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Case Report

# Omphalocele in newborns: What you need to know

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## Abstract

Omphalocele is a congenital abdominal wall defect in which the intestines, liver, or other abdominal organs protrude outside the body through the umbilical cord, enclosed in a thin membrane. This condition occurs due to incomplete closure of the abdominal wall during fetal development[1]. While the exact cause is not always known, genetic and environmental factors may play a role. Diagnosis is typically made through prenatal ultrasound, allowing for early intervention planning. Treatment involves surgical correction, which varies depending on the size of the defect and the overall health of the newborn. Advances in neonatal care and surgical techniques have significantly improved outcomes for affected infants. This article explores the causes, diagnosis, treatment options, and long-term prognosis of omphalocele, offering insights for medical professionals, parents, and caregivers.

**Keywords:** Omphalocele, Congenital abdominal wall defect, Neonatal surgery, Prenatal diagnosis.

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## 1. Introduction

As part of my clinical posting in Pediatric Nursing, I was posted in the Neonatal Intensive Care Unit (ward) of SKIMS Soura. I took a patient, namely, XYZ, bearing inpatient number 02889549, for my case study.(**Table 1**) This patient was admitted to the hospital on July 8th, 2023, and was diagnosed with "Omphalocele".[1-3]

## 2. Case Report

**Table 1:** Patient information

| | |
|---|---|
| **Name** | XYZ |
| **Father/Husband** | XYZ |
| **Address** | XYZ |
| **Patient ID** | 02889549 |
| **MRD No.** | 1389926 |
| **Sex** | Female |
| **Date/Time of Admission** | 06-07-23 / 10:37:16 PM |
| **Referred From** | Direct Admission |
| **Religion** | Islam |
| **Initial Diagnosis** | Omphalocele |

1. Chief complaints: Term child, first in birth order, female, referred from LD-hospital with the complaint of omphalocele at the time of delivery (LSCS - Lower Segment Cesarean Section).
2. History of Present Illness: The patient had a hernia of the cord containing small bowel. The umbilical stump was ligated at a distant place with visible two umbilical veins and a single umbilical artery.
3. Past medical history: Not significant.
4. Past surgical history: Not significant.
5. Birth history: Perinatal history: first in birth order, born full term at LD-hospital by LSCS. Birth weight was 2 kg.
6. General physical examination:
   i. Appearance: Pink
   ii. Tone: Moving all four limbs
   iii. Pallor: Absent
   iv. Cyanosis: Absent
   v. Edema: Absent
7. Vital signs:
   i. Respiratory rate: 56 breaths per minute (56/min)

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ii. Oxygen saturation (SpO2): 95%
iii. Heart rate: 132 beats per minute (132 bpm)

8. Anthropometric assessment:
   i. Height: 44 centimeters (44 cm)
   ii. Weight: 2 kilograms (2 kg)
   iii. Head Circumference: 31 centimeters (31 cm)
   iv. Mid-Arm Circumference: 11 centimeters (11 cm)
   v. Chest Circumference: 29 centimeters (29 cm)

9. Head-to-toe examination:
   i. Skin: Pink
   ii. Hair: Normal in color and texture
   iii. Nails: Normal in shape
   iv. Head and neck: Normal in size, shape, and symmetry. No palpable lymph nodes.
   v. Face: Normal
   vi. Ears and nose: Properly aligned, no deformities.
   vii. Mouth: Large tongue
   viii. Chest, thorax, and lungs: Symmetrical in shape and size.
   ix. Abdomen: Omphalocele

10. Systemic examination (Neurological):
   i. Normal suck
   ii. Normal activity
   iii. Tone normal

**Table 2**: Investigations

| **Hemogram** | |
|---|---|
| **Parameter** | **Result** |
| Hb | 19.2 |
| TLC | 18.4 |
| PLT | 338 |
| **KFT** | |
| **Parameter** | **Result** |
| Urea | 24 |
| Creatinine | 0.81 |
| **Serum Chemistry** | |
| Parameter | **Result** |
| Calcium | 9.31 |
| **LFT** | |
| Parameter | **Result** |
| Bilirubin | 204 |
| ALT | 9 |
| ALP | 153 |
| Protein | 5 |
| Albumin | 3.29 |

1. Description of the disease:

Omphalocele: A congenital birth defect that involves the umbilical cord itself, and the organs remain enclosed in the visceral peritoneum.

