case Report

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Abstract

Background:

Congenital mesoblastic nephroma (CMN) represents the most frequent renal neoplasm occurring in neonates and young infants [1,2]. Although this tumor is generally considered benign, certain histologic variants and complications—such as spontaneous rupture or internal hemorrhage—can result in critical, life -threatening situations [3].

Case Presentation:

We describe a term male neonate (gestational age: 37 + 4 weeks) delivered by cesarean section with normal Apgar scores. Prenatal ultrasonography was unremarkable until the second trimester; however, a large left-sided abdominal mass was detected at 37 weeks. On the first postnatal day, the infant developed progressive abdominal distension, declining hemoglobin levels, and hemodynamic instability. Ultrasonography demonstrated a large heterogeneous solid–cystic mass arising from the left kidney, extending across the midline, accompanied by echogenic ascites suggestive of tumor rupture. Emergency laparotomy revealed a ruptured left renal mass with active bleeding, and a radical nephrectomy was performed. Histopathologic evaluation confirmed a classic-type congenital mesoblastic nephroma with focal necrosis, hemorrhage, and sinus invasion, but no renal vein involvement. The postoperative course was uneventful, and adjuvant therapy was not required

Conclusion:

Although CMN is typically benign, rupture and hemorrhagic shock may occur, particularly in the cellular or mixed subtypes. Early recognition and prompt surgical intervention are crucial for survival. Clinicians—including neonatologists, pediatric surgeons, and pathologists—should be aware of this rare but potentially fatal presentation.

Introduction

Congenital mesoblastic nephroma (CMN) is the most common renal tumor encountered during the neonatal period and early infancy, most often diagnosed within the first three months of life [1]. While the classic variant is generally benign, the cellular and mixed types demonstrate more aggressive clinical behavior, with tendencies toward local invasion, recurrence, and, on rare occasions, malignant transformation [2, 3].

Prenatal imaging modalities, including ultrasonography and magnetic resonance imaging (MRI), can facilitate early detection of renal masses; nonetheless, acute postnatal presentations caused by tumor rupture or internal hemorrhage remain exceptionally uncommon but potentially life-threatening [4, 5].

Herein, we report a rare case of congenital mesoblastic nephroma presenting with tumor rupture and hemorrhagic shock in a term neonate, successfully managed through radical nephrectomy.

Case Presentation

A term male neonate was delivered at 37 weeks and 4 days of gestation to a gravida 2, para 2 mother via repeat cesarean section. The infant had normal Apgar scores, and his birth weight was 3,950 g. The prenatal course was uneventful, with routine ultrasonographic evaluations yielding normal results until the second trimester. However, a follow-up ultrasound performed at 37 weeks' gestation revealed a sizable left-sided abdominal mass.

On the first day of life, the neonate was referred to our tertiary center due to rapidly increasing abdominal distension, a drop in hemoglobin concentration, and signs of hemodynamic instability.

Imaging findings:

Ultrasonography on admission demonstrated a large, heterogeneous solid–cystic mass occupying the left abdomen and extending into the lower quadrant and pelvis, crossing the midline. The upper pole of the left kidney retained normal morphology, while the mid and lower poles were compressed into a thin parenchymal rim. The lesion exhibited multiple cystic areas with internal echoes and interspersed solid components that showed mild vascularity on color Doppler examination. Additionally, mild ascites with echogenic content was observed, highly suggestive of tumor rupture.

A linear-probe ultrasound image displayed a residual rim of renal parenchyma encasing the upper pole of the mass ("claw sign"), confirming the renal origin of the tumor. Another curvilinear-probe view depicted a relatively well-defined, heterogeneous mass in the left upper quadrant with no significant intralesional vascularity.

Surgical management:

Given the clinical and sonographic suspicion of rupture with active hemorrhage, an emergency laparotomy was performed under general anesthesia through a left transverse abdominal incision. Intraoperatively, a massive ruptured tumor originating from the left kidney was encountered, accompanied by ongoing bleeding. After mobilization of the colon, the renal hilum was dissected, and the vessels were ligated using 3 – 0 Vicryl sutures. A left radical nephrectomy was completed, with distal ureteral ligation. Hemostasis was achieved, and the peritoneal cavity was irrigated before layered closure.

