CASE REPORT

Chronic intestinal pseudo-obstruction in children - report of seven cases

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Abstract

Objective: to describe the clinical characteristics and histological alterations in seven children suspected of presenting chronic pseudo-intestinal obstruction syndrome.

Methods: a retrospective study of all patients who attended the gastroenterology outpatient clinic at Hospital das Clínicas, Universidade Federal de Minas Gerais, in the past 10 years.

Results: based on the review of the hospital's records, seven patients were selected. Their charts were reviewed and the relevant clinical data recorded. Diagnoses were based on clinical, laboratory, and histological findings.

Conclusion: although this is a rare syndrome, differential diagnosis should be performed whenever the patient presents signs and symptoms of digestive tract obstruction with no associated mechanical cause. Early diagnosis and specific treatments (both clinical and surgical) should be encouraged in order to improve the quality of life and to extend survival in affected patients.

In adults, CPI is often secondary to systemic diseases such as progressive systemic sclerosis, amyloidosis, and Chagas’ disease. However, in children, CPI is frequently a primary disorder, affecting enteric smooth muscle tissue (visceral myopathy) and the enteric intrinsic nervous system (visceral neuropathy). Both isolated and familial cases have been reported. The classification of CPI is based on the histopathologic alterations observed through techniques developed by Smith, such as silver staining, among others.

The term “idiopathic”CPI is applied to the group in which a secondary disease was not determined, or when the affected tissue is unavailable for analysis, or, still, if the tissue appears normal on histopathologic study employing conventional staining techniques.

Chronic intestinal pseudo-obstruction (CIP) is a rare and heterogeneous disease, which was described for the first time in 1958 by Dudley. It is characterized by intermittent signs and symptoms of intestinal obstruction without a mechanical cause, caused by neuromuscular alterations in the digestive tube, reversible or not. A single or multiple segments may be affected. Clinical presentation is variable, and depends on the location affected. Concomitant extra-digestive alterations may be present.

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Histology is the method of choice to ensure a definitive diagnosis; this method yields information concerning disease extension, through serial biopsies of the entire digestive tract, which are obtained, whenever possible, through laparotomy. For ethical reasons, it is not always possible to obtain such biopsies. If that is the case, diagnosis is based on contrast studies, which rule out mechanical causes, and on antroduodenal manometry, which evidences a clear pattern of myopathic or neuropathic alteration. Some histologic techniques (HE stain and Mason’s trichomy, immunohistochemistry, silver stain, acetylcholinesterase stain, electronic microscopy) are useful for the differential diagnosis of visceral myopathy and neuropathy.

The objective of the present study is to describe the clinical signs and histological alterations in the intestinal biopsy of seven children with CIP, treated at the pediatric gastroenterology service at Hospital das Clínicas, Universidade Federal de Minas Gerais, over a 10-year period.

Patients and methods

The identification of children with CIP was performed by reviewing the inpatient records at Hospital das Clínicas from 1988 to 1998. We selected 80 children with an initial diagnosis of intestinal obstruction, Hirschsprung’s disease, and constipation not responding to the treatment. A final presumed CIP diagnosis was observed in only seven children. The chart for each of these children was reviewed, and data were collected using a standardized form. The survey focused on the main characteristics of CIP syndrome (Table 1).

Diagnosis of CIP syndrome is difficult; it is based on clinical findings of intestinal obstruction in the absence of a defined mechanical cause, associated with presence of radiological and histological alterations.

In our series, four patients were female; median age at diagnosis was 9 months (p25=5months and p75=84months). Alterations in nutritional status were observed in 85.7% of the cases (the method used to assess nutritional status was not recorded in the charts). The most frequent signs and symptoms were abdominal distension, constipation, vomiting and inadequate weight gain, diarrhea, and intercalated urination. In five children, abdominal X-ray showed dilatation of intestinal loops, hydroaerial level, and gastric distension. Also in five children, ultrasound showed megabladder, pyelocaliceal dilatation, and excretory system duplication. Four manometries (3 anorectal and 1 esophageal), did not evidence alterations that could be associated with the syndrome. The most important findings of laparotomy in four patients were microcolon and malrotation, megabladder, dilatation of the small intestine, extremely thin rectal musculature, mobile cecum, and diffuse dilatation of intestine loops.

Histological evidence of visceral myopathy included vacuolar degeneration of smooth muscle fibers, fibrosis, atrophy, hypertrophy in the external and internal muscle layer, and collagen deposition in the external muscle layer, observed in two patients (cases 1 and 2). Such evidence suggests type 1 or 2 histological phenotypes, which show intrinsic defects on the myocyte and/or alterations in the extra-cellular matrix. However, it is not possible to be sure about this association, since the histological techniques used were not identical.

