

Case Report Article

Multidisciplinary Management in Late-Pregnancy Fetal Omphalocele: A Case Report of Prenatal Diagnosis and Perinatal Planning

Yusi Farida^{1*}, Nurul Islamy²

¹ Department of Obstetrics and Gynecology, Faculty of Medicine, Sriwijaya University, Palembang 30126, Indonesia

² Faculty of Medicine, Lampung University / Abdul Moeloek General Hospital, Dr. Rivai Street No. 6, Tanjung Karang, Lampung, Indonesia

*Corresponding author: yusifaridaaa@yahoo.co.id; yusifaridaaa14@gmail.com

ABSTRACT

Omphalocele is a congenital anterior abdominal wall defect characterized by herniation of abdominal viscera into the base of the umbilical cord, covered by a membranous sac. The condition is associated with significant perinatal morbidity and mortality, particularly when accompanied by other congenital anomalies. Prenatal diagnosis allows comprehensive counseling and multidisciplinary planning to optimize maternal and neonatal outcomes. To describe the clinical presentation of a pregnancy complicated by fetal omphalocele and to highlight the role of multidisciplinary decision-making in determining the optimal timing and mode of delivery. A 20-year-old primigravida (G1P0A0) at 35 weeks of gestation was referred with a singleton live fetus in cephalic presentation diagnosed prenatally with omphalocele. Maternal condition was stable and no signs of labor were present. Detailed fetal evaluation and multidisciplinary consultation involving obstetrics, neonatology, pediatric surgery, and anesthesiology were conducted. A joint conference was held to determine perinatal management and delivery planning, taking into consideration gestational age, fetal condition, anticipated neonatal surgical needs, and available healthcare resources. Individualized management was established to optimize neonatal stabilization and postnatal surgical intervention. Prenatal identification of fetal omphalocele requires coordinated multidisciplinary management. Joint decision-making facilitates individualized delivery planning, improves perinatal preparedness, and may contribute to better maternal and neonatal outcomes.

Keywords: Omphalocele; Prenatal Diagnosis; Multidisciplinary Management; Perinatal Planning

1. INTRODUCTION

Congenital anomalies are structural or functional abnormalities present at birth that may result from genetic, environmental, or multifactorial causes. Globally, an estimated 7.9 million infants are born each year with major congenital anomalies, with more than 90% occurring in low- and middle-income countries. According to data from the World Health Organization (WHO), congenital anomalies contribute substantially to neonatal morbidity and mortality. In Indonesia, the prevalence of congenital anomalies has been estimated at approximately 59.3 cases per 1,000 live births, accounting for a significant proportion of neonatal deaths. Among congenital abdominal wall defects, omphalocele is recognized as one of the most common conditions, with a reported global prevalence ranging from 1.0 to 3.8 per 10,000 live births (Conner et al., 2018; Roux et al., 2018).

Omphalocele is a congenital defect of the anterior abdominal wall characterized by herniation of abdominal viscera through the umbilical ring, covered by a membranous sac consisting of peritoneum and amnion. The defect may range from small lesions containing only intestinal loops to giant omphaloceles involving the liver and other abdominal organs. Embryologically, omphalocele results from the failure of the midgut and associated viscera to return to the abdominal cavity during fetal development. Although the exact etiology remains unclear, the condition has been associated with chromosomal abnormalities, genetic syndromes, maternal age extremes, multiple gestations, and various environmental or maternal factors, including medication exposure during pregnancy (Antara & Artana, 2018; Maritska & Kinanti, 2016).

Accurate prenatal diagnosis of abdominal wall defects is essential for optimizing perinatal management, including delivery planning, neonatal stabilization, and postnatal surgical intervention. Management of omphalocele requires close collaboration among a multidisciplinary team consisting of obstetricians, perinatologists, neonatologists, pediatric surgeons, and anesthesiologists. This report aims to describe the prenatal diagnosis and multidisciplinary management of a pregnancy complicated by fetal omphalocele and to highlight the importance of coordinated perinatal decision-making in achieving optimal maternal and neonatal outcomes (Hijkoop et al., 2019).

