Current views

Neuronal intestinal dysplasia: an entity of chronic intestinal pseudo-obstruction

V.A. Komborozos, G.J. Skrekas

SUMMARY

Abnormalities of bowel innervation and ganglion distribution are represented by a wide spectrum of conditions, including an entity known as neuronal intestinal dysplasia [NID].

NID is characterized by localized or disseminated hypertrophic and immature ganglion cells, hyperplasia of the myenteric and submucosal plexi with giant ganglia [NID type B], hypoplasia or aplasia of sympathetic innervation of the myenteric plexus [NID type A] and sometimes by the presence of ectopic neural formations in the submucosa and muscular stratum. The frequency of NID coexisting with Hirschsprung's disease has been reported to vary from 20-66%.

Special diagnostic clinical signs do not exist, while a precise correlation between histology and clinical manifestations is lacking.

The precise options for therapy have not been clearly established. If aganglionosis is excluded, treatment is initially conservative, since clinical and histological improvement has been reported in cases with mild dysganglionosis, in the presence of immature ganglion cells in the myenteric plexus, in atopies of ganglions of the submucosal plexus, as well as in cases of limited areas NID type B. When symptoms can not be controled with medical treatment, a temporary loop colostomy could be undertaken. In cases with severe obstructive symptoms subtotal colectomy and ileorectal anastomosis is suggested.

Key words: Constipation, pseudobstruction, neuronal intestinal dysplasia

2nd Department of Surgery, "Evangelismos" General Hospital, Athens, Greece

Author for correspondence:

Vassilios Komborozos, 15, Vosporou str., 151 24 Amarousion, Tel.: (301) 6196484, Fax: (301) 6105683

Intestinal pseudo-obstruction is defined as a syndrome in which symptoms and signs of intestinal obstruction occur, without evidence for a mechanical obstruction.[1]

Previous studies have highlighted the eterogenous nature of the syndrome, which is characterized by a great variety of pathological abnormalities of the smooth muscle and/or myenteric plexus and presenting features.[2,3] The acute syndrome, (Ogilvie's syndrome), is associated with postoperative, post-traumatic and medical conditions and is potentially reversible.[4] Chronic intestinal pseudo-obstruction (CIPO), is associated with a grate variety of disease entities and drugs,[2,5] but no underlying cause can be identified in a great proportion of patients, in whom the disease is characterized as primary. CIPO is characterized by gastrointestinal dysfunction, as well as neurological and urological abnormalities, which offer valuable contribution in diagnosis.

Two main subtypes of primary CIPO are recognized with the use of various histological stains, such as H&E stain, Smith's silver stain, electron microscopy and mannometric findings:[6]

1. The neuropathetic subtype, characterized by familiar, sporadic and developmental dissorders of myenteric plexus, and
2. The myopathetic subtype, characterized by sporadic and familiar visceral myopathies.

Abnormalities of bowel innervation and ganglion dis-

tribution are represented by a wide spectrum of conditions, including an entity known as neuronal intestinal dysplasia (NID).[7-16]

The entity was first described by Scharli and Meier-Ruge in 1971.[17] It was characterized by hypertrophic and immature ganglion cells, hyperplasia of the myenteric and submucosal plexi with giant ganglia (NID type B), hypoplasia or aplasia of sympathetic innervation of the myenteric plexus (NID type A) and sometimes by the presence of ectopic neural formations in the submucosa and muscular stratum.[10-12,14] These histologic abnormalities may occur localized or disseminated and may or may not be associated with distal aganglionosis (Hirschsprung's Disease).[7,8,10,11,13,17-21] The frequency of NID coexisting with Hirschsprung's disease has been reported to vary from 20-66%.[12-15]

The premature differentiation of neural cells of myenteric and submucosal plexuses during embryogenesis, which in turn blocks neuroblast colonization of the colon and rectum, is considered to be a cause of the above congenital abnormality.[22] Inactivation of Ncx-Hox 1 IL.[1] gene, which is mainly expressed in neural crest derived tissues, seems to be a novel pathogenesis in the development of congenital megacolon and NID, in homozygus mutant mice.[23]

Diagnosis and classification of CIPO presents remarkable difficulties, because special diagnostic clinical signs do not exist, while a precise correlation between histology and clinical manifestations is lacking. Conventional contrast radiology continues to be the first-line investigation to exclude mechanical obstruction. Radioscopy and gastrointestinal manometry may help in distinguishing neuropathetic and myopathetic forms.[6,24,25] At the moment histologic evaluation of full thickness intestinal biopsies is the method of choise in NID diagnosis. The histologic diagnosis of NID requires a high index of suspicion as well as the availlability of special techniques, (H&E stain, catecholamine staining by glyoxylic acid fluorescence, as described by Lindvall and Bjorklund, Smith's silver stain and electron microscopy), and expertise.[14,26,27]

The precise options for therapy have not been clearly established, because of the lack of well-defined clinical, radiologic and manometric findings.[9,28] A significant step in NID therapy is the exclusion of coexistent Hirschsprung's disease. If aganglionosis is excluded, treatment is initially conservative, since clinical and histological improvement has been reported.[29] NID coexistent with atopic ganglions of myenteric plexus into the muscular stratum of the bowel wall is usually corelated with severe motility abnormalities, which have no response to concervative treatment.[30,31] On the contrary, in other NID cases, such as in mild dysganglionosis, in the presence of immature ganglion cells in the myenteric plexus, in atopies of ganglions of the submucosal plexus, as well as in cases of limited areas NID type B, concervative treatment is usually efficient.[31]

When symptoms can not be controled with medical treatment, a temporary loop colostomy could be undertaken, given that it is impossible to be specified the extent of the affected bowel. In cases with severe obstructive symptoms subtotal colectomy and ileorectal anastomosis is suggested.[28,31] In our experience on two cases of NID type B, as well as in an analogous case reported by Gites et al,[32] subtotal colectomy and ileorectal anastomosis had immediate results.

It is to be hoped that with the standarization of more sophisticated histological methods, the surgeon will be able to resect areas with aganglionosis as well as with NID, limiting the likelihood of recurrent symptoms, the number of reoperations and improving the quility of life of those patients.

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