Unraveling Pediatric Constipation: A Biopsychosocial Approach Toward a 2-year-old's Chronic Gastrointestinal Quandary

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Abstract

INTRODUCTION: This case report unfolds the diagnostic and therapeutic journey of a 2-year-old girl with chronic constipation unresponsive to conventional laxatives, hinting at a possible underlying organic pathology amidst a complex familial and personal medical background.

METHODS: Utilizing a biopsychosocial model, a comprehensive assessment was conducted to delineate the predisposing, precipitating, perpetuating, and protective factors affecting the patient's gastrointestinal health. A multidisciplinary approach was employed to craft a tailored management plan involving the patient and her parents.

RESULTS: The application of the biopsychosocial model unveiled an intricate interplay of biological, psychological, and social factors contributing to the patient's persistent constipation. The multidisciplinary approach fostered a nuanced understanding and a patient-centered management plan, addressing not only the gastrointestinal symptoms but also the broader health and well-being of the child and her family.

DISCUSSION: The case accentuates the essentiality of transcending traditional biological examinations, embracing a holistic, patient-centered, biopsychosocial model, especially in pediatric patients with complex medical and familial backgrounds. It also underscores the need for an integrated, multidisciplinary approach for effective diagnosis and management in complex pediatric gastroenterological cases.

CONCLUSION: The case elucidates the paramountcy of a multidisciplinary, biopsychosocial approach in navigating complex pediatric gastroenterological cases, fostering an enriched discourse on patient-centered care and enhancing long-term health outcomes.

Case Background

This case outlines the diagnostic and therapeutic trajectory for a 2-year-old girl experiencing persistent constipation, unresponsive to conventional laxative regimens, suggesting a potential underlying organic pathology[1]. A familial history of Von Willebrand's Disease (VWD) and Cystic Fibrosis (CF), coupled with the patient's mild right-sided hemiplegia suspected to be cerebral palsy, enhances the clinical narrative. While chronic constipation in pediatrics often ameliorates with dietary and pharmacological interventions, this case underscores a subset resisting such standard remedies, necessitating a more nuanced diagnostic approach[2]. By exploring the predisposing, precipitating, perpetuating,

https://doi.org/10.33178.SMJ.2024.1.7

and protecting factors through a biopsychosocial lens, this case illuminates a nuanced, patient-centric approach towards managing chronic constipation in pediatric patients, especially amidst a complex medical and familial milieu[3-4].

Case Details

PRESENTING COMPLAINT:

A 2-year-old girl presented 3 days ago with a 5/7 history of abdominal pain, distention, one time vomiting of feces, and straining during defecation with infrequent bowel movements, leading to significant discomfort and interrupted sleep.

The history of her presenting complaint involved 5 weeks of disimpaction protocol with 8 sachets of Movicol and 20 mL of Lactulose twice daily, which had no effect. Multiple laxatives and enemas were attempted without success. Her last stool was 4 days prior to presentation. Her background included a 22-month history of intermittent constipation, where she would have recurring 3-5 days of straining defecation with large hard balls with large streaks of blood on them, followed by 5-7 days of no bowel motion at all (i.e., impaction).

FAMILY HISTORY (FAMILY OF ORIGIN):

The family history reveals VWD Type I in the patient's mother and sister, CF in a cousin, and hip dysplasia in her father. The patient herself has tested positive for VWD prior to a rectal biopsy.

PERSONAL HISTORY:

The patient had a birth history of 36/40 induction of labor, delayed passage of meconium to Day 2/3, and jaundice in the neonatal period without requiring phototherapy. She had been living in a well-structured family environment but with a high-dairy, low-fiber/ protein diet primarily comprising white pasta, rice, and pizza. Her father was a smoker and smoked outside of the house.

PAST MEDICAL/ SURGICAL HISTORY:

The patient had a background of mild and improving right-sided hypertonia weakness with brisk reflexes, and a left hand preference secondary to suspected cerebral palsy. The patient's medical history is notably devoid of any invasive diagnostic or therapeutic procedures, including endoscopic evaluations or surgical interventions.