2. CASE ILLUSTRATION

A 20-year-old primigravida (G1P0A0) at 35 weeks of gestation was referred to the tertiary referral obstetric clinic from a regional hospital in Lampung, Indonesia, with a prenatal diagnosis of fetal omphalocele. The patient had attended regular antenatal care visits with both a midwife and an obstetrician throughout pregnancy. She reported no abdominal pain, vaginal bleeding, leakage of fluid, abnormal vaginal discharge, trauma, medication exposure, or significant medical history. Fetal movements were perceived normally, and there was no family history of congenital anomalies.

On physical examination, the patient was in good general condition with stable vital signs. Obstetric examination revealed a singleton pregnancy with cephalic presentation. Fundal height measured 28 cm, fetal heart rate was 158 beats per minute, and estimated fetal weight was approximately 2,325 g. No uterine contractions were present, and speculum examination demonstrated a closed cervical os without vaginal bleeding or amniotic fluid leakage.

Ultrasonographic evaluation demonstrated a live singleton intrauterine fetus consistent with 35 weeks of gestation and an estimated fetal weight of 2,407 g. A 5.04-cm anterior abdominal wall defect was identified, with herniation of the bowel, liver, and stomach enclosed within a membranous sac, consistent with extracorporeal omphalocele. Amniotic fluid volume and Doppler parameters were within normal limits, and the placenta was located at the uterine fundus (Fig. 1). Laboratory investigations, including complete blood count, liver and renal function tests, blood glucose, and infectious disease screening, were unremarkable.



Figure 1. Prenatal ultrasonography (19th June 2025) demonstrating extracorporeal omphalocele at 35 weeks of gestation.

At 37 weeks of gestation, the patient underwent an elective cesarean delivery. A live neonate was delivered with an extracorporeal omphalocele identified immediately after birth, characterized by herniation of abdominal contents enclosed within an intact membranous sac. Following initial neonatal stabilization, the infant was evaluated by the pediatric surgery team. Considering the clinical condition and the intact omphalocele sac, conservative management was initiated. The omphalocele was carefully protected and covered with sterile gauze dressings to prevent fluid loss, minimize the risk of infection, and preserve sac integrity while awaiting further assessment and definitive surgical planning. The neonate remained hemodynamically stable during the early postnatal period and was managed under close multidisciplinary observation (Figure 2).



Figure 2. Extracorporeal omphalocele identified immediately after cesarean delivery, demonstrating herniation of abdominal viscera enclosed within an intact membranous sac. Conservative postnatal management of extracorporeal omphalocele with sterile gauze dressing applied to protect the sac and prevent fluid loss and infection.

3. DISCUSSION

Omphalocele is a major congenital anterior abdominal wall defect that can usually be recognized prenatally by ultrasonography, which remains the primary imaging modality for diagnosis. In this case, the diagnosis was established antenatally by serial ultrasound findings demonstrating a membranous midline abdominal wall defect with herniation of abdominal viscera through the umbilical ring. The sonographic measurements, including the omphalocele-to-abdominal and omphalocele-to-head circumference ratios, suggested a large defect and supported the need for careful perinatal planning. Prenatal imaging is not only important for confirming the diagnosis, but also for distinguishing omphalocele from

gastroschisis and for identifying additional structural abnormalities that strongly influence prognosis and neonatal management (Akinkuotu et al., 2015; Chircor et al., 2018; Linnaus et al., 2016).

The etiology of omphalocele is multifactorial and remains incompletely understood. Several risk factors have been described, including genetic abnormalities, chromosomal syndromes, maternal infection, drug exposure, smoking, folate deficiency, hypoxia, and polyhydramnios. Omphalocele is also frequently associated with other congenital syndromes such as Beckwith-Wiedemann syndrome, pentalogy of Cantrell, and various chromosomal disorders, with a substantial proportion of cases having concurrent anomalies involving the heart or other organ systems. In the present case, antenatal screening did not reveal obvious maternal systemic disease, but the presence of a large extracorporeal defect still placed the fetus in a higher-risk category, underscoring the importance of systematic prenatal evaluation and counseling (Bastiani et al., 2019; Bauman et al., 2016; Smith & Smith, 2020).

