PERINEAL WOUND CLOSURE AFTER ABDOMINOPERINEAL RESECTION
49 year old male who was found to have a rectal mass upon workup for anemia and bloody stool in August 2010

Presented with intermittent episodes of blood streaked stool for 2 years

Found to have Hb/Hct of 6.2/24.8

No nausea, vomiting, abdominal pain, or significant weight loss
PMH: none
Allergy: NKDA
Medications: none
Family Hx: Father – pharyngeal cancer
Social Hx: Alcohol abuse for over 30 years, in rehab
PHYSICAL EXAM

- Gen: AAOx3, NAD
- HEENT: no icterus, no pallor, moist mucosa
- CVS: S1S2 normal, RRR
- Chest: CTA b/l
- Abd: soft, nontender, nondistended, normal BS, no masses palpable
- Rectal: hard firm mass, blood
- No palpable lymphadenopathy
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IMAGING

Initial CT with long segment and circumferential thickening of rectum
Colonoscopy revealed a 14cm long lesion extending from near the anal canal to sigmoid colon.

Pathology:
- Transverse polyp – TVA
- Sigmoid polyp – TVA with foci of adenocarcinoma
- Rectal mass - adenocarcinoma
The patient underwent neoadjuvant chemoradiation (49Gy)

November 2010 - Rectal exam under anesthesia with rigid proctoscopy after treatment revealed minimal response to neoadjuvant treatment

Mass was 1-1.5cm from the dentate line, friable, hard, and circumferential

The pt chose to delay surgery to go on vacation and underwent resection in February 2011
Repeat CT after neoadjuvant therapy
Bilateral ureteral stents placed by Urology
Laparoscopic assisted APR with permanent colostomy
Left colon, sigmoid and rectum were mobilized laparoscopically for the TME
We noted a structure on the left side of the pelvis which possibly represented ureter
Abdomen was opened, ureter was identified and followed down
The TME was completed in an open fashion from above and below
Abdominal wound was closed and permanent colostomy was fashioned
The peritoneum was closed near the pelvic inlet with a running suture.

A 20 fr foley catheter and 1 inch penrose drain were placed in the perineal wound.

The wound was closed in layers:
- Deep levator muscle and subcutaneous tissue
- 2 layers of subcutaneous tissue
- Skin closed with 0 nylon mattress sutures
POSTOP COURSE

- **POD 2:**
  - Colostomy producing gas
  - NG tube removed, started clears
  - Ureteral stents removed

- **POD 3:**
  - Colostomy producing stool

- **POD 4:**
  - Diet advanced
  - Edges of perineal wound ischemic
  - Perineal wound debrided
POD 5: Bottom of midline abdominal wound opened for wound infection

POD 6: B/L upper lobe pneumonia
    + Appropriate antibiotics given

POD 11: Tolerating regular diet
POD 12:
- Perineal wound debrided further
- Foley and penrose removed

POD 13:
- VAC dressing placed

POD 21:
- OR debridement of wound
POSTOP COURSE

- POD 25:
  - Abdominal wound closed by delayed primary
  - Discharged home

- POD 34:
  - Seen in clinic
  - Abdominal wound healed
  - Perineal wound clean and granulating
PATHOLOGY

- T3N1Mx
  - Invasive mucinous adenocarcinoma
  - Proximal, distal, and radial margins free of tumor
  - 3/19 lymph nodes positive
  - No lymphovascular invasion

- Stage IIIB
PERINEAL WOUND CLOSURE AFTER ABDOMINOPERINEAL RESECTION
INTRODUCTION

- Rectal cancer is a significant source of morbidity and mortality in the US
- >40,000 cases diagnosed each year
- Cure is rarely achieved without R0 resection
- Mainstay of treatment is surgical excision with TME and chemoradiation
- However, morbidity from perineal wound complications occurs in up to 30-40%

COMPLICATIONS OF RECTAL SURGERY

- Wound infection 7%
- Anastomotic leak 11%
- Pelvic sepsis 12%
- Postop death 2%
- Fecal incontinence
- Perineal wound infection
- Perineal wound breakdown
- Perineal Fistula

Most common operations are LAR and APR.

