A Rare Case of Adult-Onset Rectosigmoid Hypoganglionosis

Mohammed Yousef Aldossary
Antonio Privitera
Obai Elzamzami
Nemat Alturki
Khalid Sabr

Patient: Male, 20
Final Diagnosis: Rectosigmoid hypoganglionosis
Symptoms: Severe abdominal pain • obstipation • vomiting • shortness of breath • palpitations
Medication: —
Clinical Procedure: Hartmann’s procedure
Specialty: Surgery

Objective: Congenital defects/diseases
Background: Intestinal hypoganglionosis is very rare and accounts for 3% to 5% of all classified congenital intestinal innervation disorders. Isolated hypoganglionosis of the colon is a particularly rare form of the disease, and differential diagnosis includes association with Hirschsprung’s disease and chronic intestinal pseudo-obstruction (CIPO) related to visceral myopathies. Most cases are diagnosed at an early age or in childhood with only a few cases reported in adults.

Case Report: We report a case of isolated hypoganglionosis of the rectum and sigmoid presenting as an emergency with acute intestinal obstruction in a 20-year-old male patient. A history of chronic constipation was reported since childhood, but this condition had never been investigated. A preoperative CT scan showed a megasigmoid and megarectum. A Hartmann’s procedure was performed. The patient made a slow recovery and was discharged on the 12th postoperative day in good condition. Histology showed features consistent with isolated hypoganglionosis, and a full thickness rectal biopsies taken 2 months later confirmed the diagnosis.

Conclusions: Isolated hypoganglionosis in an adult is very rare, and a high index of suspicion is warranted in young patients with a history of chronic constipation to avoid delayed presentation as an emergency.

MeSH Keywords: Adult • Delayed Diagnosis • Hirschsprung Disease

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Background

Intestinal innervation disorders represent a cluster of malformations of the intestinal nervous system and include intestinal neuronal dysplasia, Hirschsprung’s disease, hypoganglionosis, and ganglioneuromatosis [1–3]. Although these subtypes have distinct histopathological features, clinical manifestations are similar with chronic constipation or pseudo-obstruction being the most common presenting symptoms [1,2]. Differential diagnosis includes chronic intestinal pseudo-obstruction (CIPO) that can be associated with visceral myopathies and mutations of the ACTG2 gene involved in myenteric contractility [4]. Hypoganglionosis is divided into 2 types: the isolated and Hirschsprung-associated form [5]. Isolated hypoganglionosis is rare, representing 3% to 5% of all congenital intestinal neurological diseases [6]. The histopathological features include hypertrophy of the muscularis mucosae, decrease in the activity of acetylcholinesterase in the lamina propria, and significant reduction in the number of myenteric ganglia. Diagnosis and ability to differentiate between different patterns of innervation is based on histopathology and immuno-histochemical markers [5,6]. The disease most commonly present in infancy or childhood with only a few cases reported in adults mainly diagnosed after elective surgery for intractable constipation or pseudo-obstruction [7,8]. The authors report a case of isolated hypoganglionosis in an adult presenting as an emergency; we also provide a review the literature.

Case Report

A 20-year-old male Saudi patient presented to the Emergency Department complaining of severe abdominal pain, obstipation, vomiting, shortness of breath, and palpitations. Past history revealed intermittent constipation since early childhood that had never been investigated and self-treatment with on and off use of laxatives. No symptoms of urinary dysfunction or infections were reported. He had no co-morbidities and was not on any medication. Family history was unremarkable. On examination, the patient was tachycardic (heart rate, 140 beats per minute), hypertensive (blood pressure, 146/92 mmHg), and tachypneic (respiratory rate, 23 breaths per minute). The abdomen was grossly distended with rebound tenderness and bowel sounds were scant. Fluid resuscitation and oxygen administration were initiated. A nasogastric tube and urinary catheter were inserted. Blood tests revealed a leukocyte count of 12 900 cells/μL and blood gas levels showed mild respiratory alkalosis. Acute x-ray series showed large-bowel dilatation with multiple air-fluid levels (Figure 1). A computed tomography (CT) scan of the abdomen and pelvis revealed gross dilatation of the sigmoid and rectum with a diameter up to 20 cm with a functional obstruction at the level of the lower rectum. No wall thickening, peri-colonic stranding, pneumatosis, or pneumoperitoneum were noted. There was significant stool volume throughout. The small bowel and urinary bladder were displaced by the distended colon to the right, with the liver and gallbladder being displaced posteriorly (Figure 2). An emergency laparotomy was performed, and this revealed a redundant megasigmoid and rectum (Figure 3). A rigid sigmoidoscopy was carried out and showed only fecal impaction with no evidence of obstructing lesions. A Hartmann’s procedure was performed. The patient made a slow but uneventful recovery and was discharged on the 12th postoperative day. Histopathological examination of the resected specimen showed features consistent with hypoganglionosis. The ganglion cells were reduced but normal with no signs of degeneration or gliosis (Figure 4A–4C). The
muscularis mucosa was unremarkable with absence of atrophy, vacuolar degeneration, fibrosis, and normal collagenous network raising no suspicion of myopathy (Figure 4D). The proximal resection margin showed normal ganglia distribution. At 2 months from the surgery, full thickness rectal biopsies were taken under general anesthesia just above the dentate line for further characterization of the innervation disorder. Histology of the rectal specimen confirmed the diagnosis of hypoganglionosis with no evidence of agangliosis. The patient was reluctant to undergo definitive surgery and at 1-year follow-up had no complaints with a perfectly functioning colostomy.

