

## COLONIC J-POUCH-ANAL-ANASTOMOSIS (CPAA) OR COLONIC ANASTOMOSIS WITH J-POUCH IN RECTOSIGMOID AND RECTAL CANCER

- History
  - APR (Miles) gold standard in first half of century in tx of rectosigmoid and rectal cancers
  - Dixon (Mayo Clinic, 1930) devised LAR for treatment of favorable tumors of mid-rectum and became procedure of choice
  - Until 1970s thought that 5cm distal margin from the tumor-- Williams et al. (1983) described distal spread of >2cm in less than 2.5% of excised tumors
  - Studies confirmed 2cm distal margin did not compromise survival – overall results similar LAR vs. APR
  - Endoanal stapler – increased technical ability to perform LAR

### Historical Concerns about LAR

- Complete incontinence– Lane and Parks (1977) examined patients undergoing complete rectal excision
  - Rectum not essential for appreciating impending evacuation/ sphincter inhibitory reflex
  - 7/9 patients had both internal and external sphincter inhibition
  - 8/9 normal feeling of perianal fullness
  - Theory- regeneration of intramural network of nerves across anastomosis
- Local recurrence- McAnena et al. (1990)– local recurrence as low as 3.5% for cancers less than 7cm from anal verge with 14mm distal clearance
  - preservation of sphincter apparatus is feasible without compromising oncologic result.
- Techniques for first developed
  - Coloanal / straight anastomosis- Parks (1972)- rectal excision, endorectal mucosectomy, coloanal anastomosis
    - Anterior resection syndrome- defecatory frequency /urgency, soiling common sequelae
  - J-pouch - Lazorthes et al. (1986)- rectal excision, pouch formation, anastomosis- 20 pts after 1 year post- surgery had a median 2.3 BMs/day, 60% had <2/day, normal continence 60%
  - Parc et al. (1986) – 30 patients BM after 3months 1.1/day mean, absent urgency, minor incontinence in 33% resolved after 3 months. Normal sensation for evacuation 75% of patients, but difficult evacuation was seen in 25%.
  - Colonic J-pouch vs. Straight Anastomosis
    - Kusonoki et al. (1991)- Straight anastomosis group high number of sequelae compared with CPAA, abandoned study early
    - Ortiz et al. (1995)- 38 patients- after 12 month follow-up: 33.3% BM > 3/day for CPAA vs. 73.3% for SA

- Seow-Choen et al. (1995)- 33 patients randomly assigned, after one year follow-up had mean 6 BM/day in SA vs. 3 BM/day CPAA, but CPAA group had greater sensation of incomplete defecation
- Generally agreed that CPAA may optimize anal function in early post-op course
- Other advantages
  - Possible decreased anastomotic leak incidence-Hallbook et al. (1996) 1/45 CPAA vs. 8/52 SA with anastomotic leaks
    - Theories
      - Hallbook et al. (1996) Better vascularization of apex of colonic pouch vs. terminal colon confirmed by doppler
      - Removal of any rectum with compromised vascularity
      - Bulky pouch decreases dead space in pelvis where blood clots can accumulate
- Long-term functional outcomes CPAA vs. SA
  - Hallbook et al (1998)- 100 patients randomly assigned to CPAA vs. SA-- significant decrease in frequency, nocturnal movements, degree of urgency, incontinence score in CPAA at 2 & 12 months. CPAA gives better clinical bowel function- especially in first two months and possibly up to a year
  - Lazorthes et al (1997)- 40 patients- constant reduction in frequency for 3, 12, 24 months- benefit at least 2 years
  - Ho et al (2001)- 42 patients randomized clinical trial: at 6 months CPAA significantly less frequency of stool but at 2 years no significant difference with SA in frequency, soiling or passing flatus.
- Other issues with CPAA
  - Defecation difficulty noted in several of the prior studies– Sugamata et al. (2003) after studying 19 CPAA and 22 SA with 99mTc tagged artificial stool found t1/2 and Evac1 significantly longer in pouch vs. straight group. Suggests that less effective emptying in patients may be a factor in causing evacuation difficulty in J pouch.
  - Inability to construct J pouch – Harris et al. (2002)- narrow pelvis, bulky anal sphincters, need for mucosectomy, diverticulosis, insufficiency. length of colon, pregnancy, complex surgery, metastatic disease are risk factors for failure of ability to perform surgery
- Other studies of interest
  - Hida et al. (1996)- 5cm vs. 10 cm pouch size found 12 mo. physiologic function similar. Evacuation better in 5cm but decreased reservoir size. Concluded, however, that reservoir size is adequate with better evacuation.
    - Ho et al. (2002)- small colonic J pouch (6cm) improves liquid retention randomized clinical trial -11 pts.

- Dehni et al. (1998) report that CPAA in elderly >75 have favorable functional outcome compared to younger patients
  - Heah, Seow-Choen et al. (2002)- 46 patients, randomized clinical trial, median 12 month follow-up no significant difference in stool frequency, incontinence, urgency, use of pads and antidiarrheals, sensation of incomplete evacuation, anorectal physiology in J pouches made from sigmoid or descending colon. (sigmoid has been implicated in cause of defecation difficulty)
  - Machado et al. (2002)- 161 patients: routine use of diversion in LAR with colonic pouch shows no significant difference in anastomotic leak or pelvic sepsis and requires a second admission for closure
  - Furst et al. (2002)- 74 patients randomized clinical trial - showed a decrease to a similar degree in neorectal capacity in short J-pouch and SA group but superior continence for gas and liquids in J-pouch vs. straight anastomosis. Theorize- J pouch advantage is not increased neorectal capacity as originally thought but decreased motility.
- Newer colonic reservoirs
    - Von flue et al. (1996) Ileocecal reservoir- ileocecal segment is rotated 180 degrees counterclockwise and interposed between sigmoid and anus- proponents say improved preservation of extrinsic and intrinsic innervation.
    - Coloplasty- described in animal model by Z'graggen et al. (1999) derived from Hienicke- Mikulicz pyloroplasty- longitudinal antimesenteric colotomy 8-10cm long starting 4-6cm proximal to distal cut end of colon closed transversely, end-to-end low colorectal anastomosis. Simple, may prove to be useful in obese patients where J pouch diff. because of fatty mesentery.
  - J pouch vs. Coloplasty (CP)
    - Mantyh et al. (2001)- 20 patients showed similar functional outcome
    - Ho et al. (2002)- 88 patients randomized clinical trial showed no difference in intra-op time or hospital stay. CP had more anastomotic leaks. 4 months J pouch had 10.3% less stool fragmentation but poorer stool deferment and nocturnal leakage. No difference in bowel function, continence score, quality of life in one year, manometry or ultrasound- conclude J pouch is still bench mark because CP had more anastomotic leaks- due care should be exercised with CP

## Summary

- J pouch currently provides good short-term results vs. straight anastomosis.
- Long term differences are questionable.
- Role of coloplasty is still unclear.
- Hopefully, with continue collaboration between clinical and basic science research outcomes and quality of life measures for rectal cancers survivors will continue to be improved.

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