In one patient (case 3) we observed vacuolar degeneration in only one bladder muscle bundle, without alterations in the enteric musculature, and we questioned the possibility of an artifact. Another patient (case 4) presented hypertrophy of the muscular layer on conventional HE stain. Evaluation of the muscular layer, in case 5, was compromised by the quality of the biopsy sample (superficial). In others (cases 6 and 7), there was no evidence of abnormalities in the enteric smooth musculature. Only one patient (case 6) presented visceral neuropathy features: hypertrophy of nervous fibers and stressed neuronal depopulation in the intramural nervous plexuses of the intestine and bladder, corresponding to the classification of neuropathy with hypoganglionism.

In the other patients, we observed the presence of neurons of normal number and size.

Two children required parenteral nutrition until the moment of death. Other children ate a normal diet for their age, without any special requirements, although with irregular height/weight. Only one child received cisapride, with partial improvement of the symptoms. The surgical interventions performed were sigmoidectomy and colostomy (case 2) due to abdominal distension; duodenoplasty, correction of malrotation, and vesicostomy (case 3); ileostomy and colostomy (case 7) due to diffuse dilatation of intestinal loops. Despite the treatment, three patients died. Other three are still being followed; these present intermittent symptoms such as diarrhea and constipation and irregular height/weight gain. There are no records concerning the evolution of patient 6.

Discussion

Chronic intestinal pseudo-obstruction is a rare though frequent disease during the 1st year of life, mainly in the neonatal period. The clinical signs presented by the children with CIP status seen at our hospital were similar to those reported in the literature. The extra-digestive alterations found in these patients were also described by other authors. 6,12-15 Ghavamian and Granata observed that such manifestations were associated with visceral myopathy. However, in the present study, only one patient (case 1) presented this association. In two other patients (cases 3 and 5), we were not able to histologically determine the presence of either visceral myopathy or neuropathy.
### Table 1 - Summary of clinical cases

<table>
<thead>
<tr>
<th>Case 1 (CSC)</th>
<th>Case 2 (MML)</th>
<th>Case 3 (JSL)</th>
<th>Case 4 (JPFG)</th>
<th>Case 5 (CML)</th>
<th>Case 6 (ASS)</th>
<th>Case 7 (PVR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex/age</td>
<td>M/6 months</td>
<td>F/8 years</td>
<td>F/6 days</td>
<td>M/9 months</td>
<td>F/3 years</td>
<td>F/7 years</td>
</tr>
</tbody>
</table>

#### Signs and symptoms

- **Case 1**: Intestinal invagination* and intercalated micturition
- **Case 2**: Intestinal obstruction, abdominal distension, constipation
- **Case 3**: Abdominal distension, vomiting, weight loss
- **Case 4**: Abdominal distension, vomiting, constipation
- **Case 5**: Abdominal distension, weight loss, diarrhea

#### Familial history**

- **Case 1**: –
- **Case 2**: +
- **Case 3**: –
- **Case 4**: –
- **Case 5**: +
- **Case 6**: –
- **Case 7**: –

#### Nutritional status***

- **Case 1**: Eutrophic
- **Case 2**: Malnourished
- **Case 3**: Malnourished
- **Case 4**: Malnourished
- **Case 5**: Malnourished
- **Case 6**: Malnourished
- **Case 7**: Malnourished

#### Other pathologies

- **Case 1**: IVC, mitral failure
- **Case 2**: Urinary infection
- **Case 3**: Urinary infection, delayed neuropsychomotor development
- **Case 4**: –
- **Case 5**: –
- **Case 6**: –
- **Case 7**: –

#### Abdominal X-ray

- **Case 1**: Diffuse dilatation of intestinal loops
- **Case 2**: Intestinal dilatation and hydroaerial level
- **Case 3**: Gastric and small intestine distension
- **Case 4**: NP
- **Case 5**: NP
- **Case 6**: Gastric distension
- **Case 7**: Extensive intestinal pneumatosis

#### Bowel movement

- **Case 1**: NP
- **Case 2**: NP
- **Case 3**: NP
- **Case 4**: Dilatation of the small intestine, slow intestinal transit
- **Case 5**: NP
- **Case 6**: NP
- **Case 7**: NP

#### Opaque enema

- **Case 1**: NP
- **Case 2**: Colon dilatation without stenosis
- **Case 3**: Intestinal malrotation and microcolon
- **Case 4**: Sigmoid dilatation
- **Case 5**: Delay in the elimination of contrast
- **Case 6**: Colon dilatation
- **Case 7**: Colon dilatation, intestinal pneumatocoele

#### Abdominal ultrasound

- **Case 1**: Megabladder
- **Case 2**: NP
- **Case 3**: Megabladder and dilation pyelocaliceal
- **Case 4**: NP
- **Case 5**: Normal (urography=megabladder)
- **Case 6**: Normal
- **Case 7**: Duplication of the excretory system

#### Manometry

- **Case 1**: Anorectal (normal)
- **Case 2**: NP
- **Case 3**: NP
- **Case 4**: Anorectal sensitivity↓
- **Case 5**: Esophageal (normal)
- **Case 6**: Anorectal (normal)