Once omphalocele is diagnosed prenatally, management should be individualized and discussed through a multidisciplinary team involving obstetricians, neonatologists, and pediatric surgeons. The literature emphasizes the importance of informed consent, repeated ultrasound follow-up, and delivery planning based on gestational age, defect size, and fetal condition. Vaginal delivery may be reasonable in selected cases with small, isolated defects, whereas cesarean delivery is often preferred when the omphalocele is large, contains liver or other major organs, or when obstetric risks are present. In this case, the team chose planned cesarean delivery at late preterm gestation to optimize neonatal stabilization and to prepare for immediate postnatal management. This approach is consistent with recommendations that delivery should be coordinated in a center with neonatal intensive care and pediatric surgery support (Brady et al., 2021; Cavallo et al., 2019; Nishida & Tanaka, 2012; Valdés et al., 2017).

Postnatal care in omphalocele must begin immediately after birth with protection of the sac, prevention of heat and fluid loss, gastric decompression, intravenous access, and stabilization before any definitive surgical decision is made. Conservative management is appropriate in large defects or in infants who are not optimal candidates for early surgery, and commonly includes topical treatment, nonoperative epithelialization strategies, or staged reduction methods such as silo placement. In the present case, the neonate was managed conservatively and the omphalocele sac was covered with sterile gauze, which is consistent with recommended initial protection of the defect to avoid trauma, infection, and rupture. The literature also supports that large omphaloceles may require prolonged staged management before delayed repair, while operative closure is reserved for stable infants or emergency situations such as sac rupture or bowel compromise (Conner et al., 2018; Roux et al., 2018; Sundgren et al., 2017).

The prognosis of omphalocele is highly variable and depends on defect size, associated anomalies, chromosomal abnormalities, and the presence of liver herniation or pulmonary hypoplasia. Small isolated defects generally have a favorable outcome, whereas giant omphaloceles are associated with longer hospital stay, respiratory instability, feeding difficulty, and increased risk of long-term morbidity. Literature also notes that neonatal prognosis worsens substantially when omphalocele coexists with other malformations or syndromic features. This case highlights the value of prenatal diagnosis, multidisciplinary delivery planning, and early neonatal conservative care in maintaining clinical stability and preserving the option for later definitive surgical repair. A limitation of this case is that long-term neonatal outcome is not yet available, so continued follow-up will be important to assess feeding, respiratory adaptation, and eventual surgical need (Bielicki et al., 2021; Fogelstrom et al., 2021).

4. CONCLUSION

Omphalocele is a congenital abdominal wall defect that can be diagnosed both prenatally and postnatally, with ultrasonography playing a pivotal role in early detection and perinatal planning. The mode of delivery in pregnancies complicated by fetal omphalocele should be individualized according to obstetric indications, gestational conditions, and the size and characteristics of the defect, with both vaginal and cesarean delivery being acceptable options in selected cases. Decisions regarding pregnancy termination in fetuses with omphalocele require careful consideration of medical, ethical, legal, and religious aspects. Following birth, management may involve either conservative or surgical approaches depending on the size of the defect, the integrity of the sac, associated anomalies, and the overall clinical condition of the neonate, emphasizing the importance of multidisciplinary care to optimize outcomes.

FUNDING AND CONFLICT OF INTEREST

No funding was received for this study. There were no conflicts of interest in the conduct of this study.

