Methods of Reconstruction After Proctectomy

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Introduction: adult rectum 12 to 15 cm long; length may increase by ≥5 cm during proctectomy; ulcerative colitis or radiation proctitis may decrease luminal compliance; replacement with relatively noncompliant length of colon during sphincter-sparing procedure may increase functional outcomes (increased bowel frequency, stool fragmentation, urgency, and fecal soiling and incontinence)

Colonic J pouch: in Swedish study of patients randomized to straight proctectomy or colonic J pouch, J pouch associated with fewer daily and nocturnal bowel movements 2 mo and 1 yr after surgery, fewer complaints of urgency, and lower fecal incontinence scores; after 1 yr, more patients with J pouch required daily medications to improve bowel function, but these patients also reported better quality of life; other studies suggest functional differences disappear over time; size of J pouch ranges from 5 to 12 cm; in Japanese study, 5-cm pouch associated with greater ability to expel rectal balloon, higher pressure generated during straining, and more saline evacuated over 5 min than with 10-cm pouch; pouch width expanded over 3, 12, and 24 mo (difference in pouch sizes increased over time); larger pouch associated with more evacuation problems, which led authors to conclude that smaller pouch preferable

Contraindications to pouch creation: colon too short to reach pelvic floor with J pouch; narrow pelvis (ie, inability to accommodate pouch); bulky sphincter or need for mucosectomy; diverticulosis; pregnancy

Coloplasty: first described in 1999; has narrower tip that allows device no longer available in United States; associated with ≤85% continence; pseudocontinent perineal colostomy—associated with ≤50% continence and good generation of pressure on anal manometry

Conclusions: reservoir creation after removal of rectum should be performed whenever possible; colonic J pouch associated with best function and quality of life; consider coloplasty or end-to-side anastomosis if J pouch cannot be created

Sexual and Urinary Function after Total Mesorectal Excision

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Neurologic injury during total mesorectal excision (TME): occurs at point of nerve coalescence or origin; sympathetic fibers—derived from thoracolumbar spine; in men, prevent retrograde ejaculation, allow emission of semen, and promote penile detumescence; role in women unclear; in men, parasympathetic fibers S2 to S4 cause erection through venous congestion and propulsion of semen from urethra; in women, cause venous engorgement and allow secretion of fluids into squamous epithelium

Sites and mechanisms of injury in men: anterior to aorta during high ligation of inferior mesenteric artery; point at which nerves come over pelvis at hypogastric vessels; region of rectovaginal fascia, especially if not incised sharply and pulled off sacrum; with anterior tumors, on prostate side of Denovilliers fascia at periprostatic plexus; overly wide ligation of lateral ligaments

Validated tools for evaluating sexual function: Female Sexual Function Index—consists of 19 items; scores range from 0 to 36; score <26 signifies severe sexual dysfunction; International Index of Erectile Dysfunction—includes 15 items in 5 categories; scored from 5 to 75; score <21 usually signifies erectile dysfunction (ED)

Sexual dysfunction in men: defined as difficulty getting or maintaining erection, impotence, or retrograde ejaculation; trouble starting urinary stream, incomplete emptying, or need for self-catheterization; 16% of men have problems preoperatively; patient factors may affect outcomes (may be difficult to stay in correct plane if, eg, patient overweight with narrow pelvis); rates of urinary dysfunction 30% to 70%, impotence,

Educational Objectives

The goal of this program is to improve outcomes associated with colorectal surgery. After hearing and assimilating this program, the clinician will be better able to:

1. Determine which reconstructive procedure is most appropriate for a given patient who has undergone proctectomy.
2. Advise patients about the risk for sexual dysfunction associated with total mesorectal excision.
3. Identify patients who may be poor candidates for restorative proctocolectomy.
4. Recognize alternatives to restorative proctocolectomy and their indications.
5. Evaluate the utility of simulators in surgical training.

