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ORNAC Elections - June 1999

Preparations are under way for elections of ORNAC Executive positions for President Elect, Treasurer, and Secretary. Elections will take place at the June, 1999 Board meeting in Halifax.

At the ORNAC Board of Directors meeting, November 8, 1998 in Montreal, the Board and Executive Eligibility Criteria and Eligibility List were confirmed. Timelines for nomination process are set.

Having served on the Board of Directors, the eligible candidates have gained valuable experience and understanding of the responsibilities in letting their name stand for office. In the March/April 1997 Journal edition I wrote "we have been fortunate that so many operating room nurses have been willing to be actively involved. The success of ORNAC can be attributed to their knowledge, ability and commitment". The Nominating Committee now looks forward to many nurses to continue to take the challenge to serve the Association and lead us into the new century.

Look for the slate of nominees and biographical information in the spring edition of the Canadian Operating Room Nursing Journal.

For information regarding the eligibility criteria, eligibility list, and/or election process contact your Provincial ORNAC Board member or ORNAC Executive (listed on page 2 in the Journal), or myself at: 4421 Rainforest Drive, Gloucester, ON K1V 1L5.

Vija Hay
Past President, ORNAC
Chair, Nominating Committee

Laparoscopic Swenson Pull-Through Procedure for Hirschsprung's Disease

By Leonore Arany, Kathleen Jennings, Katherine Radcliffe & Joanne Ross

In October of 1995, the Laparoscopic Swenson Pull-through Procedure was introduced in our operating room to surgically treat Hirschsprung's Disease. As with any new procedure a multidisciplinary team approach is needed to prepare the Operating Room, determine the instrumentation and equipment required and to educate the staff about the procedure. This article describes Hirschsprung's Disease, the perioperative nursing care required and operative technique of a Laparoscopic Swenson Pull-through Procedure.

Pathophysiology

Congenital megacolon or Hirschsprung's Disease is caused by an absence of the parasympathetic ganglion cells of the myenteric plexus of the colon. The parasympathetic ganglion cells control the movement of bowel contents by coordinating contraction and relaxation of the bowel wall. The absence of these cells prevents the normal peristaltic movement of fecal matter through the bowel leading to intestinal obstruction or severe constipation. The bowel becomes distended proximal to the affected portion of the bowel. The segment of bowel affected by this disease is variable in length but usually involves the rectum.

Abstract

The introduction of a new procedure into the operating room is always a challenge that requires careful planning and teamwork. This article describes the pathophysiology of Hirschsprung's Disease, the perioperative nursing care required and the operative technique of the Laparoscopic Swenson Pull-Through Procedure.

The incidence of Hirschsprung's Disease is estimated at 1 in 5,000 births. There is some evidence that suggests males more than females are affected by this disease.

Clinical Manifestations and Diagnosis

In neonates the classic symptom is delayed passage of meconium. Meconium is usually passed within the first 24 to 48 hours after birth. Infants can present with the signs and symptoms of a bowel obstruction, i.e. abdominal distention, green vomitus and dehydration. If untreated, perforation of the bowel and septicemia can result. Infants and older children may present with constipation or infrequent stools, abdominal distention, poor appetite and little weight gain. Enterocolitis is a complication of Hirschsprung's Disease and may be the first clinical sign. The patient presents with fever, abdominal distention and diarrhea, which can be explosive, malodorous and bloody.

The most reliable diagnostic test is a rectal biopsy. A full thickness rectal biopsy, punch biopsy, or a suction biopsy technique may be used. A full thick-

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ness rectal biopsy must be performed under a general anesthetic whereas the later two techniques may be performed on an awake and cooperative patient. A Barium enema is used to identify the transition zone that is apparent in patients with congenital megacolon as well as to assist in ruling out other causes of the bowel obstruction. The transition zone is the cone shaped area seen extending from the proximal dilated colon to the nondilated distal aganglionic colon on the Xray film.

