

An unusual presentation of gastrointestinal obstruction in a three-year-old boy

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We report a case presenting with severe intermittent intestinal obstruction, most probably due to enteric nervous system abnormality associated with megacystis and micturition difficulty. Medical treatment consisting of pyridostigmine was very successful in our patient. The clinicopathologic features of this very rare entity and its medical treatment are discussed with a brief review of the etiopathogenesis.

Key words: intestinal pseudoobstruction, autonomic neuropathy, visceral.

The enteric nervous system plays a crucial role in the control of gastrointestinal functions. Abnormalities of the enteric nervous system may be caused by inflammatory, infectious, metabolic and neurological diseases and can result in a wide spectrum of gastrointestinal dysmotility ranging from diarrhea and/or constipation to severe intestinal obstruction. These abnormalities may be associated with other system pathologies, mainly involving the urinary tract¹.

Herein, we report a case presenting with severe intermittent intestinal obstruction most probably due to enteric nervous system abnormality associated with megacystis and micturition difficulty. The clinicopathologic features of this very rare entity are discussed with a brief differential diagnosis.

Case Report

A three-year-old boy was admitted to the Department of Pediatric Surgery of Hacettepe University Medical Faculty with abdominal distension and micturition difficulty. The child was born to a 27-year-old mother, by cesarian section, at 34 weeks' gestation. Parents were second cousins. Antenatal history revealed the presence of megacystis by ultrasonography done at 28 weeks of gestation.

Previously, he had been investigated since day 2 at other centers because of abdominal distension. He passed his meconium on

postpartum day 4. Imaging studies done in the newborn period (voiding cystography, barium-colon radiography) revealed megacystis without reflux and microcolon with redundant sigmoid. As he defecated and voided spontaneously at the age of three weeks without any surgical intervention, he was discharged. He was readmitted at the age of six months with vomiting, abdominal distension and micturition difficulties. Imaging studies done in this period revealed megacystis and suspected transitional zone resembling ultrashort Hirschsprung's disease. Based on these findings and anorectal manometry revealing negative rectoanal inhibitory reflex index, posterior myectomy was performed. However, no evidence of ganglion cell abnormalities was encountered on histopathologic examination. He was discharged on clean intermittent catheterization and a variety of laxatives.

Physical examination at the final presentation revealed a massively distended abdomen. He had not passed stool or urine for the last five days and 24 hours, respectively. Urinary bladder catheterization and nasogastric decompression was done after admission. Total parenteral nutrition was started with clean intermittent catheterization six times daily. Laboratory tests including complete blood count and liver-renal and thyroid function tests were normal. Imaging studies of the upper gastrointestinal system (Fig. 1), colon (Fig. 2) and urinary

tract (Fig. 3) revealed distended stomach, megacystis and redundant sigmoid. Urodynamic study revealed hypotonic bladder with increased capacity, and scintigraphic study revealed that gastric emptying time was increased.



Fig. 1. Upper gastrointestinal study revealing delayed gastric emptying.

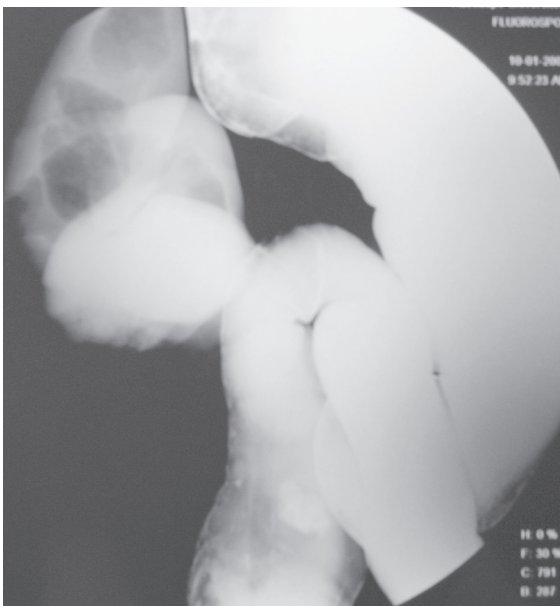


Fig. 2. Barium-colon radiography showing redundant sigmoid colon.



Fig. 3. Voiding cystography revealing neurogenic bladder without reflux.

Neurological studies consisting of electromyography (sympathic skin reflex), heart rate variability and clonidine eye test were performed. Sympathic skin reflex showed sympathetic system dysfunction but other neurologic tests were normal. Serum thymidine phosphorylase activity to screen for mitochondrial neurogastrointestinal encephalomyopathy syndrome (MNGIE) was not suggestive of this disorder.