**Discussion**

The most common intestinal innervation disorder is Hirschspung’s disease with a reported prevalence of 1: 5000.
and a female to male ratio of 1:4 [9]. The disease is charac-
terized by the congenital absence of ganglion cells in the sub-
mucosal and myenteric neural plexuses of the rectal wall with
variable extension proximally. Etiology is represented by im-
paired caudocranial migration of neuroblasts during the first 3
months of gestation [10,11]. The transition of the distal agan-
glionic segment to the proximal normal bowel may be char-
acterized by a segment of hypoganglionosis with maintained
but reduced number of ganglia [11,12]. A number of ganglia
less than 10 mm is generally considered diagnostic for hypo-
ganglionosis [13]. Isolated hypoganglionosis is not related to
Hirschsprung’s disease is a distinct and rare disorder. In this
variety, the submucosal nerve plexus is normal while a signif-
icant reduction in the myenteric ganglia is noted. Other fea-
tures include hypertrophy of the muscularis mucosae and de-
creased acetylcholinesterase activity in the lamina propria [5,6].
In congenital hypoganglionosis, the number and size of gangli-
on cells is reduced at birth, and although their size increases
with time, their number does not change. On the other hand,
acquired hypoganglionosis is of late onset and characterized by
degeneration of ganglion cells and histological findings of gli-
osis [13]. Histological examination of full-thickness rectal biop-
sies is the gold standard for diagnosis. Hematoxylin and eosin
stain is most commonly used and allows for diagnosis in most
cases. However, morphologic immaturity and small size of gan-
glion cells with irregular distribution in the submucosa may lim-
it identification with high expertise needed. Also, acetylcholin-
esterase staining is technically demanding and not universally
available [14]. More recently peripherin, S-100, and Calretinin
immunohistochemistry have been shown to be a valuable tool
to aid diagnosis [14–16]. Hypoganglionosis should be distin-
guished by cases of CIPO related to visceral myopathy that can
be associated with mutations of the ACTG2 gene mutations in-
volved in muscle contractility. In these cases, a family history is
often positive, functional dysfunction of other organs is com-
mon as well as pathological features of the muscularis propria
including vacuolization and fibrosis [4]. A recent review of the
literature identified 92 patients with a diagnosis of isolated
hypoganglionosis (69 males and 23 females with a mean age
of 4.85 years) [6]. Symptoms at presentation included chronic
constipation or pseudo-obstruction. Only 70% of these pa-
tients had surgical intervention at the time of presentation and
of these 80% had definitive surgery with pull-through proce-
dures and 16% stoma formation. The overall mortality was 8%.
A recent nationwide study in Japan reported 109 cases of iso-
lated hypoganglionosis and provided detailed information on
90 patients (34 males and 56 females) with 19 being exclud-
ed from the study for diagnostic doubt or incomplete descrip-
tions [17]. The diagnosis was made in the neonatal period in
all patients. Almost all patients were initially treated with for-
mation of stoma. Creation of a jejunostomy was significant-
ly associated with a lower mortality. The overall mortality rate
was 22%. A study from South Korea reported 24 cases of adult
presentation of hypoganglionosis in patients who had under-
gone surgery for intractable constipation or chronic pseudo-
obstruction. The mean age was 40 years [8]. There are only 5
other cases in the literature with adult presentation of hypo-
ganglionosis as an emergency [7,18–21]. Paucity and intermit-
tence of symptoms had allowed for a late diagnosis and ulti-
mate acute presentation. Three of these case presented with
toxic megacolon, 1 with phytobezoar obstruction and 1 with
sigmoid volvulus. In our case, the initial sigmoid resection had
shown hypoganglionosis with normal proximal resection mar-
gin. Subsequent rectal biopsies excluded aganglisis and con-
formed hypoganglionosis. A functional obstruction seen on pre-
operative CT scan is a common finding in these patients and
usually associated with a greater reduction of ganglion cells
at the level of the transition zone [8].

Conclusions

Isolated hypoganglionosis is very rare and a high index of sus-
picion is required in young patients with prior history of chron-
ic constipation to avoid delayed diagnosis and emergency pre-
sentation. Histopathology and immunohistochemistry allow
differentiation among the various patterns of innervation dis-
orders. Acute presentation with need of emergency surgery is
rare and treatment should be limited to colonic resection with
subsequent definitive treatment of the rectal disease.

Conflicts of interest

None.

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