Pathologic findings:

Gross examination revealed a heterogeneous mass containing extensive areas of necrosis and hemorrhage. Microscopic analysis confirmed the diagnosis of congenital mesoblastic nephroma, classic type, characterized by sinus invasion and capsular disruption but without renal vein involvement. Assessment of extracapsular spread was limited due to the preexisting rupture.

Microscopic examination revealed a tumor composed of intersecting fascicles of spindle cells, featuring slit like vessels and low mitotic activity infavour of classic type CMN.

Postoperative course:

The infant's postoperative recovery was smooth and uneventful. Because the resection was complete and no evidence of metastasis or systemic disease was detected, adjuvant chemotherapy was deemed unnecessary. During follow-up, the patient remained clinically well with no signs of recurrence.

Discussion

Congenital mesoblastic nephroma typically presents during the neonatal period as an abdominal mass detected incidentally or on prenatal imaging [1, 4].While the classical variant is typically benign and associated with favorable outcomes, the cellular and mixed forms may exhibit more aggressive biological behavior, including local invasion, recurrence, and, on rare occasions, distant spread [6, 7].

Spontaneous tumor rupture accompanied by hemorrhagic shock represents an exceptionally rare manifestation of CMN [5]. Hirose and colleagues (1991) reported a case in which a newborn presented with severe hemorrhage and disseminated intravascular coagulation secondary to tumor rupture [11].Similarly, Jeong et al. (2006) described a neonate who developed massive hematuria and shock as a result of CMN rupture [12]. The present case aligns with these rare reports, emphasizing that even histologically benign tumors may present with catastrophic complications in early life.

In our patient, the combination of prenatal detection at 37 weeks, rapid postnatal deterioration, and intraoperative confirmation of rupture underscores the importance of vigilant monitoring when large renal masses are identified late in gestation. Although most CMN cases respond well to surgical removal, prompt recognition and early intervention are critical when complications such as hemorrhage or rupture occur. Radical nephrectomy remains the standard of care and typically yields excellent outcomes when complete excision is achieved.

Given the rarity of such presentations, this case adds to the limited body of literature highlighting CMN as a potential cause of life-threatening hemoperitoneum in neonates. A multidisciplinary approach involving neonatologists, pediatric surgeons, anesthesiologists, and pathologists is essential for timely diagnosis, optimal surgical management, and favorable prognosis.

The differentiation between Wilms tumor and congenital mesoblastic nephroma cannot be completely achieved by radiologic or ultrasonographic findings alone; ultimately, histopathologic evaluation remains the decisive diagnostic tool [9, 10].

Conclusion

Although congenital mesoblastic nephroma is generally considered a benign renal neoplasm of infancy, clinicians should recognize that certain subtypes can present with severe and unexpected complications such as spontaneous rupture and hemorrhagic shock[3, 6]. Early identification through prenatal or immediate postnatal imaging, coupled with rapid surgical intervention, is vital for survival.

Awareness of these rare but critical presentations is necessary among healthcare professionals managing neonatal abdominal masses to ensure prompt diagnosis, appropriate treatment, and improved patient outcomes[8].

Declarations

The patients consented to participate in and publish the study.

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Author Contribution

Elham Zarei contributed to the study design, supervision of the project, and critical revision of the manuscript as the senior author.Fariba Jahangiri performed the surgical procedures and contributed to data collection.Nafiseh Mortezavi provided the pathological diagnosis and contributed to histopathological evaluation and interpretation of the findings.Yousef Tabarestani contributed to the literature review, manuscript drafting, and preparation of the final version of the manuscript.All authors reviewed and approved the final manuscript.