After excluding any type of mechanical obstruction and based on possible autonomic involvement, pyridostigmine (30 mg/kg/day) was commenced. A dramatic decrease in nasogastric decompression was noticed and the patient could be fed orally 21 days after admission. He started to defecate by oral laxatives 20 days after admission.

When he was discharged after 32 days, he was feeding well and passing stool by oral laxatives every day. At the six-month follow-up, he was still on pyridostigmine treatment at a dosage of 4x30 mg/day. He did not require urinary catheterization, and is on a mild dosage of laxatives with no abdominal distension.

Discussion

The present case illustrates the occurrence of severe gastrointestinal dysmotility and micturition difficulty, which can start from the antenatal

period to three years of age. There were no satisfactory explanations despite extensive clinical, neurological and radiological investigations.

When we searched the surgical literature, we noticed that the term “pseudoobstruction” had been used very often for these types of cases. However, after the introduction of high technology imaging and histopathological studies, the underlying pathologies of pseudoobstruction were mostly clarified and the term started to lose its popularity. We would like to discuss the present case within the differential diagnosis of autonomic neuropathies, mitochondrial pathologies and dysmotility disorders.

Gastrointestinal motility is controlled by various mechanisms, including the intrinsic nervous system and central nervous system². Hereditary sensory and autonomic neuropathies (HSAN) are a group of rare disorders classified into several subgroups. HSAN 3 is a rare, recessively inherited neuropathy with onset in infancy. Patients have absent fungiform papillae of the tongue and defective lacrimation, temperature, sweating, and blood pressure. Gastrointestinal symptoms are prominent in infancy and in early childhood^{3,4}. Although this condition may resemble our patient, other clinical symptoms were lacking.

Mitochondrial neurogastrointestinal encephalomyopathy syndrome (MNGIE) is an autosomal recessive disease caused by mutations in the gene encoding thymidine phosphorylase. MNGIE is clinically characterized by progressive external ophthalmoplegia, severe gastrointestinal dysmotility, episodic abdominal pain, cachexia, peripheral neuropathy, and diffuse leukoencephalopathy⁵. We excluded this entity in the current case.

Megacystis microcolon intestinal hypoperistalsis syndrome is a rare, congenital, and generally fatal cause of intestinal obstruction in the newborn. It is characterized by abdominal distension, caused by a distended, non-obstructed urinary bladder, a microcolon and decreased or absent intestinal peristalsis. Several etiopathogenetic mechanisms are defined. Examples include autonomic inhibitory input decrease and excessive smooth muscle cell glycogen storage with severely reduced contractile fibers, suggesting a fundamental defect of glycogen-energy utilization^{6,7}. However, we could only show a redundant sigmoid colon on radiological examination, thus excluding this syndrome.

Visceral autonomic neuropathy is a rare, poorly understood, heterogeneous disorder. It may occur as a primary disease or may be secondary to a systemic disorder (i.e. muscular dystrophies, connective tissue disorders, endocrine and infiltrative diseases). The most frequent symptoms are vomiting, abdominal distension, pain, constipation, weight loss, and diarrhea. Extraintestinal abnormalities may also occur (i.e. megacystis, mega-urethra, recurrent urinary tract infection)⁴. Treatment consists of nutritional support, drug treatment, and supportive surgical procedures^{1,2}.

Do we refer to this case as ‘chronic intestinal pseudoobstruction’? If yes, there are some limitations. First, we were not able to show a specific pathology, either myopathic or neuropathic, on histologic examinations. Second, we could not show the cause; is it due to autonomic neuropathy or idiopathic? The interesting point in our case is the sympathetic system dysfunction and the good response to the pyridostigmine treatment. In the literature, visceral autonomic neuropathy and its medical treatment are not well defined. Acetyl cholinesterase inhibitors have been tried for a minority of acute intestinal pseudoobstructive symptoms, but the pathogenesis is not well understood. They have been shown to stimulate peristalsis in patients with intestinal pseudoobstruction, but are also shown to be disappointing in some clinical uses⁸⁻¹⁰. Pyridostigmine has also been highlighted as being very effective in the treatment of neurogenic orthostatic hypotension, another autonomic disorder¹¹. However, to the best of our knowledge, no similar satisfactory usage of pyridostigmine for childhood enteric neuropathies has been reported previously.

In conclusion, we would like to emphasize that pyridostigmine may be a successful treatment agent in patients presenting with unexplained, probably ultrastructurally dysfunctional, gastrointestinal obstruction. Further multicentric clinical and experimental data are required to clarify the role of pyridostigmine in these extremely rare cases.

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