Preparation of the O.R. Room

Three nurses are assigned for this procedure, two of whom must be registered nurses. A scrub nurse is required for the abdominal part of the procedure and a second scrub nurse is required later for the perineal part of the procedure. The second scrub nurse will assist one of the Registered Nurses with the circulating nurse duties until needed. At the McMaster Site of the Hamilton Health Sciences Corporation, an OR room is designated for pediatric surgery. This room is one of the largest rooms in our OR suite and is decorated in soft colors with cartoon and Sesame Street characters on the walls. This assists in creating a soothing and non-threatening environment for our pediatric patients. A large room is required to accommodate the special anesthetic and surgical equipment required for this procedure (Table #1 Pediatric Anesthetic Equipment and Supplies). The room temperature is increased to 24 - 26 degrees Celsius before the patient is brought to the room. It will be lowered after the child has been prepped and draped if his/her temperature is within the acceptable range. All equipment required for the procedure must be placed in the appropriate location and checked to ensure proper functioning prior to the child being brought to the room. (See Diagram #l) The head and foot sections of the OR table are lowered to provide access for the anesthetist and surgical team. A warming device is placed on the OR table and will continually provide warm air flow as well as providing padding to the vulnerable areas of the body. The child is laid directly on top of the air-flow warming blanket. The warming machine is placed on the base of the OR table.

The video and camera system is positioned on the left side of the OR room close to the wall initially. It will be moved within a few feet of the OR table after the patient has been positioned. The suction apparatus and electrocautery machine are positioned at the top right corner of the OR table close to the anesthetic machine and automatic blood pressure machine. The foot pedal of the electrocautery is placed by the surgeon's right foot once the patient has been prepped and draped. The sterile instrument table is set up at the end of the room where there is space to prevent accidental contamination during positioning etc. This table is for the abdominal laparoscopic portion of the procedure. A second table for the second or perineal stage of the procedure is set up to the right of the OR table. (Table #2 Instruments and Sterile Supplies). All positioning devices are gathered, prepared and placed within easy reach. (Table #3 Positioning Devices). The scrub and circulating nurses complete a separate count of sponges, instruments, needles and designated miscellaneous items contained on each table. The scrub nurse checks all instruments to ensure that they are in proper working order, especially the insulated laparoscopic forceps. This is important, as a break in the insulation may cause an electrical burn.

Table #l
Standard Pediatric Anesthetic Supplies and Equipment

- 2 Pediatric laryngoscope handles
- 2 ea 0,#1, #2, #3 MAC laryngoscope blades
- 2 Pediatric Mouth Suctions
- 2 ea 0, #1 Miller laryngoscope blades
- 2 Pediatric Intubating Stylets
- 2 Pediatric Magil forceps
- 2 ea #5 & #8 Suction Catheters
- 3 ea 000, 00, 0, 7 ,8 Oral Airways
- Uncuffed Endotracheal Tubes, 2.5mm up to 6.5 mm
- Anesthetic Masks, 2 ea sizes 0, 1, 2, 3
- Angiocaths, Sizes #20, 22, 24, 26
- Assorted L.L. Syringes lcc,3cc,5cc,10cc,20cc
- Pediatric Anesthetic Bellows
- Pediatric size Breathing Circuit
- 1 litre rebreathing bags
- Small Eye Pads
- 2" Kling and IV armboards
- Pediatric Filters
- Pediatric Stethoscope
- Feeding Tubes #5 & #8 (2 ea.)

Preoperative Phase

During the time between diagnosis and the surgery date, the parents are taught to keep the child's bowel decompressed with warm saline rectal irrigations. On the day prior to surgery, Pedialyte is given ad lib and mechanical preparation of the bowel is accomplished with magnesium citrate (4 -5 ml/kg/dose) three times daily.

The patient is brought to the patient receiving area usually accompanied by their parents. An intravenous solution of 0.9% Normal Saline or D5W/o.45% Saline is started on the inpatient unit prior to the patient coming to the OR and Gentamycin 5 mg/kg and Metronidazole 10 mg/kg are given. The Registered Nurse assigned in the OR patient receiving area introduces herself to the patient and parents. An explanation of the sequence of events is given at this time. The chart is reviewed for the usual preoperative requirements (signed consent, history and physical, etc.) As the patient is unable to verbalize answers to questions, the RN asks the parents questions regarding NPO status and known allergies and the surgical procedure to be performed.