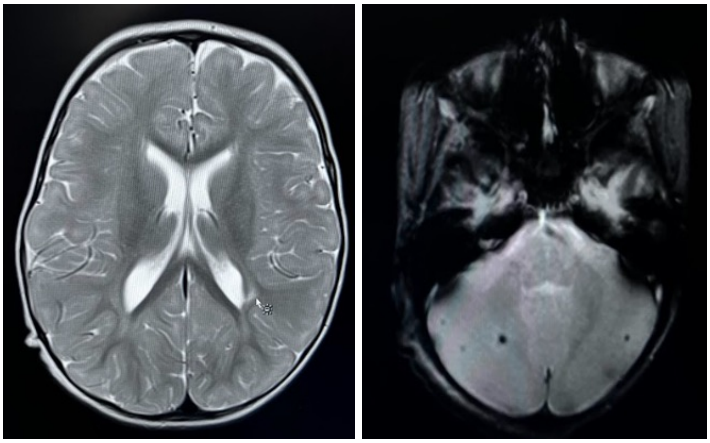

Figure 1/2: MRI Brain with Sedation

Findings: Overall myelination was appropriate.
Increased T2 signal noted in the left prior trigone territory involving the white matter. There was associated volume loss with tenting of the adjacent posterior horn lateral ventricle. There are six small foci of susceptibility artifacts in the posterior fossa. Small cortical focus of susceptibility artifact present in the right vertex.

Impression: There was evidence of left periventricular leukomalacia (PVL). Small foci of susceptibility artifact present consistent with microhemorrhages. Attribution to maternal production of antiplatelet antibodies at birth was ruled out by hematology.

PREMORBID HISTORY:

The patient was non-verbal but had manifested sounds indicative of her preferences. She was fully dependent on her caregivers for daily living activities. Unsuccessful attempts had been made to toilet train her.

The parents reported that the patient spent a significant portion of her time in her buggy or chair and received primary care physiotherapy. Her Gross Motor Function Classification System was 2. She was motivated to move by playing with her sister. Both parents were obese and lived a sedentary lifestyle. The parents were highly motivated to adopt a more balanced diet with fibrous foods and vegetables in their household.

Clinical Findings and Diagnosic Assessment

PHYSICAL EXAMINATION:

The patient, a 2-year-old girl, appeared active but irritable during the examination, likely secondary to abdominal discomfort. She was well-nourished, weighing

13.85 kg (between the 75th and 91st percentile) and a height of 85 cm (between the 9th-25th percentile). The patient was alert, oriented, and responsive to her name, though visibly uncomfortable. The abdomen was distended and hard on palpation. Bowel sounds were not assessed due to the patient's irritability and discomfort preventing complete examination, however loud gurgling and bowel sounds were reported by the parents. No scars, masses, or hernias were observed. The patient ambulated on her bum and knees, and demonstrated the ability to pull herself up onto a low bed.

IMAGING:

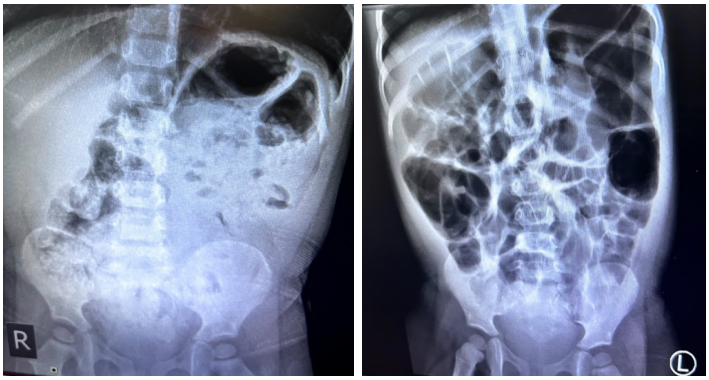

Figure 3/4:
(Left) The plain film abdomen (PFA) upon admission displayed pronounced fecal loading.

(Right) The empty PFA was acquired on the final day of hospitalization following a comprehensive disimpaction procedure.

PFA was prompted by the patient's complaint of abdominal discomfort and to confirm disimpaction efficacy. The investigation revealed that the reported discomfort could be attributed to gas production resulting from lactulose administration.

