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SURGICAL ASPECT OF CONSTIPATION IN CHILDREN

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Abstract:

Surgical Aspect of Constipation in Children

Constipation is one of the most common complaints of children seen in both pediatrics and pediatric surgery outpatient clinics. Besides the surgical pathologies which may present with constipation, many of the children suffering this problem due to different etiologies are referred to pediatric surgeons at least once in their follow-up. The pediatric surgeons deal with not only the differential diagnosis but also the complications of the constipation itself. Herein, the evaluation of a patient with constipation through a surgical view is presented.

Key Words: constipation, children, surgery

Özet:

Çocuklarda kabızlığın cerrahi yönü

Kabızlık hem Çocuk Hastalıkları hem de Çocuk Cerrahisi polikliniklerinde en sık karşılaşılan şikayetlerdendir. Kabızlıkla kendini gösteren cerrahi patolojilerin yanında, farklı etiyolojiler nedeniyle bu şikayeti olan çocukların çoğu takiplerinde en az bir kez Çocuk Cerrahlarına yönlendirilirler. Çocuk Cerrahları sadece ayırıcı tanıyla değil kabızlığın kendi komplikasyonlarıyla da ilgilenirler. Burada, kabızlık şikayeti olan bir hastanın cerrahi açıdan değerlendirilmesi sunulmuştur.

Anahtar Kelimeler: kabızlık, çocuk, cerrahi

Introduction

Constipation is one of the most common complaints of children, comprising 0,7-29% of cases admitted to outpatient clinics in different series (1). Although it is a frequently met and a challenging problem of both the child, the parents and also the doctors, the definition of this symptom could not easily be made. Not only the infrequent passage of stool is accepted as constipation but also passing hard stools, difficult passage of stools or not evacuating all colonic content should also be included into the definition. The Rome III criteria, published in 2006, provided a widely accepted achievement of clinical diagnosis in children with functional constipation (Table I) (2,3).

Epidemiology

The prevalence of constipation during childhood ranged between 0,7-29%, with the highest values seen in USA (1,4). There is a wide variability between countries, which can be due to feeding characteristics. Jonas et al stated that the constipation prevalence also correlated with low maternal age, female sex, living in a large community and having no other siblings. There is a prominent family history of constipation in many of the cases but no specific mutations have been identified (5,6).

Etiology

Constipation in childhood is multifactorial. In most of the cases no organic cause is detected and this major group is accepted as functional or non-organic constipation. Functional constipation constitutes more than 90% of the cases (7,8). Organic constipation is rarely seen but might be due to different medical and surgical disorders such as anal stenosis, anorectal malformations, spina bifida, sacral agenesis, diabetes, hypothyroidism, cerebral palsy, Hirschsprung disease, intestinal neuronal dysplasia, coeliac disease, cystic fibrosis, cows milk protein allergy and drugs such as opioids (4). The developing child is more susceptible to functional constipation in two different period of time. The first is during toilet training and the second one is when he starts to go to school (4,8). The child should not be forced for toilet training. Most children show readiness for that between 18-36 months of age. Refusing to use the toilets in the school and dietary changes also contribute to developing functional constipation in children (8). Adequate fluid and fiber intake are essential for having normal bowel movements. Previous pain attack during defecation also postpones the following stooling which causes withholding and a vicious cycyle of constipation (4) (Figure 1). The severity of functional constipation increases when the child has psychological problems. On the other hand, constipation itself also causes deterioration of self-esteem of the patient due to complications such as soiling (9).

Evaluation

The most important objective of evaluation is to differentiate organic constipation from the functional ones. The history, often taken from the parents or the caregivers, is very important at this point. Most of the babies pass meconium in the first 24 hours after birth so delay in passage of meconium should be an alert for organic causes of constipation such as Hirschprung's disease or cystic fibrosis (4). The age at onset should be questioned and its relation with toilet training and dietary changes should be investigated. Generally the infants become constipated during passing from breast to formula feeding. The frequency of defecation, the consistency and shape of the stools and presence of blood have to be reported (4,8,9). The pain during defecation and withholding behaviour of the child could be learned during history taking. Soiling, abdominal pain, presence of any urinary symptoms should be evaluated. Dietary characteristics of the child also enlighten the type of the constipation the medical staff face with (3).

Many times, constipation is detected as the underlying cause of abdominal pain, urinary tract infections, urinary incontinence, rectal bleeding in children. Burgers et al. stated that half of the patients with lower urinary tract symptoms in their series had functional defecation disorders according to Rome III criteria (10,11). Children with dysfunctional voiding disorders, repeated urinary tract investigations have to be also evaluated about their bowel habits and they should not be left constipated in order to have better results in the treatment of their urinary symptoms.