2. Risk Factors:
   i. Younger mothers (under 20 years old)
   ii. Folic acid deficiency
   iii. Hypoxia (lack of oxygen)
   iv. Consumption of salicylates, acetaminophen, ibuprofen and pseudoephedrine during pregnancy.
   v. Consumption of marijuana, cocaine and alcohol during pregnancy.
   vi. High-risk pregnancies, such as those complicated by infection or anything that contributes to low birth weight, can increase the incidence.

3. Incidence and etiology
   i. Omphalocele affects about 1 in 5,000 newborn babies.

4. Pathophysiology:
   i. An omphalocele is caused by an error in the embryonic development of the intestinal tract. During normal development of the embryo, there are initially three distinct portions of the intestinal tract - the foregut, midgut, and hindgut - that extend through the length of the embryo. Much of the midgut is temporarily herniated outside the abdomen at the umbilicus. The midgut later re-enters the abdomen and the opening in the abdominal wall closes. The error responsible for an omphalocele is the failure of the midgut to return and re-enter the abdomen.[4]

**Table 3:** Clinical Features:

| **Book Picture** | **Patient Picture** |
|---|---|
| In an omphalocele, the diameter of the abdominal wall defect is 4-12cm; it may be centrally located or in the epigastric or hypogastric region<br>With a large omphalocele, dystocia may occur and result in injury to the baby's liver<br>The omphalocele sac ruptures in 10-20% of cases. Rupture can occur in utero (before birth) or during delivery.<br>Babies with giant omphaloceles have large, centrally located abdominal defects. The liver is often located outside the abdominal cavity, within the sac. | Hernia of cord containing small bowel<br>Centrally located |

1. Diagnostic evaluation:
   i. Elevated maternal serum alpha-fetoprotein (MSAFP): Elevated MSAFP levels in the mother's blood are associated with omphalocele.
   ii. Prenatal Ultrasonography

iii. Amniocentesis: Amniocentesis is used to monitor lung maturity and determine when to induce labor.

2. Management (According to the Book):

i. Neonates with intact omphaloceles are usually in no distress unless associated pulmonary hypoplasia is present.
ii. The baby should be carefully examined to detect any associated problems such as Beckwith-Wiedemann Syndrome, chromosomal abnormalities, and congenital heart disease.[7]
iii. Maintenance intravenous (IV) fluids are administered.
iv. The omphalocele sac is covered with a non-adherent dressing to preserve body heat and moisture.
v. Prophylactic antibiotic may be given preoperatively.
vi. Closure of a small or moderate-sized omphalocele is accomplished without difficulty.[8]
vii. A baby with a ruptured omphalocele is treated the same way as a baby with gastroschisis.
viii. Closure of giant omphaloceles containing the liver is challenging.

3. Treatment given to the patient:

i. Inj D10% @ 60ml/kg/day
ii. Inj Vit K 1mg WOS (stat)
iii. Inj Cefotaxime 50mg/kg

4. Surgical care (According to Book):

Omphalocele may be treated by mobilizing skin flaps to cover the omphalocele skin. A circumferential incision is made along the skin omphalocele junction keeping the omphalocele membrane intact. The incision is extended to the midline and the rectus fascia is exposed from the xiphoid to pubis. Teflon sheets are inserted along the edge of the fascia and approximated over the omphalocele sac.[5]

Reduction is affected by gradually pulling the Teflon sheets and attached rectus muscles over the liver and suturing them in the midline. At an appropriate time, Teflon sheets are removed, the omphalocele sac is excised and a dual mesh patch (Gore-Tex) is sutured circumferentially to the remaining fascia defect.[6]

5. Surgical Case (given to patient):

Reduction of Omphalocele under sedation.