The anesthetist assesses the patient and answers any questions the parents may have regarding the anesthetic to be given. The surgeon visits the patient and parents in the receiving area and answers any last minute questions and tells the parents that he will speak with them in the family waiting room after the procedure.

Table #2
Instruments and Sterile Supplies

Abdominal Set Up

major linen pack & laparotomy basin set
opsite strips
laparotomy sheet
3 surgical gowns & appropriate glove sizes
minor pediatric instrument tray
fibroptic light cord
30 degree 5 mm pediatric laparoscope
allport 5 mm clip applier
Step SL 75 5mm Cannula and Dilator with Radially Expandable Sleeve
Insufflation &Access Needle
antifogging solution
1cc syringe and 25g needle
drape for camera head and cable
suction tubing
Ratex Sponges 5/package
1/2" steri strips and 5-0 Monocryil
small needle board
catheter tray and catheter (#6 or #8)
irrigation tubing
#15 scalpel blade
5 mm Pediatric Laparoscopic Instrument Tray
3.5 mm Pediatric Laparoscopic Instrument Tray *(for smaller patients)*

Perineal Set-Up

- minor basin set
- major linen pack
- hand control cautery &needle tip
- guard for cautery tip
- Scabbard
- minor pediatric instrument tray
- 5 babcock forceps
- 5 small towel clips
- langenbach fine retractors
- Hagar dilators
- Sterile lubricant
- 5 curved mosquitos
- Ratex Sponges 5/pkg
- # 15 scalpel blade
- 3-0 or 4-0 Vicryl sutures (uses approximately 12)
- large needle board)

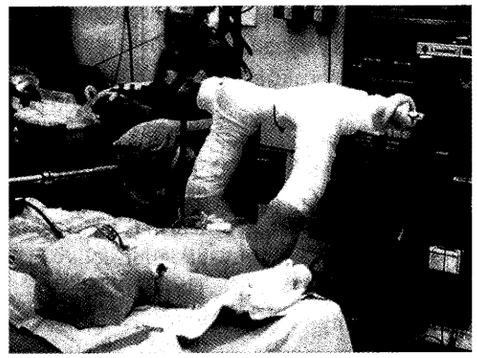
Intraoperative Phase

After receiving a report from the patient receiving nurse and reviewing the patient's chart, the primary circulating nurse introduces herself to the parents and patient. Due to the patient's age (usually less than 12 months), parents are not permitted to remain with the child during induction of the anesthetic.

Once in the OR room the child is placed on the OR table in the supine position and monitoring devices are applied. The ECG pads (pediatric size) are positioned on the chest, the appropriate size of blood pressure cuff is placed on the child's right arm and two pulse oximeter probes are applied, usually one on each thumb. The probe opposite to the arm with the blood pressure cuff is connected to the pulse oximeter monitor. The second probe is applied to facilitate a quick change if the anesthetist is concerned about the patient's oxygen saturation level during the surgical procedure. For the induction phase of the anesthetic, a probe may be applied to the child's foot but must be removed prior to positioning. The circulating nurse assists the anesthetist with preoxygenation of the patient and endotracheal intubation.

Table #3
Positioning Devices

- 2 universal holders
- 2 anesthetic bars 1 padded with eggcrate foam)
- 3" Soft roll or Webril (2-4 rolls)
- 4"flannel bandage (2)
- 6 egg crate foam pads
- roll of lap padding
- micropore tape



Once the anesthetist has confirmed the position of the endotracheal tube and taped it into position, a second IV line may be established if required. The anesthetist applies eye pads to the patient's eyes to prevent an accidental injury. A #6 urethral catheter is inserted into the bladder. Waterproof tape is used to secure the catheter to the upper thigh to prevent accidental removal of the catheter. Continuous drainage of the bladder is required to provide good visualization of the pelvis and measurement of urine output during the procedure. *See Fig* 1. ⇑