The physical examination of the child is also crucial in ruling out some of the organic causes of constipation. Abdominal examination should be concentrated on abdominal distension, fecal masses, a distended bladder. The fecal masses are especially palpated in the left lower quadrant. Physical examination of the presacral area is important to detect pathologies like sacral agenesis, sinus, pigmentation etc. which can be a clue for a neurologic defect underlying constipation. Perianal region should be examined in all patients. Perianal fissures, soiling, the location of the anus could be easily detected (4). Anus is normally located in the middle of the distance between scrotum and coccyx. Anorectal malformations such as anterior ectopic anus is one of the organic causes of the constipation (Figure 2). The perineal movement and presence of rectal mucosal prolapsus are observed during straining. The rectal examination could give clues for rectal impaction, anal stenosis or Hirschprung's disease. The ampulla recti and the sphincter tonus are found dilated and decreased, respectively in children with constipation (9).

The plain abdominal X-ray is generally used to visualize how full the colon is but is also helpfull to detect sacral agenesis and lumbosacral vertebral anomalies (Figure 3 and 4). Contrast enema can show the dilated colonic segments and their fecal content (Figure 5). The transitional zone can be detected in Hirschprung's disease and presence of the contrast in the plain abdominal X-ray taken 24 hours after contrast enema instillation should support the diagnosis.

There are some scoring systems of ultrasonography to detect the size and volume of the rectum. These are more commonly used to detect sphincter defects in recent years. Colonic motility can be investigated by nuclear transit scintigraphy or radio-opaque marker studies (9,12,13). Anorectal manometry is performed to detect the internal anal sphincter relaxation in response to rectal dilation, which is absent in Hirschprung's disease. There are conflicting data about the efficiency of anorectal manometry in children with chronic constipation. Some authors reported that the inflation of the balloon should not create an appropriate tension in the severely dilated rectum to provide an anal sphinter relaxation. The decreased ability of the internal sphincter to relax during rectal distension is defined as a manometrical finding of constipation by the others (4,9,14). The rectal biopsy is accepted as the cornerstone of the diagnosis of Hirschprung's disease. The full-thickness biopsy is performed under general anesthesia. The relation of the anal location and the sphincter complex can be evaluated at the same time with a nerve stimulator. The rectal suction biopsy could be performed without anesthesia (4,9).

Treatment

The treatment of functional constipation generally continues for a long period of time so the initial step should be establishing a good relationship with the parents and the child. They should be informed about the reason of the constipation, its consequences such as rectal bleeding, soiling and the treatment options (4,7).

Fecal disimpaction The fecal contents in the severely dilated rectum and rectosigmoid should be evacuated. This procedure can be performed in outpatient basis or after being hospitalized according to the status of the patient. Enemas are performed 3 or 4 times a day and if needed, they are supported with oral balanced-electrolyte solutions. Manual disimpaction is carried on under general anesthesia in a group of patients such as children with mental retardation or children with fecalomas. The complete disimpaction should be confirmed with abdominal radiography (4,15).

Laxatives should be included into the treatment regimen and the dose should be personalized for each patient. The effective dose is achieved when the colon is kept empty with the bowel movements (9,15).

Life style modifications, dietary regulations and toilet training are important factors for relieving constipation. Hydration and exercise are also basic recommendations. The American Health Foundation recommends that children over 2 years of age should take "age in years plus 5-10 g fibre" each day . Vegetables, fruits, breads/cereals are fiber-rich foods. Whole grains also have supporting effect to improve bowel movements (3,16). The parents have to organize a schedule for feeding times and the child should better get used to go to toilet after breakfast and dinner. The aim of toilet training is to empty the bowel each day at regular periods.

Biofeedback is applied in selected patients. Yik YI used home transcutaneous electrical stimulation and reported a 50% success in treatment-resistant patients (17).

Many of the children will respond the medical treatment with dietary regulations. But there is a group of patients whose symptoms continue. Higher and higher doses of laxatives have to be used for longer periods of time, maybe during whole lifetime. The parents are reluctant to continue with the medications. The surgical alternatives are indicated in these children. Fecal diversion and transabdominal resection of the dilated rectum and rectosigmoid were performed. Soylet et al stated that Malone antegrade continence enema technique was effective in children with fecal incontinence when performed after confirming that the patients was completely clean using Peña's programme (18). Internal sphincter myectomy, botulinum toxin injections are also used. Levitt et al. presented that there was a significant reduction or elimination of laxative requirement of their patients in whom a transanal full-thickness rectosigmoid resection and primary colo-anal anastomosis were performed (15).

Conclusion

Although it is generally underestimated, constipation is a significant cause of morbidity in children. After excluding the organic pathologies which comprise nearly 5% of all the etiologic factors, the functional constipation should be treated before letting its vicious cycle starts. The aggressive medical treatment with enemas and laxatives should be combined with dietary modifications. The indication for surgery is not limited only with the refractory symptoms but higher doses of medications and longer periods of treatment also may require a surgical intervention.