**Table 4**: Drug chart

| Name of the Drug | Pharmacological Action | Dosage/Route | Indication | Contraindication | Side Effects | Nurses Responsibility |
|---|---|---|---|---|---|---|
| Vitamin K | Corrects PT in patient with Cirrhosis to correct Coagulopathy | 1mg/IV | Hepatic Failure, Vitamin K Deficiency, Cystic Fibrosis | Renal Impairment, Hypersensitivity | Skin Rash | Check for Hypersensitivity |
| Cefotaxime | Works by stopping the growth of bacteria | 50mg/IV | Bacterial Infections, Pre-Surgeries | Hypersensitivity | Swelling, Redness, Pain | Check for Hypersensitivity |

**Table 5:** Nursing care plan

| Nursing Diagnosis | Objective | Nursing Interventions | Evaluation |
|---|---|---|---|
| 1. Pain in Abdomen related to Omphalocele as evidenced by intense crying | Reduce the pain level | Assessed the level of pain<br>Consulted and coordinated with health care team members. Administered medications prescribed by the doctors | Pain was reduced to a certain level |
| 2. Imbalanced nutrition: less than the body requirements related to disease condition as evidenced by decreased body weight. | Maintain normal body weight | Monitored the weight of the newborn. Monitored vital signs.<br>Checked serum glucose regularly.<br>Provided adequate feed to the baby | Normal body weight was maintained |
| 3.Risk of infection related to surgery and low community | To prevent infection | Assessed the surgical site and reported any pus formation.<br>Administered antibiotics as per physician's order | Infection was prevented |
| Risk of imbalanced fluid and electrolyte level related to the disease condition | To prevent fluid and electrolyte losses | Administered IV D10% @ 60ml/kg/day | Fluid and electrolyte balances were maintained |

1. Health education to parents:
   i. Diet: Advised the parents to provide breastfeeding exclusively for 6 months and after that weaning should be started in addition to breastfeeding. Advised them to meet any specialists that the doctor recommends e.g. a dietitian or a genetic counselor.
   ii. Rest: Explained the parents about the importance of adequate rest and sleep to the patient.
   iii. Prevention of infection: Told them about wound care before taking their baby home so that the baby can heal well.
   iv. Advised to go to all follow-up visits with the surgeon.
   v. Encouraged routine pediatric check-ups
   vi. Educated about potential long-term concerns (GI issues, hernias, etc.).
   vii. Offered support groups, counseling referrals.
   viii. Encouraged bonding activities like talking to the baby, skin-to-skin when appropriate.

## 3. Discussion

Omphalocele is a congenital abdominal wall defect with significant clinical implications, requiring a multidisciplinary approach for optimal management. This study highlights the importance of early diagnosis, prenatal counseling, and individualized treatment strategies to improve neonatal outcomes. Our findings align with existing literature, emphasizing the role of antenatal imaging in detecting omphalocele and associated anomalies, which are critical in determining prognosis and guiding parental decision-making.

The management of omphalocele varies depending on the size of the defect, the presence of associated anomalies, and the overall health of the neonate. For small omphaloceles, primary closure is often feasible with favorable outcomes. However, giant omphaloceles pose greater challenges due to the risk of respiratory compromise, abdominal compartment syndrome, and infection. In such cases, staged repair or conservative management with delayed closure can lead to improved survival rates while minimizing surgical complications.

## 4. Conclusion

As a part of my clinical posting in SKIMS, I came across B/O XYZ who has been diagnosed with Omphalocele. Took the patient for my case study and provided comprehensive nursing care by the application of nursing process.

1. Novelty
   i. Interdisciplinary Collaboration: The nursing team collaborated effectively with surgeons, neonatologists, and in a way that improved outcomes.
   ii. Education and Family Support Focus: Novel strategies for educating the family or preparing them for long-term care needs.

2. Limitations
   i. This report describes a single case.
   ii. Educational case report not research one.
   iii. Lack of long term follow up.
   iv. Some nursing assessments and educational impacts rely on subjective observations, which may introduce bias.
   v. The report focuses on basic nursing care and education, without exploring advanced or specialized interventions in depth.
   vi. The case was managed in a specific healthcare setting, which may differ significantly from other institutions in terms of resources, staff training, and protocols.
   vii. The high level of parental involvement in this case may not be replicable in all clinical contexts, affecting the applicability of the educational model used.
   viii. There is no comparison with standard care or other cases, limiting the ability to assess the effectiveness of the educational strategies implemented.

## 5. Source of Funding

None.

## 6. Conflict of Interest

None.

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