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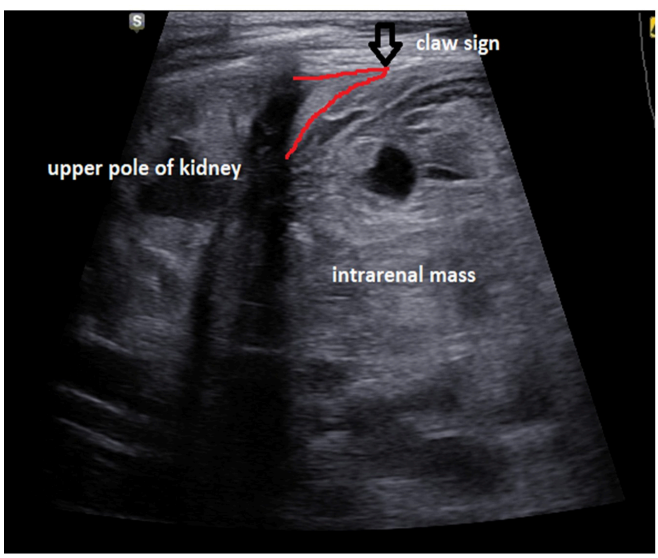
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Figures



Figure 1

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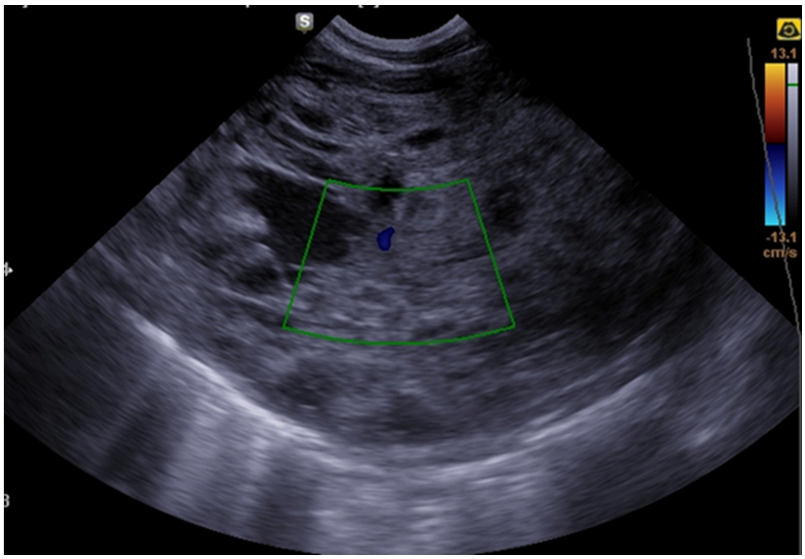


Figure 2

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Figure 3

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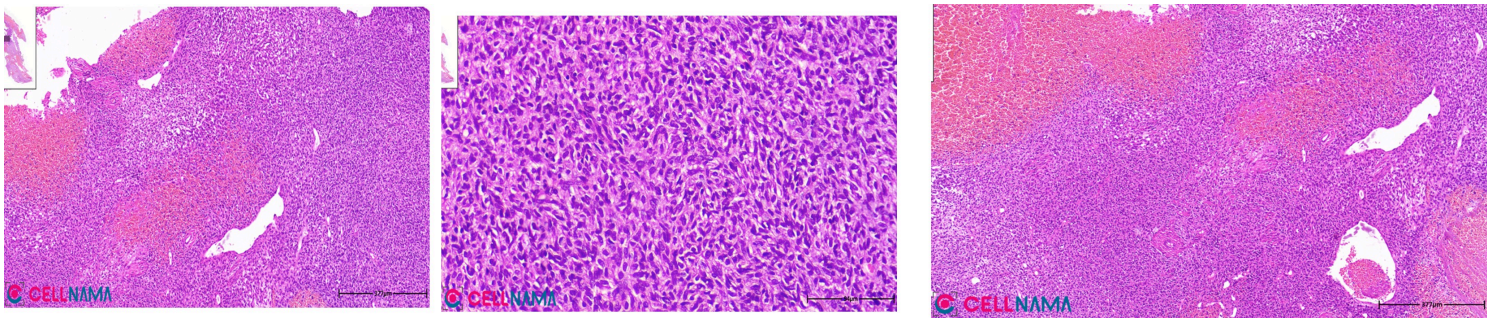


Figure 4

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