Faculty Disclosure

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Sexual dysfunction in women: data scarce; vaginal dryness and dyspareunia often used as benchmarks (however, symptoms subjective and difficult to evaluate); preoperative radiation therapy associated with sexual dysfunction and increased vaginal dryness and dyspareunia; in study at Cleveland Clinic, sexual dysfunction in women most often associated with abdominoperineal resection (compared to low anterior resection), radiation therapy, intraoperative sepsis (leaks or pelvic abscess), and age >65 yr; in unrelated study, higher rates of dyspareunia and reduced orgasm secondary to decreased lubrication and arousal associated with rectal rather than colon surgery; higher rates of nocturia and stress urinary incontinence associated with pelvic TME surgery (particularly in patients with history of abdominal hysterectomy); in study by speaker and colleagues, women undergoing pelvic surgery had lower preoperative sexual function scores, compared to patients undergoing abdominal surgery; postoperative scores higher among premenopausal women and women on hormone replacement therapy; conclusion — pelvic surgery associated with high risk for postoperative female sexual dysfunction

Conclusions: male sexual and urinary dysfunction may be present preoperatively in 16% to 20% of patients; new urinary dysfunction after TME rare in men, but sexual dysfunction significant; risk factors include radiation therapy, age, stoma, and pelvic vs abdominal surgery; more data needed on effects of laparoscopic surgery; preoperative sexual and urinary dysfunction may also be present in women; postoperative dysfunction in women — documented but not definitively associated with TME; may include new urinary problems and increased dyspareunia; may be associated with deterioration in arousal and lubrication; risk factors include abdominoperineal surgery, age, radiation therapy, and stoma; data on effects of laparoscopic surgery virtually nonexistent

Restorative Proctocolectomy: Are the Other Surgical Options Still Options?

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Background: in 1970s, most patients at Cleveland Clinic with ulcerative colitis (UC) underwent total proctocolectomy with ileostomy; at that time, ileorectal anastomosis (IRA) only option for restorative surgery; concerns included function and risk for cancer; pelvic pouch procedure devised in late 1970s and had profound impact on practice; today, only small minority of patients with UC not good candidates for restorative surgery

Poor candidates for restorative proctocolectomy: patients who have functional concerns (eg, poor sphincter); morbidly obese patients; patients who fear complications; patients at risk for cancer; patients with Crohn disease misdiagnosed as UC; those with concerns about sexual dysfunction or infertility

Total proctocolectomy with end ileostomy: maximum resting sphincter pressure <40 mm Hg contraindicates pouch (not contraindicated by sphincter defect alone); total proctocolectomy with end ileostomy good choice if patient incontinent; also best option for patients with low rectal cancer involving sphincter, and for morbidly obese patients when pouch not anatomically possible

Total colectomy with IRA: less complex operation than restorative proctocolectomy; no pelvic dissection required; risk for morbidity may be lower, compared to pouch; 5-yr retention rate 80% (diminishes somewhat with time but still good ≤20 yr out); indications — stage 4 or clinical stage 3 colon cancer; concern for Crohn disease (relative rectal sparing, indeterminate colitis, warning signs such as perianal fistulas or skin tags); younger patient with concerns about sexual function and fertility (risk for sexual dysfunction associated with pouch actually small; incidence of retrograde ejaculation 5%-10%; risk for erectile dysfunction lower; risk for female sexual dysfunction and infertility well-documented; however, most patients report improved sexual function after pouch surgery)

Considerations: distensible rectum “absolutely mandatory”; requires that patient have only minimal active disease in rectum and no perianal or small bowel disease; probability of maintaining IRA decreases over time, but IRA should remain intact for ≥10 yr; risk for dysplasia and cancer of concern; cancer development associated with longer duration of UC and poor surveillance (annual rectal surveillance mandatory for patients with IRA)

Continent ileostomy: patient has flush stoma rather than appliance; pouch intubated several times daily; popularity waned after introduction of pelvic pouch; current indications include inability to achieve, or failure of, pouch-anal anastomosis, or inability to tolerate existing ileostomy; major drawback high rate of complications; slippage of nipple valve is “Achilles’ heel”; risk factors include obesity, patulous valve, and weak abdominal wall; slippage can occur months to years postoperatively

Techniques to prevent valve slippage: T-pouch; Barnett pouch; stapling of valve to itself and then to pouch side wall (currently used method)

Postoperative management: requires ≥1-wk hospital stay; patient goes home with catheter draining pouch for 1 mo, then returns to clinic to extubate pouch and start intermittent intubation program; patient then followed annually; obesity main predictor of failure; good quality of life reported; complications require multiple revisions due to slippage of nipple valve or development of fistulas