MANAGEMENT:

The disimpaction protocol included oral Lactulose (30mL initially, 20mL later twice daily), Phosphate Enema on admission (60mL), and Movicol Paed (8 sachets/day until clearout achieved). Picolax (2mg/kg once on admission) was attempted in desperation, albeit unsuccessfully.

Following disimpaction, the maintenance regime consisted of Microlax Enema (5mL) as needed, Movicol Paed (2 sachets) as needed, Dulcolax (3-5mg) twice weekly, and Paracetamol (15mg/kg) as needed. Patient was readmitted twice for further disimpaction. Patient currently refuses oral intake of Movicol and is now allowed a Nasogastric (NG) tube for administration of 8 sachets/day. Recent CF screening test using a heel prick was negative. Recent hip x-ray was normal. Patient awaits a Barium Enema procedure (CUH) and rectal biopsy (Crumlin Hospital) for suspected Hirschsprung's disease. Patient is awaiting surgical consultation as 2-day meconium suggested bowel motility and/or structural impairment.

Differential Diagnosis

1. Hirschsprung's Disease (HD)[5,6]
2. Chronic Functional Constipation (CFC)[6,7]
3. Medical causes e.g. Hypercalcaemia, Hypothyroidism, Renal Tubular Acidosis, Pyruvate Dehydrogenase Deficiency (PDD) [8-11] complicated by constipation
4. Cystic Fibrosis[12]
5. Von Willebrand Disease[13]
6. Anal stenosis[14]

Discussion

This case highlights the necessity of a multidisciplinary approach in addressing chronic pediatric constipation, especially when resistant to standard treatments. Utilizing a biopsychosocial formulation model, it delves into the intertwined factors affecting the patient's condition[3,4]. Despite the challenge posed by the child's irritability during examination, the case stresses the importance of an integrated care plan. This includes collaboration among pediatric generalists, pediatric surgeons, gastroenterology nurse-led resources like www.eric.org.uk and a poo passport, disability specialists, hematologists, physiotherapists, dietitians, and parents[1,2,15].

Addressing dietary habits, fostering an active lifestyle, and providing family education are also critical to improve the quality of life for the patient and her family.

Conclusion

This case underscores the paramountcy of a multidisciplinary, biopsychosocial approach in unraveling and managing complex pediatric constipation. It accentuates the necessity of transcending conventional pharmacological interventions to encompass a holistic understanding of the patient's biological, psychological, and social realms, thereby fostering a more efficacious, patient-centered management paradigm.

ETHICS APPROVAL:

Written informed consent for the case report was obtained from the patient's guardians.

CONFLICT OF INTEREST:

No conflict of interest to declare.

Acknowledgements

Dr. Frances Enright, Anthony Goodings, Mpho Mthethwa, Ahmad Albakri, Munsa Kang and Sophie Dunn

GUARANTOR: Sten Kajitani

Table 1: This table elucidates the interplay of biological, psychological, and social factors across predisposing, precipitating, perpetuating, and protective dimensions, offering a comprehensive biopsychosocial formulation of the patient's chronic constipation..

Factor Type	Biological	Psychological	Social
Predisposing	• Family history of Cystic Fibrosis • History of mild hemiplegia secondary to suspected cerebral palsy or PVL. • Delayed passage of meconium	• Early onset of constipation potentially impacting emotional response to discomfort and treatment.	• Possible Family preferences for a sedentary lifestyle • Father was a current smoker; chemicals from cigarette smoke absorb to clothes / skin / hair
Precipitating	• High dairy, low fiber/protein diet contributing to onset of constipation.	• Possible withholding secondary to anal tears and this will delay toilet training.	• Patient’s non-verbal cues leading to miscommunication for when she needs to defecate; parents mistook withholding behavior as straining
Perpetuating	• Resistance to first-line laxatives prolonging the constipation.	• Ongoing discomfort and sleep interruptions affecting the patient’s desire to move and play	• Unfamiliar environment in the hospital, disrupting routine
Protecting	• Up to date on all vaccinations. • Access to medical care and medications.	• Family support and willingness to seek medical care.	• Play with sister • Parents motivated to improve household diet

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