Neoadjuvant chemoradiation has improved local control and sphincter preservation in low rectal tumors.
EFFECTS OF RADIATION

- Capillary obliteration and fibrosis result in impaired tissue oxygenation, altered cellular immune mechanisms and decreased fibroblast activity
- Long-lasting effects
- Salvage APR for anal cancer
  - 25-70% wound complications
  - Wound healing time >3 months in 66%
- Radiation increases rate of wound complications 2-10 times
- Perineal wound complications after APR for rectal cancer are 35-41% with radiation

OPTIONS FOR PERINEAL CLOSURE

- Open drainage
- Suture of perineal wound and pelvic peritoneum
- Suture of perineal wound without suture of pelvic peritoneum
- Use of mesh sling to close peritoneum
- Placement of various drains
  - Open drains
  - Closed suction drains
  - Vacuum devices
- Antibiotic impregnated products
- Omentoplasty
- Myocutaneous flap reconstruction
WHAT SHOULD WE DO?

- There have been no good, randomized, controlled trials comparing the various methods of perineal closure available today.
- There are many case series that support the effectiveness of various techniques.
- Practice guidelines for any particular closure method cannot be given with the current studies available.
In traditional surgery, primary healing was considered impossible.

In the 1970’s, several studies compared open drainage vs. primary closure of the perineum:
- Incidence of primary wound healing was higher with primary closure (45-49%).
- Incidence of persistent sinuses and unhealed wounds was lower.
- Wounds that were closed primarily and then reopened secondary to infection had similar results to wounds that were left open primarily.

186 patients randomized to receive passive (n=96) or closed suction (n=90) drainage
Followed for 12 months
Rate of healing at 1 month was significantly lower in the passive drainage group, 61% vs. 75% (p<0.05)
At 3 months the rate was similar, 81 vs. 84%
At 12 months the rate of fistula, secondary reopening and nonhealing was similar as well
Results suggest closed suction drainage should be used after APR
Others comparing open packing vs. simple drain vs. closed suction drain vs. closed suction drain + irrigation system found similar results

CLOSE THE PERITONEUM?

- Leaving peritoneum open allows small bowel to descend into pelvis
- Creates difficulty if pt develops SBO or recurrence of tumor
- Risk of evisceration if perineal wound opens
- Radiation can affect small bowel
- Closing the peritoneum creates an empty space in the pelvis
  + May lead to higher rate of infection

LOCAL ANTIBIOTICS IN THE PERINEAL WOUND

- Antibiotic concentrations in the sacral wound given IV or PO are negligible
- Local application achieves high concentrations
- Use of gentamicin impregnated collagen fleeces to improve wound healing
- 97 patients randomized to 2 groups
  + All had primary closure in layers with a drain
  + Randomized to either with or without gentamicin impregnated collagen fleece

Most common organisms were staph, enterococcus, pseudomonas

83-100% sensitive to gentamicin

Lower rate of perineal infection in Genta group, 6 vs. 21% (p<0.05)

Primary perineal wound healing 88 and 75% (p=0.124)

OMENTOPLASTY

- Greater omentum can be used to fill the dead space in the pelvis after APR
- Brings well vascularized, non-irradiated tissue
- No randomized trials are available
- Recent review of the literature found 4 cohort studies and 6 case series
  - Total 366 patients
  - Only 2 of the cohort studies had adequate controls
- Cohort studies found statistically significant improvement in healing rates and complication rates
- No adequate evidence for or against omentoplasty

MYOCUTANEOUS FLAP RECONSTRUCTION

- Advantages:
  - Brings well-vascularized, non-irradiated tissue
  - Can also allow for functional reconstruction

- Disadvantages:
  - Increased operative time
  - Increased cost
  - Donor site complications
  - Flap complications

- Main options:
  - Rectus abdominus flap
  - Gracilis flap
  - Gluteus maximus flap

Small cohort study of 19 patients who underwent rectus flap reconstruction after APR for anorectal cancer

Compared to control group of 59 patients with primary closure

Perineal wound complications were seen in 15.8% and 44.1% (p=0.03)

Incidence of other complications was similar (42.1% vs 42.4%, p=0.8)

Flap group was generally higher risk (more vaginectomy, intraop radiotherapy, recurrent disease)

MYOCUTANEOUS FLAP RECONSTRUCTION

- Gracilis and Gluteal Flaps:
  + No controlled clinical trials
  + Only retrospective case series and comparative studies are available
  + Most report decreased incidence of perineal wound complications

- No definitive evidence can be given to support making practice guidelines
- Decision to use a flap is usually based on the goals of reconstruction

SUMMARY

- APR is associated with high rate of morbidity secondary to perineal wound complications
- Primary closure should be performed
- There is evidence to support use of closed suction drains
- No definitive evidence to support local antibiotics, omentoplasty, or flap reconstruction
REFERENCES