#### Histology

- **Case 1**: Myopathy
- **Case 2**: Myopathy
- **Case 3**: Inconclusive
- **Case 4**: Inconclusive
- **Case 5**: Inconclusive
- **Case 6**: Neuropathy
- **Case 7**: Inconclusive

#### Clinical treatment

- **Case 1**: Normal diet
- **Case 2**: Normal diet, intestinal enema
- **Case 3**: TPN, antibiotics
- **Case 4**: Normal diet, mineral oil
- **Case 5**: Normal diet, intestinal enema, cisapride
- **Case 6**: TPN, antibiotics
- **Case 7**: –

#### Surgical treatment

- **Case 1**: Exploratory laparotomy
- **Case 2**: Sigmoidectomy, total colectomy
- **Case 3**: Duodenoplasty and correction of malrotation, ileostomy, vesicostomy
- **Case 4**: NP
- **Case 5**: NP
- **Case 6**: NP
- **Case 7**: Colostomy, ileostomy

#### Evolution

- **Case 1**: Diarrhea, constipation ↓weight (pneumonia)
- **Case 2**: Death after 4 years
- **Case 3**: Death after 3 months (cerebral infarction)
- **Case 4**: Constipation
- **Case 5**: Abdominal distension and constipation ↓weight
- **Case 6**: Contact loss
- **Case 7**: Death after 10 months (anaphylactic shock)

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**F** (female) | **M** (male) | **NP** (not performed) | **TPN** (total parenteral nutrition) | **+** (present)/- (absent) | **NPMD** (neuropsychomotor development) | **IVC** (interventricular communication) | **↓** (decrease) | ***:** Sole episode of intestinal invagination | ****:** Relatives with defined diagnosis or not | *****:** Nutritional status at the patient’s admission
Before a final and definitive diagnosis, individuals with CIP syndrome may be erroneously diagnosed with intestinal invagination, neonatal obstruction, refractory constipation, etc.10,17 The same happened in two of the present patients (cases 1 and 2), who were admitted to the hospital with an initial diagnosis of intestinal invagination and neonatal intestinal obstruction, respectively, with posterior confirmation of visceral myopathy in both.

Radiological alterations were similar to those described by Rudolph and Granata.6,12,14 Some findings in contrast X-ray are interpreted as CIP patterns: dilatation without stenosis, abnormal peristaltic activity, delay in gastric emptying and decrease in colon haustrations.12 Intestinal transit and opaque enema revealed the following alterations: delay in contrast medium elimination, diffuse dilatation without stenosis, as well as segmental intestinal dilatation, malrotation, and microcolon. These examinations are required to rule out mechanical obstruction, and they serve as orientation concerning the need for early specific interventions, in order to improve prognosis.

Abdominal ultrasound is not frequently used to diagnose CIP. However, it may be useful to investigate extra-digestive alterations associated with the syndrome, such as those of the genitourinary tract, even in utero.14,16

The histological classification of these patients was compromised, since only routine staining (HE and Tricomic) was used for the diagnosis. Therefore, the patients classified as idiopathic could present structural and/or functional alterations not detected in this review. Several histological techniques (immunohistochemistry, silver stain, acetylcholinesterase stain, electronic microscopy, etc.) are currently used with the objective of differentiating structural and functional alterations of enteric nerves and muscles.6,14,18,19

Most of the times, the treatment of CIP is palliative, and aims at controlling the symptoms, promoting adequate nutritional support, and trying to restore intestinal motility with the use of prokinetic drugs. A study carried out by Lorenzo et al.20 in 1995, showed that from 18 patients, 12 obtained success with jejunal nutrition, indicating that this technique is a therapeutic option to diminish morbidity and mortality resulting from prolonged total parenteral nutrition.

The literature describes the use of prokinetics for the control and restoration of digestive tract mobility, with uncertain outcomes.6,18,21,22 One of the drugs that has received a great amount of attention is cisapride, which so far has given good results.18 Other prokinetics, such as metoclopramide, erythromycin, and bethanechol, have been used with unsatisfactory results.18,21,22

The use of corticoids has been reported in patients with idiopathic myositis of the small intestine in whom histology shows a considerable inflammatory reaction in the intestinal muscular layer. In this group, the early use of corticoids before the appearance of fibrosis has produced satisfactory results.23,24

The indication of different surgical techniques must be analyzed for each case individually. Several authors suggest numerous treatments, such as gastrotomy, duodenojejunostomy, total enterectomy, bowel transplantation, etc., with the objective of feeding the patient or of decompressing the small intestine.7,18 Sometimes, as in the case of localized disease, surgical treatment, with the resection of the affected segment, may be curative.7 In this series, the patients who were submitted to surgery for intestinal decompression (cases 2, 3, and 7) presented partial improvement, although with briddles and suture dehiscence.

Despite being a rare syndrome, CIP syndrome should always be considered in cases of an intermittent intestinal obstruction in the absence of a mechanical cause. Early diagnosis is important, with a careful investigation to determine the best moment to start the treatment, and, if possible, with specific treatments that will contribute to improve the patient’s quality of life and to increase survival in affected patients.

References


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