

The Duhamel-Martin operation in adult Hirschsprung's disease performed with mechanical sutures

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The Duhamel-Martin operation is widely used for the treatment of adult Hirschsprung's disease. Purpose of this article is to represent our technique in performing this procedure using mechanical sutures entirely. We performed the operation, as a single or staged procedure in three patients. There were not major postoperative complications and the long-term results were excellent.

Congenital megacolon is the commonest congenital cause of non-mechanical bowel obstruction in children¹. On the contrary, Hirschsprung's disease in the adolescent is a rare and often misdiagnosed cause of lifelong refractory constipation. Among the operations commonly performed for the treatment of this pathologic entity in adults, Duhamel-Martin operation remains a widely accepted procedure².

In this article we describe three cases of adult's Hirschsprung's disease that underwent the Duhamel-Martin operation completely with mechanical sutures.

Case reports

Case 1

A 19-year-old man suffered from constipation and recurrent fecal impaction since infancy. Due to worsening of symptoms during last year, he was accosted to a gastroenterology department. Investigation with barium enema revealed extreme dilatation of large bowel suggestive of congenital megacolon (fig. 1) and the patient was referred to our department for definite treatment.

We believe that the use of mechanical sutures in the Duhamel-Martin operation makes the surgical procedure easier and the total operating time as well as mean hospital stay is minimized. The technique can be recommended in every case of adult Hirschsprung's disease.

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The patient underwent an operation for bowel decompression and confirmation of the diagnosis. During the operation full thickness bowel biopsies were taken from various bowel segments and a transverse loop colostomy was created for bowel decompression. Biopsies revealed complete absence of ganglionic cells in the myenteric and submucosal nerve plexus in the lower rectum, findings that confirmed the diagnosis of congenital megacolon. The biopsies from the rest of the large bowel were normal. Three months later he underwent the Duhamel-Martin operation. He had an uneventful recovery and remained in hospital for 8 days. Two months later he readmitted for colostomy closure. Seven years later the patient is fully continent of both flatus and feces and has at least one stool every alternate day. His sexual function remains normal.

Case 2

A 15-year-old boy living in a rural area had a lifelong history of constipation that required suppositories for bowel movements. He mentioned that he had defecation every fourth or fifth day. After a severe episode of fecal impaction presented with abdominal pain and



Figure 1. Barium enema showing extreme dilatation of large bowel.

vomiting, he underwent a barium enema that was suggestive of Hirschsprung's disease. Rectal biopsy revealed agangliosis of the lower rectum and the patient was referred to our department. The patient underwent a three-staged Duhamel Martin operation without any major postoperative complication. Sixteen years later he has a normal social life, he has a bowel movement every other day and his sexual function remains normal

Case 3

A 38-year-old woman with a borderline intellectual functioning had a lifelong history of constipation, pseudodiarrhoea and fecal impaction. She was managing her symptoms with increasing amounts of cathartics or enemas.

After a severe episode of abdominal pain and vomiting she was admitted to our department. Physical examination revealed a distended and sensitive abdomen whereas plain x-rays were suggestive of sigmoid volvulus. Based on these findings we have decided to operate the patient. At laparotomy the large bowel was found to be distended and hypertrophied in such an extent

that could not be ascribed to incomplete volvulus. The findings were suggestive of congenital megacolon. The sigmoid loop was untwisted and full thickness bowel biopsies were taken from various bowel segments. Due to her mental status a decompressive colostomy was avoided. Biopsies revealed complete agangliosis of rectum and confirmed the diagnosis of congenital megacolon.

Two months later we performed the definite Duhamel-Martin operation in one stage, avoiding a protective transverse loop colostomy. Postoperative course was uncomplicated and the patient left the hospital the twelfth postoperative day. Twelve years later the patient is fully continent of both flatus and faeces and has one to two stools daily.

Surgical Technique

In all three cases we performed the Duhamel-Martin operation completely with mechanical sutures.

The patient is placed in the Lloyd Davis position and the abdomen is approached through a midline incision. After mobilization of the left colon, a part of the distended sigmoid colon is resected. The rectum is drawn up into the abdomen with stay sutures and a path is made behind the rectum by blunt dissection down to the pelvic floor (fig 2a). The circular stapling instrument (EEA) is introduced through the anus and the tip of the central rod is brought out through the posterior part of the anal canal just above the dentate line and the internal sphincter (fig 2b). The EEA anvil is positioned into the free end of the colon and the opening is secured with a purse string suture (fig 2c). The proximal colon is guided behind the rectum, the EEA anvil is fastened to the central rod (fig 2d) and a circular anastomosis between the lower posterior rectal wall and the proximal colon takes place (fig 2e).

