Laparoscopic pull through for Hirschsprung’s disease in infants

Juda Z. Jona

Division of Pediatric Surgery, Evanston Northwestern Healthcare, 2650 Ridge, Evanston, Illinois - 60201, USA
Correspondence: Juda Z. Jona, E-mail: jzj233@northwestern.edu

ABSTRACT

Purpose: To report personal experience with Primary Laparoscopic Pullthrough Procedure (PLPP) in infants with Hirschsprung’s Disease (H.D.).

Materials and Methods: Sixty four PLPP were performed by the author. In addition, 17 assisted LPP were done but not reported herein. The patients’ personal and anatomic data were typical for babies with H.D.

Results: Average age at operation was seven weeks (range 1-28 weeks). Operative time for PLPP averaged 140 minutes. Two babies required conversion to a standard laparotomy for anatomic reasons (long segment). Average blood loss was <5 ml. No intraoperative nor immediate post operative complications were seen. Hospitalization was short (2-3 days). Two had mild diarrhea episodes which improved without hospitalization. Another child developed a severe problem with enterocolitis 3½ years following the operation. In general, stool habits fell within the normal range for those > 4 years of age.

Conclusion: PLPP is an effective, problem free approach for treating neonatal H.D. It has replaced the standard two stage open procedure in babies with uncomplicated presentation.

KEY WORDS: Hirschsprung’s disease, Laparoscopic pullthrough, Infancy

INTRODUCTION

Minimally invasive surgery (MIS) has now been applied to many abdominal, thoracic and, in some instances, also for cervical operations. Georgeson[1,2] was one of the earliest surgeons to champion this approach for the treatment of neonatal H.D., showing that the abdominal phase of the colo-anal resection could be carried out via a laproscope safely, rapidly and with minimal complications. Personal experience with PPLP in neonates with H.D. is hereby recounted.

MATERIALS AND METHODS

The study period encompassed the years 1993-2004 (Table 1a). Of a total of 81 patients, there were 64 PLPP and 17 assisted LPP (8 with preexisting colostomy and 9 with newly created colostomy). Of the entire group, 74% were boys and 26% were girls, ranging in age from newborn to 8 years old. The PLPP group (N= 64) comprise the essence of this report.

The details of the operation have been previously reported.[1-3] Preoperative bowel prep i.e., mechanical cleansing, clear liquids, oral Neomycin and broad spectrum intravenous antimicrobial (Ampicillin and Gentamycin) coverage were all instituted. Patients positioning and port locations were all standardized. The most common port sizes that were used were 3.5 and 5 mm. The RLQ port (5 mm) should permit insertion of various dissecting instruments, Harmonic scalpel[4] and Ligaclip applicator. The abdominal phase involved colo-rectal dissection following the principles described by Swenson in numerous reports.[5] Visual inspection of the bowel and histologic examination of a seromuscular biopsy establish the site to be pulled through (usually 1-2 cm proximal to the zone of transition). The rectoanal dissection is carried out in a retrograde fashion through a transanal muscosectomy (reversed Soave approach). Oral feedings began in under 24 hours in most babies. Post operative antibiotics were given for approximately 48 hours.
The majority of the operations were carried out in two Midwestern pediatric surgical centers (Children’s Hospital of Wisconsin-Milwaukee and Children’s Memorial Hospital – Chicago). In addition, several procedures were done for the purpose of instruction in some US, European and Asian countries.

For demographic details of the 64 PLPP see Table 1b. All babies, once diagnosed, were maintained on colonic evacuations by means of routine N/S rectal irrigations. Those who could not be properly decompressed (N=7) or experienced perforation (N=2) underwent urgent leveling colostomy and later had assisted LPP. In most instances, given reasonably intelligent and responsible parents, home irrigation was easily taught and the babies presented for resection once 500-1000 gm weight gain was realized. While on home irrigations, no babies in this group had to be readmitted urgently for enterocolitis or perforation (Table 2). In some situations, the babies were kept in the hospital and underwent PLPP in less than a week following the diagnosis. (Table 2)

RESULTS

The average time of operation was 140 minutes (120-240). Two required open conversion for anatomic reasons (right transverse colon and total colonic H.D.). No patient experienced injuries to adjacent organs (ureter, bladder, vas deferens) nor any had uncontrolled bleeding or required a transfusion. Average blood loss was <5ml.

There were no post operative infections, no early occurrence of enterocolitis and no incidents of appendicitis. Oral feeding began after 12-24 hours and most babies were discharged within 48-72 hours (mean of 59 hours) after operation. Pain management was simple and, in most, required non-opiate analgesia only. Epidural injection which was found to be a good adjunct, was left to the anesthesiologist’s discretion.

No baby required readmission for enterocolitis, bowel obstruction or port site herniation. Two patients experienced mild and transient diarrhea episodes which were treated by conventional modalities (diet) without resorting to irrigations or hospitalizations. Two additional babies required digital anal dilatation as an office procedure on two and four occasions. All patients exhibited normal growth and development.

No urinary problems or incontinence was seen in any patient. For most of those older than 4 years of age, full stool control was achieved. Occasional nocturnal enuresis was seen in a few children, which seemed to improve with age. Accidental soiling was also seen mostly in those with Down’s syndrome or long segment disease. A single Down’s syndrome patient developed severe problems with enterocolitis 3½ years following his operation. He did not have anal stenosis nor absent ganglia from his distal rectum on biopsy. Symptomatic management caused him to improve over 1½ - 2 years.

DISCUSSION

In the past 15 years, MIS and especially laparoscopic procedures have gained strong footing in the armamentarium of most pediatric surgical centers. With special attention to details, especially anesthesia, thoracoscopic and laparoscopic procedure can be carried out in neonates and infants with a great measure of safety and effectiveness.

Experience has conclusively shown that PLPP in neonates and young infants with H.D. is safe, free of complications and relatively pain free. It has been labeled - a new gold standard. The need for preliminary colostomy is eliminated in most babies. The recovery from the operation is prompt and the hospitalization shortened. Above all, it seems that functional parameters indicate superior results; in great part because resection and reconstruction is done in the neonatal period.

Several recent studies indicated that in the majority of babies with H.D., successful pull-through operations can be done entirely from the anal approach (in a retrograde fashion). The author reserves this approach for patients with known short or ultra short segment H.D. in whom the abdominal disease is minimal. For the majority of babies with rectosigmoid transition, the laparoscopic abdominal approach provides secured histologic leveling by means of intraoperative biopsy and in addition better control of the inferior mesenteric circulation to the bowel. This adds a measure of safety which is not fully expressed.
The learning curve for PLPP is rather short and flat. The visualization of all pelvic organs is superb, thus aiding in avoidance of bleeding or injuries to adjacent organs. Most trained pediatric surgeons can acquire proficiency after 3-5 operations.

REFERENCES