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Table I: Rome III criteria

Ages 1-3 years	**Two of the following, present for at least 1 month**
	1) Two or fewer defecations per week, 2) At least one episode/week of incontinence after the acquisition of toileting skills, 3)History of excessive stool retention, 4) History of painful or hard bowel movements, 5)Presence of a large fecal mass in the rectum, 6) History of large-diameter stools that may obstruct the toilet
Ages 4 years and older	**A minimum of two of the following symptoms, occurring at least once per week for 2 months**
	1) Two or fewer defecations in the toilet per week, 2) At least one episode of fecal incontinence per week, 3) History of retentive posturing or excessive volitional stool retention, 4) History of painful or hard bowel movements, 5) Presence of a large fecal mass in the rectum, 6) History of large-diameter stools that may obstruct the toilet

Figure 1: Vicious cycle of constipation in children

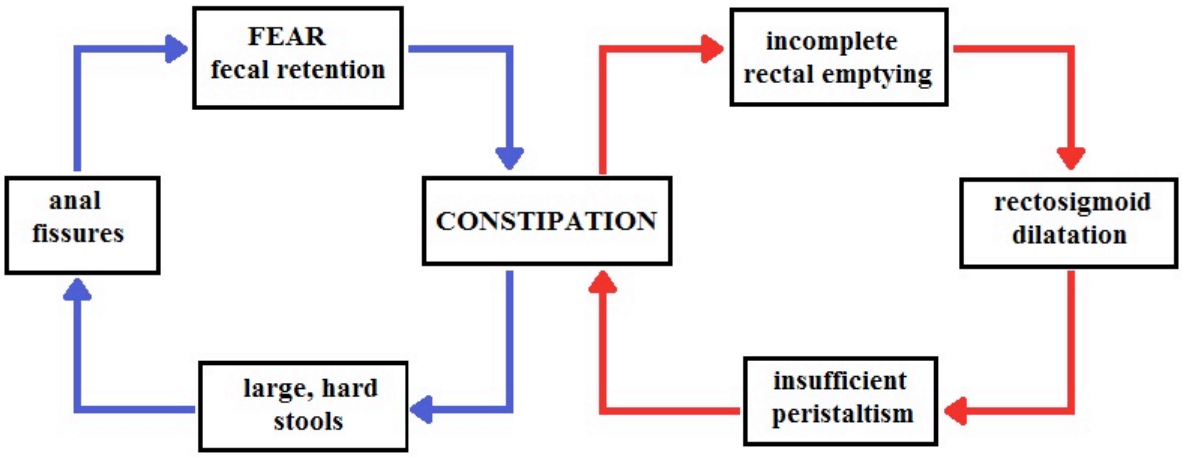
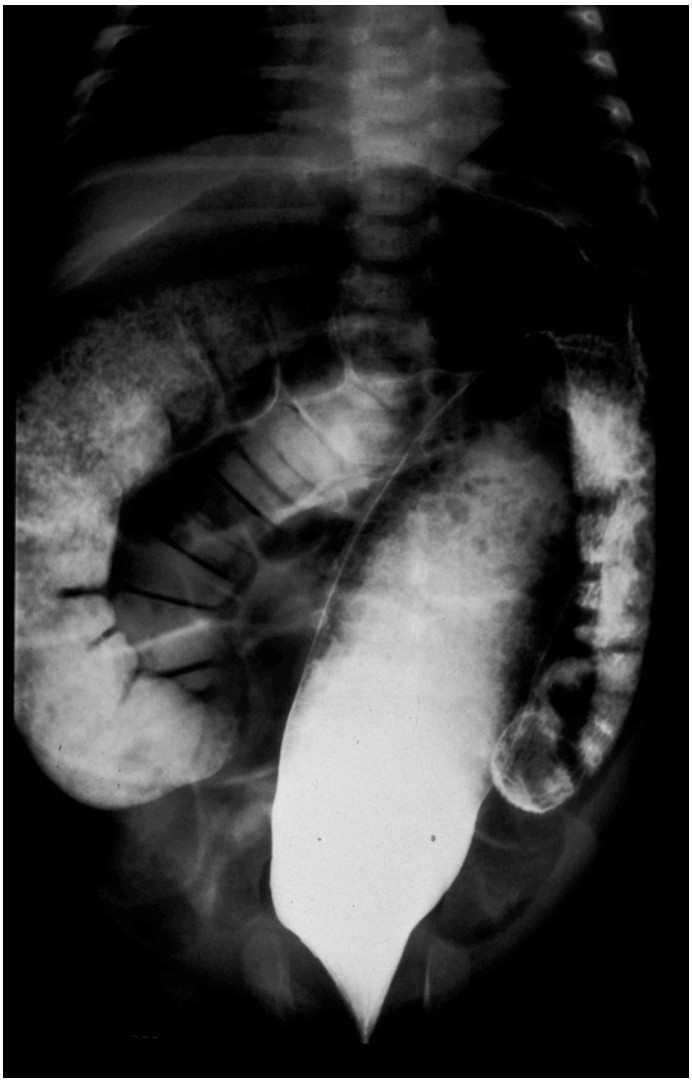


Figure 2: Anorectal malformations especially the lower types as seen in the figure usually associate with constipation.

Figure 3 & 4: Plain abdominal X-rays showing colon full of feces and gas

Figure 5: Contrast enema showing dilated colon and its excessive fecal content



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