Upon completion of the lower anastomosis, the anterior wall of the colon is divided transversely at an appropriate level (fig 2f) to allow an end to side anastomosis of the rectum to the colon. Through the openings of the upper rectum and colon the arms of the linear anastomotic instrument (GIA) are placed and the instrument is activated (fig 2g). Such a way the colorectal wall between the circular anastomosis and the central colon opening is divided and sutured (fig 2h), creating the neorectum. In almost



Figure 2. The Duhamel-Martin operation with mechanical sutures (a - i)

all cases it is necessary to reinsert the GIA in order to completely divide the colorectal septum (fig 2i).

The operation is completed by creating manually, a side to end anastomosis between the central opening of the rectum, and the opening in the anterior wall of the colon. Manual closure is preferred to a stapled closure, to avoid any narrowing of the channel.

The created neorectum and the staple lines are shown in figures 3 and 4 respectively.

DISCUSSION

Hirschsprung's disease although rarely seen in adolescents and adults, remains a challenge for the surgeon. Various surgical procedures have been proposed such as the Swenson procedure, the Soave operation, the Duhamel operation, rectal myectomy, anterior resection and total colectomy. Of these operations the Duhamel³ procedure was widely accepted especially in cases characterized by a discrepancy in size



Figure 3. Postoperative barium enema showing the created neorectum



Figure 4. Postoperative plain abdominal film showing the staple lines in the neorectum

between the normal and aganglionic segment of the colon⁴. The operation permitted the avoidance of extended pelvic dissection and consequently the possibility of sensory nerve damage. Major disadvantage of the Duhamel procedure was the frequent occurrence of fecaloma. Martin⁵ who proposed a side-to-side anastomosis between the rectal stump and the anterior wall of the normal bowel solved the problem of the blind rectal pouch and fecaloma formation. The method very soon became a highly acceptable procedure for the management of adult Hirschsprung's disease^{2-3,6-8}, but the use of a crushing clamp through the anus that had to stay in place for a week or more constituted a major disadvantage of the method.

In the cases that we have presented, we performed the Duhamel – Martin operation entirely with mechanical sutures. We performed only three such operations. Two patients underwent a decompressive colostomy before the definite operation (two stage operation) while in the third patient the operation was completed in one stage. All three patients had an uneventful recovery and the mean hospital stay ranged between 8 and 12 days. Seven to 16 years later the patients are fully continent of both flatus and feces and have at least one stool every alternate day. Their sexual function remains normal.

The difficult low rectal anastomosis with the aid of EEA stapler is easily completed and with the use of GIA stapler, crushing clamps are no longer necessary. Because of the avoidance of crushing clamps, the patient immediately postoperatively feels more comfortably and the mean hospital stay is minimized.

As we have noticed, the operation is completed by creating, a side to end anastomosis between the central opening of the rectum, and the opening in the anterior wall of the colon. We prefer a manual instead of a stapled closure in order to avoid any narrowing of the channel.

Although there are many reports in the literature for performing the Duhamel operation with mechanical sutures in infants⁹⁻¹¹, only sporadic cases for this type of operation in adults have been published¹¹⁻¹³.

We believe that despite the limited number of patients operated upon by this procedure, the use of mechanical sutures makes the Duhamel–Martin operation easier and can be safely performed by every sufficiently experienced surgeon.

ΠΕΡΙΛΗΨΗ

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Η χειρουργική επέμβαση Duhamel-Martin χρησιμοποιείται ευρέως για την αντιμετώπιση της νόσου του Hirschsprung των ενηλίκων. Σκοπός της εργασίας είναι η παρουσίαση της τεχνικής της επέμβασης με την χρήση αποκλειστικά μηχανικών ραφών. Πραγματοποιήσαμε την επέμβαση σαν απλή ή σταδιοποιημένη τεχνική σε τρεις ασθενείς. Δεν παρατηρήθηκαν μεγάλες μετεγχειρητικές επιπλοκές και τα μακροχρόνια αποτελέσματα ήταν ικανοποιητικά. Η χρήση των μηχανικών ραφών στη χειρουργική επέμβαση Duhamel-Martin καθιστά την τεχνική της απλούστερη, το συνολικό χρόνο της καθώς επίσης και την ενδο-νοσοκομειακή νοσηλεία συντομότερους. Η τεχνική αυτή συνιστάται για κάθε περίπτωση νόσου του Hirschsprung των ενηλίκων.

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