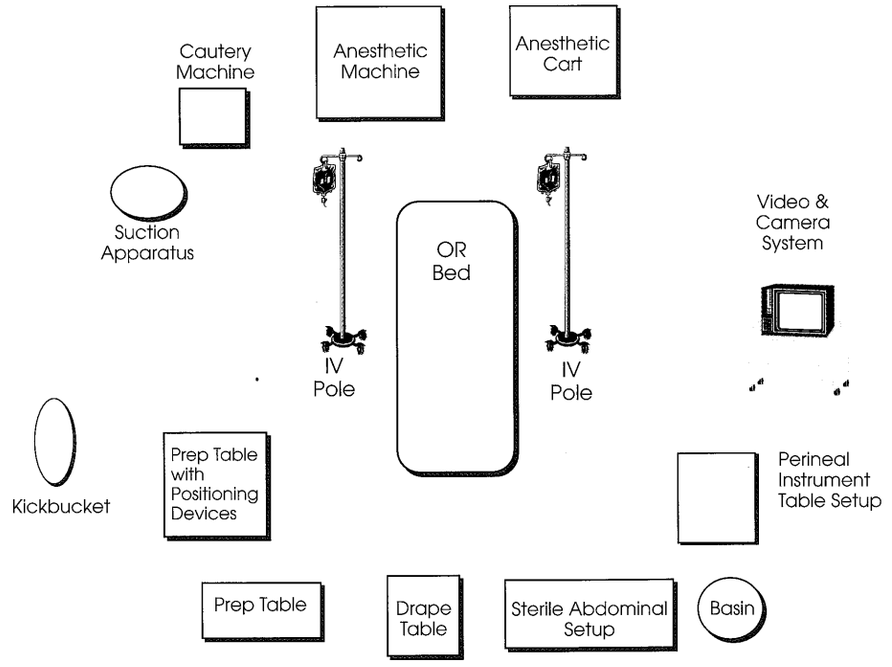
Positioning

The patient is moved down to the bottom end of the OR table and positioned transversely with the patient's right side to the end of the table. Care is taken to ensure that the anesthetic tubings, monitoring and IV lines are free before the patient is moved. The patient's head is placed on a gel filled donut and turned to the left. A check is made by the circulating nurse to ensure that the pinna of the left ear is not folded over on itself. A foam pad is placed over the child's face for added protection. A padded anesthetic bar is attached and positioned parallel to left the side of the OR table. The patient's buttocks are positioned at the edge of the mattress. An incontinence pad is placed under the patient's buttocks to prevent soiling. Using soft roll and flannel bandages the patient's feet and lower legs are secured to the padded bar. Care is taken not to occlude blood flow or compress any of the nerve supply to the feet or lower legs.

A second anesthetic bar is attached to the OR table and positioned at right angles to the padded anesthetic bar. This provides the anesthetist with access to the IV and monitoring lines and to the patient's face. It also prevents the drapes, cords and tubings from laying on the patient's face and upper body. Padding is placed under each elbow. Once positioning is completed the circulating nurse performs a head to toe check of the patient to ensure that correct body alignment has been maintained and that all bony prominences are padded.

An appropriate size electrocautery pad is applied to the patient, usually to the lower back.

Diagram #1 Room Set Up for Laparoscopic Swenson Pull-Through Procedure



Prepping and Draping

The circulating nurse applies the Proviodine prep solution to the patient's abdomen from the nipple line down to and including the perineum. A check is made to ensure that pooling of the solution has not occurred under the patient to prevent a chemical burn.

Once the prep is complete, the surgeon and scrub nurse begin the draping procedure. A draw sheet is placed under the patient's buttocks. Towels are placed on each side of the abdomen and across the chest and secured with towel clips. Towels are wrapped around each leg and the left anesthetic bar and secured with adhesive strips and towel clips. A laparotomy sheet is placed in the usual manner, bringing the lower end to the top of the anesthetic bar. Zimmer clips are applied to fasten the laparotomy sheet to both anesthetic bars.

Operative Technique

The video camera system is moved into position at the side of the OR table. The fiber-optic light cord and $C0_2$ insufflating tubing are passed off the sterile field to the circulating nurse for connection to the light source and insufflator. The camera system is connected to the telescope and a white balance check is completed to ensure correct color setting. The electrocautery cord and irrigating and suction tubings are passed off to the top of the OR table and connected appropriately by one of the circulating nurses.