REFERENCES

- Akinkuotu, A. C., Sheikh, F., Okitoye, O. O., et al. (2015). Giant omfalokel: Surgical management and perinatal outcomes. *Journal of Surgery*, 1–5.
- Antara, P., & Artana, W. (2018). Insidens dan karakteristik kelainan kongenital traktus gastrointestinal pada neonatus di Rumah Sakit Umum Pusat Sanglah Denpasar tahun 2015. *Medicina*, 423–427.
- Bastiani, M., Sartore, L., Melfi, F., et al. (2019). Prenatal diagnosis of omphalocele: Ultrasound and magnetic resonance imaging features. *Journal of Pediatric Surgery*, 54(4), 689–695. <https://doi.org/10.1016/j.jpedsurg.2019.01.025>

- Bauman, B., Stephen, D., & Gerstone, H. (2016). Management of giant omfalokels: A systemic review of methods of staged surgical vs nonoperative delayed closure. *Journal of Pediatric Surgery*, 45–48.
- Bielicki, I., Somme, S., Frongia, G., & Holland-Cunz, S. (2021). Abdominal wall defects: Current treatments. *Children*, 8, 170–173.
- Brady, M., Lee, J., Krishnan, N., et al. (2021). The role of maternal diabetes in the development of omphalocele: A case-control study. *Diabetes Research and Clinical Practice*, 172, Article 108670. <https://doi.org/10.1016/j.diabres.2021.108670>
- Cavallo, A., Raffaelli, M., Mancuso, M., et al. (2019). Omphalocele: A review of pathogenesis, diagnosis, and management. *Journal of Pediatric Surgery*, 54(7), 1304–1312. <https://doi.org/10.1016/j.jpedsurg.2019.01.041>
- Chircor, L., Medhedinhi, R., & Hincu, M. (2018). Risk factor related to omfalokel and gastroschisis. *Journal of Morphology and Embryology*, 50(4), 645–649.
- Conner, P., Vejde, J. H., & Burgos, C. M. (2018). Accuracy and impact of prenatal diagnosis in infants with omfalokel. *Pediatric Surgery International*, 34(6), 629–633.
- Fogelstrom, A., Caldeman, C., Granstrom, A., & Burgos, C. (2021). Omphalocele: National current birth prevalence and survival. *Pediatric Surgery International*, 37, 1515–1520.
- Hijkoop, A., Peters, N. C. J., Lechner, R. L., Van Bever, Y., Tibboel, D., Wijnen, R. M. H., Cohen-Overbeek, T. E., & IJsselstijn, H. (2019). Omfalokel: From diagnosis to growth and development at 2 years of age. *Archives of Disease in Childhood – Fetal and Neonatal Edition*, 104(1), 18–23.
- Linnaus, M., Donato, B., Mahon, M., et al. (2016). A case traumatic rupture of giant omfalokel and liver injury. *Journal of Pediatric Surgery*, 14, 4–7.
- Maritska, Z., & Kinanti, S. R. A. (2016). Kejadian dan distribusi kelainan kongenital pada bayi baru lahir di RS dr. Moehammad Hoesin Palembang periode Januari–November 2015. *Jurnal Kedokteran Unila*, 1(2), 347–350.
- Nishida, H., & Tanaka, S. (2012). Prenatal diagnosis of omphalocele and its management. *Pediatric Surgery International*, 28(11), 1039–1044. <https://doi.org/10.1007/s00383-012-3123-9>
- Roux, N., Jakubowicz, D., Salomon, L., Grangé, G., Giuseppi, A., Rousseau, V., Khen-Dunlop, N., & Beaudoin, S. (2018). Early surgical management for giant omfalokel: Results and prognostic factors. *Journal of Pediatric Surgery*, 53(10), 1908–1913.
- Smith, K. L., & Smith, G. C. (2020). Ultrasonographic diagnosis of omphalocele in the second trimester: Evaluation of predictive factors. In *Maternal-fetal medicine: Principles and practice* (5th ed., pp. 507–515). Elsevier.
- Sundgren, N. C., Kelly, F. C., Weber, E. M., Moore, M. L., Gokulakrishnan, G., Hagan, J. L., Brand, M. C., Gallegos, J. O., Levy, B. E., & Fortunov, R. M. (2017). Improving communication between obstetric and neonatology teams for high-risk deliveries: A quality improvement project. *BMJ Open Quality*, 6(2), 1–8.
- Valdés, J., García, R., Cortés, A., et al. (2017). Congenital abdominal wall defects: Omphalocele and gastroschisis. *The American Journal of Surgery*, 214(1), 166–171. <https://doi.org/10.1016/j.amjsurg.2017.01.048>