The Role of Simulation

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Rationale for simulation training: traditional training of residents subject to increased restraints; training in animal laboratories involves high costs and ethical issues, and consumes portion of limited allotment of time residents can spend in hospital

Models for simulation training: video-based (validity still untested); box trainers (underutilized; did not hold residents’ interest); virtual reality trainers (generate more enthusiasm; capable of validating differences between novice and expert)

Surgical skills addressed by simulators: handling of tools such as staplers; practicing cholecystectomy (eg, gaining familiarity with hepatobiliary anatomy); surgical preparation (shortens reaction time)

Robotic simulators: offer training on robotic console; help to shorten learning curve; have 32 training modules
Study by speaker and colleagues: used robotic simulator to evaluate performance of colorectal surgical fellows with essentially no experience in robotics (novices); outcome measures included volume of blood loss, number of objects dropped, economy of motion, excessive instrument force, number of instrument collisions, use of master workspace range, misapplication of energy, and length of procedure; overall score calculated using proprietary formula from manufacturer; in general, experts (≥100 robotic cases) obtained significantly higher scores than novices; experts scored higher on measures of economy of motion, instrument collision, time to completion, and master workspace range; no significant differences seen between experts and novices on volume of blood loss, broken blood vessels, instrument drops, instrument out-of-sight time, and misapplied energy; urologists have found that superior simulator performance by experienced surgeons translates into better performance on actual robotic system; effect on patient outcomes unknown; in colorectal surgery, procedure-based simulation lacking

Other uses for simulator: practicing or “warming up” before actual case so problems can be anticipated; training of residents and fellows; training for maintenance of certification; providing training to older surgeons who never received training in, eg, laparoscopy

Future needs: procedure-based simulation; interactive capabilities

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- Take posttest: 10 minutes
COLORECTAL CARCINOMA/RESTORATIVE PROCTOCOLECTOMY/SIMULATION

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To submit a test form by mail or fax, complete Pretest section before listening and Posttest section after listening.

1. Multiple studies comparing the J pouch to straight proctectomy suggest that the superior outcomes associated with the J pouch persist over time.
   (A) True (B) False **

2. Contraindications to J pouch creation include:
   1. Narrow pelvis
   2. Pregnancy
   3. Bulky sphincter
   4. Diverticulosis
   (A) 1,2,3,4 (B) 1,2,3 (C) 1,3 (D) 2,4

3. Of the reconstructive procedures available for patients who have undergone proctectomy, the best functional outcomes and quality of life are associated with:
   (A) Coloplasty (B) End-to-side anastomosis (C) Pseudo-continent colostomy (D) J pouch

4. A score ______ on the International Index of Erectile Dysfunction is considered indicative of erectile dysfunction.
   (A) <21 (B) <35 (C) <11 (D) >21

5. The best evidence currently available suggests that the incidence of new erectile dysfunction after total mesorectal excision (TME) is:
   (A) 57% (B) 67% (C) 77% (D) 87%

6. A study at the Cleveland Clinic showed that sexual dysfunction after TME in women is most often associated with:
   1. Abdominoperineal resection
   2. Radiation therapy
   3. Intraoperative sepsis
   4. Age <60 yr
   (A) 1,2,3,4 (B) 1,2,3 (C) 1,3 (D) 2,4

7. Which of the following is the best option for a morbidly obese patient who requires surgery for ulcerative colitis?
   (A) Total colectomy with ileorectal anastomosis (IRA) (B) Restorative proctocolectomy (C) Total proctocolectomy with end ileostomy (D) Continent ileostomy

8. Choose the correct statement about total colectomy with IRA.
   (A) More complex procedure than restorative proctocolectomy (B) Not recommended for younger patients with concerns about fertility (C) Compared with pouch, associated with higher risk for morbidity (D) May remain intact for ≤20 yr

9. Which of the following complications is considered the “Achilles’ heel” of continent ileostomy?
   (A) Slippage of the nipple valve (B) Wound complications (C) Bowel obstruction (D) Excessive bleeding

10. Practicing on a robotic simulator before performing robotic surgery has been demonstrated to significantly improve patient outcomes.
    (A) True (B) False **

Answers to Audio-Digest General Surgery Volume 59, Issue 18: 1-C, 2-A, 3-C, 4-D, 5-D, 6-C, 7-B, 8-B, 9-C, 10-B