A small incision is made in the right upper quadrant of the abdomen. Using a Radially Expandable Sleeve and an Insufflation and Access Needle (InnerDyneInc. Southmedic), the pneumoperitoneum is created by insufflation of $C0_2$ into the abdomen. The patient pressure setting is set at 12 mmHg initially. The flow rate is set at 1 litre per minute until confirmation of correct placement of the needle is made. The flow rate is then increased to 6 litres per minute. The insufflation needle is removed and a Step SL75 5mm Cannula and Dilator (InnerDyneInc. Southmedic) is inserted into the sleeve. A 30 degree 5 mm laparoscope can now be inserted through the enlarged sleeve. Under direct visualization 5mm trocar and cannula are inserted into left upper and right lateral abdominal incisions. In smaller patients, a 3.5 mm trocar and cannula can be used in the left upper quadrant port site. A suction irrigating apparatus is available for removal of any fluid that may be present in the abdominal cavity.

Using a 5 mm Endoscopic Allport Rotating Multiple Clip Applier (Ethicon) and laparoscopic babcock forcep and scissors, the mesenteric blood vessels are ligated and divided. A laparoscopic hook cautery is used for the smaller mesenteric and perirectal vessels. Dissection is carried out to the pelvic floor, mobilizing the sigmoid colon and rectum.

The colon is prolapsed out of the anus by inserting a sponge stick and applying downward traction. A second surgeon performs this maneuver. At this time a full thickness biopsy of the bowel is taken. The specimen is sent directly to pathology for examination to determine the presence of ganglion nerve cells. It is may be necessary to take more than one biopsy if ganglion cells can not identified in the first specimen. The circulating nurse indicates the location of the biopsy on the specimen label and pathology requisition as stated by the surgeon. Biopsies are sent in sterile jars without formalin. While waiting for the pathology report the patient pressure for the $C0_2$ insufflation is lowered to 6mmHg.

Once the pathologist determines that the biopsy shows ganglionic bowel, the bowel is resected at that level. Reanastomis is made using absorbable 3-0 Vicryl sutures (Ethicon). After the anastomsis is completed, Hagar dilators lubricated with Muko are inserted into the rectum to determine the size of the lumen of the anastomosed bowel.

Using the laparoscope, the abdominal cavity is visualized to determine the presence of tension and the anatomical position of the bowel and for any bleeding. If necessary, the abdominal cavity is irrigated using warmed 0.9% Normal Saline and then suctioned clear. The pneumoperitoneum is evacuated and all cannulas and instruments are removed. The incisions are approximated with 1/2 inch steristrips or 5-0 Monocryil (Ethicon). The tubings, light cord and camera are passed off to the circulating nurse and the final sponge and needle counts are completed for both of the sterile tables. The drapes are removed and the soft roll and flannel are removed from the patient's feet and legs, returning the patient to the supine position as quickly as possible. The child is turned and moved carefully to the head of the OR table to facilitate the safe removal of the endotracheal tube by the anesthetist. All monitoring devices remain on the patient until the anesthetist is ready to move the patient from the OR table. The electrocautery pad is removed and the site is assessed. The scrub nurse cleans the prep solution from the patient's abdomen, legs and perineum. An appropriate size diaper is applied. The circulating nurse remains at the head of the OR table with the anesthetist to assist with extubation and moving the patient to the crib.

The amount of blood loss and irrigation are noted by the circulating nurse and reported to the anesthetist. The circulating nurse completes documentation on the Operative Record.

Postoperative Phase

The anesthetist and surgical residents transport the patient to the Postanesthetic Care Unit (PACU). The anesthetist gives a report to the PACU registered nurse. Once the child is conscious, one of the parents is brought into the PACU to comfort the child until he/she is ready to be transferred to the pediatric ward. Once oral intake is resumed, usually within 1 to 2 days, the intravenous line is discontinued. The patient is discharged from the hospital in three to four days. A follow-up appointment with the surgeon is made for two weeks postoperatively.

Summary

The introduction of a new procedure into the operating room is always a challenge that requires careful planning and teamwork. Since we began performing this procedure, we have revised the care plan and reduced the amount of time required for preparation, patient positioning as well as the surgical time needed. ❐

Acknowledgment

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