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THE ROLE OF NURSING ASSESSMENT IN DIAGNOSING INTESTINAL MALROTATION: A CASE REPORT

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ABSTRACT

Intestinal malrotation is a congenital anomaly of the gastrointestinal tract that is most commonly diagnosed during the neonatal period. Delayed presentation beyond infancy is uncommon and may result in significant diagnostic challenges, particularly in children with complex genetic disorders. This case describes a 4-year-old girl with Edwards syndrome (Trisomy 18) whose atypical presentation of intestinal malrotation created a demanding clinical situation for the multidisciplinary healthcare team.

The patient was admitted to the pediatric surgical department with coffee-ground vomiting and a one-week history of constipation. Due to severe developmental impairment and limited communication abilities associated with her genetic condition, the assessment of symptoms relied heavily on careful clinical observation. The nursing team played a crucial role in the diagnostic process through comprehensive assessment, including pain evaluation using the FLACC scale, continuous monitoring of vital signs, and detailed observation of the frequency and characteristics of emesis. These findings raised suspicion of a high-level intestinal obstruction and prompted further diagnostic investigations.

Although the initial abdominal X-ray suggested a diaphragmatic hernia, surgical exploration revealed intestinal malrotation with volvulus consistent with Ladd's syndrome. This case highlights the importance of advanced nursing assessment, clinical vigilance, and interdisciplinary collaboration in recognizing rare surgical emergencies and ensuring patient safety in children with significant communication barriers and complex healthcare needs.

KEYWORDS

Nursing Assessment, Pediatric Nursing, Intestinal Malrotation, Edwards Syndrome

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Introduction

Congenital anomalies of the fetus are defined as any pathologies that develop during pregnancy (including biochemical, anatomical, or molecular abnormalities). Congenital anomalies affect 2–5% of all newborns [1,2]. Gastrointestinal congenital anomalies account for 5–6% of all reported anomalies and can involve any segment of the digestive tract [3]. Many congenital anomalies can be detected prenatally through appropriate examinations.

One of the congenital gastrointestinal anomalies is intestinal malrotation, a developmental disorder of the intestine occurring during the early phase of gut development, between the 5th and 10th week of gestation, when the first 90-degree rotation of the intestine takes place. Anatomically, it is characterized by a very narrow mesenteric attachment to the posterior abdominal wall and the presence of Ladd's bands, which abnormally fix the cecum and colon [4]. Ladd's bands may pass over the duodenum, causing compression and ischemia, which can lead to high intestinal obstruction [6,7]. Diagnosis of intestinal malrotation can be made during fetal ultrasonography in the third trimester of pregnancy [10,11].

In the literature more than 90% of cases are diagnosed before the age of 1, many within the first days of life [5]. The literature describes single cases of malrotation diagnosed only in children who were only a few years old.

In children with Edwards syndrome, who often present with multiple anatomical variations and complex comorbidities, diagnosing additional gastrointestinal defects is exceptionally difficult [8,9]. The nursing team's responsibility involves not only technical care but also "clinical surveillance" - the continuous process of detecting subtle physiological deterioration in non-verbal patients.

Methodology

This case report presents a 4-year-old girl with Edwards syndrome who presented to the emergency department with five days of vomiting after each attempt at oral intake. She had a single fever episode of 38.5°C at night. The patient was under hospice care, taking no regular medications and had no known allergies. She had not passed stool for one week prior to presentation. During physical examination, a distended abdomen was observed. There is no information about the medical condition of the child's parents.

Upon admission, the nursing team performed a systematic assessment and identified several priority Nursing Diagnoses (NANDA-I):

Deficient Fluid Volume related to persistent vomiting and inability to tolerate oral intake, evidenced by decreased skin turgor and dry mucous membranes.

Acute Pain related to intestinal compression, evidenced by irritability and a FLACC score of 7/10.

Ineffective Gastrointestinal Tissue Perfusion related to suspected mechanical obstruction and risk of volvulus.

Abdominal ultrasound was limited due to excessive bowel gas but showed a single dilated bowel loop in the left mid-abdomen, 3.5 cm in diameter, with preserved wall thickness and peristalsis. Additionally, the bladder was displaced to the right, with a large volume (~55 ml; 40 ml post-void), smooth-walled, and containing significant urine sediment. A trace of free fluid was noted in the right lower abdomen.

An upright abdominal and chest X-ray revealed dilated bowel loops up to 40 mm with air–fluid levels in the right hemithorax, upper abdomen, and mid-abdomen, with little gas in the pelvis, suggesting a right-sided diaphragmatic hernia with intestinal obstruction.

The nursing team undertook a series of clinical interventions aimed at stabilizing the patient and preparing her for definitive treatment.

During the initial clinical assessment, the nursing staff observed that the patient's emesis was "coffee-ground" in nature, a finding suggestive of high gastrointestinal obstruction, prolonged gastric stasis, or possible mucosal ischemia. Based on this observation, the nursing team immediately implemented a "Nil Per Os" (NPO) regimen and inserted a nasogastric tube (NGT) for gastric decompression. Continuous monitoring of the gastric output was performed, revealing bile-stained and coffee-ground fluid [12]. These findings were documented in the patient's medical records and promptly communicated to the surgical team, contributing to the clinical suspicion of an acute mechanical intestinal obstruction and guiding further diagnostic and therapeutic management.

Due to the patient's genetic syndrome and history of multiple hospitalizations, peripheral venous access was severely compromised. The nursing team implemented a specialized venous access protocol, successfully securing a line to allow for the urgent administration of intravenous fluids and preoperative antibiotics, preventing a delay in surgical intervention.

Results

The patient underwent surgery. A laparotomy was performed to resolve the intestinal obstruction and repair the diaphragmatic hernia.

