Complications of the two major operations of Hirschsprung's disease: a single center experience

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This study was designed to determine and compare the results of the Duhamel and Swenson procedures. The hospital records of patients who had undergone the Swenson or Duhamel operation over a 17-year period were reviewed and the patients were contacted for a final evaluation. The early and late complications of these operations were defined and compared. It was determined that the Swenson operation had been performed in 138 patients and the Duhamel in 59. Among the various complications, such as wound infection, dehiscence, anastomotic leak, adhesive intestinal obstruction, pelvic abscess, intraabdominal abscess, mucosal prolapsus, anastomotic stricture and fistulas, only the anastomotic stricture showed significantly higher percentages in patients who had undergone the Swenson procedure. When urinary incontinence, enterocolitis, soiling and constipation were considered, there was no significant difference between these two groups. There was one death in the Swenson group and none in the Duhamel group. The authors suggest the Duhamel operation as a simpler and safer method for the treatment of Hirschsprung's disease.

Key words: Hirschsprung's disease, Duhamel pull through, Swenson pull through, complications.

Hirschsprung's disease was first presented by Harold Hirschsprung in 1886[1,2]. Although many operations had been suggested for the treatment of the disease, the first successful surgical approach was described by Swenson and Bill[3] in 1948. Since then several operations have been developed but there is still controversy as to the best procedure. Operations and modifications of these have been introduced with better results[4-8]. Complications and complication rates of these operations have been reported in different series[9-18]. The purpose of this study was to compare the results of the Duhamel and Swenson operations of Hirschsprung's disease through a single center experience.

Material and Methods

One hundred and thirty-eight Swenson and 59 Duhamel operations performed in the Department of Pediatric Surgery Hacettepe University Children's Hospital over a 17-year period were retrospectively reviewed to compare the early and late complications and the final results of the two major operations of Hirschsprung's disease.

The diagnosis of Hirschsprung's disease was based on barium enema and confirmed by full-thickness rectal biopsy through the absence of ganglion cells. The patients had initially undergone a colostomy procedure. The timing of the definitive operation was based on 1) general condition of the patient, 2) distal colonographic findings, and 3) age of the patient. The Swenson operation[3,19,20] was performed in 138 patients and the Duhamel operation[5,6] in 59 patients. The Duhamel operation was initially performed using crushing clamps. Subsequently, 36 patients underwent Duhamel operation with staplers.

Patients were evaluated for the presence of 1) wound infection, 2) dehiscence 3) anastomotic leak, 4) adhesive intestinal obstruction, 5) sepsis, 6) pelvic abscess, 7) intraabdominal abscess,

8) mucosal prolapsus, 9) anastomotic stricture, 10) fistula formation, 11) incisional hernia, 12) urinary incontinence, 13) enterocolitis, 14) soiling, 15) constipation and 16) mortality. Since some patients were recorded as lost to follow-up, a questionnaire was mailed to these patients including enquiries on 1) urinary incontinence, 2) enterocolitis, 3) soiling, 4) constipation and 5) other complaints. They were requested to come for a final evaluation and, if not possible, to answer the questionnaire.

Data was analyzed using chi-square test and Fisher's exact test with Yates' continuity correction, and p values less than 0.05 were considered significant.

Results

Eighteen female and 120 male patients had undergone Swenson operation and 12 female and 47 male patients had undergone Duhamel operation. In the Swenson group the age distribution of patients at operation was as follows: 8.8% below 15 mo, 55.5% between 16 mo-3 years, 31.4% between 4-11 years, and 4.4% above 12 years, The age distribution in the Duhamel group was 20.3% below 15 mo, 66.1% between 16 mo-3 years, 11.9% between 4-11 years, and 1.7% above 12 years.

In our series wound infection was detected in 23 patients (16.7%) who had undergone Swenson operation and in four patients (6.8%) who had undergone Duhamel operation (Table I). Dehiscence was detected in 12 patients in the Swenson group (8.7%) and in one patient in the Duhamel group (1.7%). Sepsis was encountered in seven patients (5.1%) in the Swenson group and one patient (1.7%) in the Duhamel group. While anastomotic leak was encountered in seven patients (5.1%) in the Swenson group, no leak was detected after the Duhamel operation. Adhesive intestinal obstruction was observed in 13 paitents after the Swenson operation (9.4%) and in two patients (3.3%) after the Duhamel operation. Ten patients in the Swenson group and two patients in the Duhamel group required adhesioloysis. Pelvic abscess developed in nine patients (6.5%) in the Swenson group and in one patient (1.7%) in the Duhamel group. Intraabdominal abscess was detected in four patients (2.9%) in the Swenson group and in one patient (1.7%) in the Duhamel group. Mucosal prolapsus was detected in one patient (0.7%) in the Swenson group but in none of the Duhamel group. Anastomotic stricture was one of the most common complications in the Swenson group, appearing in 29 patients (21.2%). This complication was detected in only two patients (3.4%) in the Duhamel group ($p < 0.05$). In three patients (2.2%) in the Swenson group, fistulas were detected, namely rectovaginal, ileorectal and ileorectal + perineal. No fistula was detected in the Duhamel group. Incisional hernia was detected in one patient (0.7%) in the Swenson group and in one patient (1.7%) in the Duhamel group.