Through a transverse upper abdominal incision, the abdominal cavity was opened. A right-sided diaphragmatic hernia with entrapped bowel loops was identified. The bowel and greater omentum were gently reduced into the abdominal cavity. A defect in the left diaphragm was also identified and repaired similarly.

Intraoperatively, intestinal malrotation with obstructing Ladd’s bands causing duodenal obstruction was discovered. The Ladd’s bands were divided, confirming the diagnosis of Ladd’s syndrome. The surgery was successful, without any complications and the previously mentioned symptoms disappeared.

Postoperatively, the patient remained under close nursing surveillance. Monitoring focused on the return of gastrointestinal function, including observation for the first postoperative stool. Given the increased risk of impaired wound healing associated with Trisomy 18, advanced wound dressings were used to reduce the risk of surgical site infection (SSI). Nutritional rehabilitation consisted of a gradual nurse-led reintroduction of oral fluids, with close monitoring for recurrent vomiting or abdominal distension [16].

Pain assessment was performed using the FLACC Behavioral Scale (Face, Legs, Activity, Cry, Consolability) because the patient was non-verbal [15,19]. This facilitated appropriate adjustment of analgesic therapy. Fluid and electrolyte balance were monitored through assessment of mucous membrane moisture, skin turgor, and hourly urine output measurements (UOP) [13]. No postoperative complications were observed, and the patient's symptoms resolved completely.

Table 1. Timeline of Clinical Events and Nursing Interventions.

Phase	Clinical Status	Nursing Interventions
Admission (ED)	Persistent vomiting after oral intake; no bowel movement for 7 days.	Assessment of dehydration status; securing peripheral venous access (challenging access protocol).
Critical Observation	Onset of "coffee-ground" emesis (indicative of stasis or ischemia).	Immediate "*Nil Per Os"* (NPO) status; nasogastric tube (NGT) insertion for decompression; reporting "red flag" symptoms to the surgical team.
Pre-operative	Radiographic (X-ray) suspicion of intestinal obstruction and diaphragmatic hernia.	Preparation for emergency laparotomy; administration of preoperative prophylactic antibiotics.
Post-operative	Clinical stabilization following surgical division of Ladd's bands.	Monitoring for return of peristalsis (bowel sounds/stool); hourly urine output (UOP) measurement.

Discussion

The clinical significance of this case lies in the exceptional age of the patient and the complexity of the coexisting genetic pathology. While intestinal malrotation and Ladd's syndrome are classic neonatal emergencies—with over 90% of cases diagnosed in infancy—late-onset presentations in preschool-aged children are considered casuistic and present a significant diagnostic challenge [17]. In the context of Edwards syndrome (Trisomy 18), where multi-organ anatomical variations are the norm, the risk of "diagnostic overshadowing" is high [9,18].

This case highlights the role of interdisciplinary care and the efficient functioning of the medical team. In this case, the nursing team acted as a vital "clinical bridge" between the patient's non-verbal cues and the definitive surgical diagnosis. Patients with Edwards syndrome often present with severe developmental delays and communication barriers, rendering traditional pain scales and subjective history-taking ineffective. The use of the FLACC Behavioral Scale was not merely a routine task but a critical diagnostic intervention that quantified the patient's distress, signaling an acute intra-abdominal process that physical examination alone could not fully capture [20].

A pivotal moment in the diagnostic-care process was the nurse's identification, interpretation of "Red Flags" and documentation of "coffee-ground" emesis. While initial imaging (X-ray) pointed toward a diaphragmatic hernia, the nursing observation of gastric content suggested a more proximal, high-level obstruction or mucosal ischemia—pathophysiological hallmarks of Ladd's bands.

By implementing an immediate "Nil Per Os" (NPO) status and nasogastric decompression before the surgical consult was finalized, the nursing staff exercised clinical autonomy [14,21]. This proactive stance likely prevented further aspiration and reduced intraluminal pressure, optimizing the patient for emergency surgery.

The successful outcome also hinged on the nursing team's technical expertise in managing the "difficult patient" profile. Securing peripheral venous access in a child with a history of chronic hospitalizations and systemic fragility is a common challenge in pediatric emergencies. The implementation of a specialized venous access protocol ensured that fluid resuscitation and preoperative antibiotics were administered without delay, directly impacting the surgical prognosis.

Finally, this case highlights the role of nurses in clinical supervision and patient safety. Also underscores the concept of "nursing vigilance" as a safety net. In children with complex disabilities, the primary diagnosis often "masks" secondary acute conditions. The nursing team's ability to look beyond the known genetic syndrome and the initial X-ray findings allowed for a broader differential diagnosis. This level of surveillance is essential in pediatric surgery, where the window between "stable" and "critical" is notoriously small [17].

Conclusions

The clinical insights derived from this case underscore the absolute necessity for healthcare providers, particularly nursing teams, to maintain a permanently high index of suspicion for late-onset intestinal malrotation and Ladd's syndrome in any pediatric patient presenting with bile-stained or coffee-ground emesis, completely irrespective of the patient's age. In the clinical management of children with profound, multi-organ genetic disabilities such as Edwards syndrome, advanced holistic monitoring is paramount; clinicians must actively look beyond the manifestations of the primary congenital syndrome to successfully identify secondary, acute surgical emergencies that routinely present with highly atypical or masked symptomatology. Ultimately, this case proves that precise, continuous nursing documentation of emesis characteristics, volume, and objective behavioral pain metrics serves as a powerful instrument for patient advocacy. By providing the interdisciplinary team with rapid, quantifiable data, these specialized nursing assessments effectively eliminate diagnostic delays, prevent the risks of diagnostic overshadowing, and significantly shorten the timeline to life-saving surgical intervention.

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