Table I. Early and Late Complications of the Swenson and Duhamel Procedures

Complication	Swenson	Duhamel
Wound infection	16.7% (138/23)	6.8% (59/4)
Dehiscence	8.7% (138/12)	1.7% (59/1)
Anastomotic leak	5.1% (138/7)	– (59/0)
Adhesive intestinal obstruction	9.4% (138/13)	3.3% (59/2)
Pelvic abscess	6.5% (138/9)	1.7% (59/1)
Intraabdominal abscess	2.9% (138/4)	1.7% (59/1)
Mucosal prolapsus	0.7% (138/1)	– (59/0)
Anastomotic stricture	21.2% (138/29)	3.4% (59/2)
Fistula	2.2% (138/3)	– (59/0)
Incisional hernia	0.7% (138/1)	1.7% (59/1)
Urinary incontinence	1.4% (74/1)	11.4% (35/4)
Enterocolitis	26.1% (88/23)	20.8% (48/10)
Soiling	35.2% (71/25)	18.9% (37.7)
Constipation	1.2% (84/1)	2.6% (39/1)
Death	0.7% (138/1)	– (59/0)

• The numbers in parenthesis denote (total number/evaluated).

Late complications were evaluated through follow-ups taken from charts, and patients lost to follow-up were called back for an evaluation. Twenty-eight patients in the Swenson group and 20 patients in the Duhamel group either responded to a questionnaire or came for a control visit. This data was combined with the data obtained from hospital charts to evaluate the late complications. Urinary incontinence (enuresis nocturna) was the complaint of one patient in the Swenson group (1.4%) and of four (11.4%) in the Duhamel group. One patient in the Swenson group and one patient in the Duhamel group had periodic micturition problems. Enterocolitis was detected in 23 patients (26.1%) in the Swenson group and in 10 patients (20.8%) in the Duhamel group. Soiling was the complaint of 25 patients (35.2%) in the Swenson group and of seven patients (18.9%) in the Duhamel group initially. But soiling was permanent in only 12 patients in the

Swenson group and in one patient in the Duhamel group. Even in this group toilet training and loperamide treatment were beneficial. Constipation was detected in one patient (1.2%) in the Swenson group and in one (2.6%) in the Duhamel group. There was only one death in our series, after the Swenson operation, which was due to pelvic abscess and sepsis.

Discussion

In a multicentric study of the Duhamel operation, in 2.2% of cases anastomotic leak was reported following the procedure[8]. No anastomotic leak occurred after the Duhamel operation in our series. In the survey of the Surgical Section of the American Academy of Pediatrics (SSAAP), occurrence of anastomotic disruption was investigated and was 11.2% after the Swenson operation and 2.4% after the Duhamel operation[12]. In a multinational retrospective study of the Swenson operation, anastomotic leak was detected in 5.6% of Swenson procedures, which is in concordance with our results. Anastomotic stricture was reported to be higher in the Swenson operation (13%) than in the Duhamel operation (2%)[13]. In a multicentric study of the Duhamel operation, anastomotic stricture was detected in 0.7% of cases[8]. In our series anastomotic stricture occurred more frequently after the Swenson operation. The results of other series support this.

Micturition disturbances were reported in 4% and 12% of cases in the Duhamel and Swenson operations, respectively[13]. The incidence of urinary incontinence appeared to be high in the Duhamel group, but the ages of three patients in this group were below four, and the problem resolved during follow-ups in this group. Swenson reported soiling occurrence as 3.2% in his series[17]. We oserved that soiling may be present in higher percentages soon after the operation but that it subsides with time and conservative treatment even in school-aged children. Satisfactory results may be obtained with loperamide treatment and toilet training in some patients.

In the SSAAP survery, enterocolitis appeared in 5.9% and 15.6% of the patients after the Swenson and Duhamel procedures, respectively[12]. Enterocolitis was detected in 33.7% and 13.9% of the patients who had undergone Swenson and Duhamel operations, respectively, in another series from Japan[11]. In the present study enterocolitis appeared to be a major problem in the treatment of Hirschsprung's disease as well. Moore et al.[13] reported constipation as a major complication of the Duhamel operation. They reported constipation in 26% of cases after the Duhamel operation and in 17% after the Swenson operation. Another series revealed a constipation rate of 8.1% after the Duhamel operation[8]. We detected lower percentages than reported in these series.

Grosfeld et al.[10] reported no operative mortality after the Duhamel operation. Sherman et al.[16] reported a 1.3% mortality between 1979-1989 with the Swenson operation. In the survey of the members of the SSAAP, overall mortality rates of 2.5% and 1.8% were detected after the Swenson and Duhamel operations, respectively[12]. In a multicentric study, 1.6% mortality was detected after the Duhamel operation[8]. There was no mortality in our series after the Duhamel procedure.

Based on our comparison of the two procedures, we suggest the Duhamel procedure is a simpler and safer method for the treatment of Hirschsprung's disease.

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