

*Management of high output stomas
(HOS)*

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Case History

- Mr C 50 year old male diagnosed with rectal cancer .
- He presented to GP with 5 month history of altered bowel habit, pr bleeding and tenesmus. No family history of note.
- Referred to Colo rectal clinic.
- Colonoscopy rectal lesion 6 cms histology adenocarcinoma
- CT demonstrates isolated liver lesion
- ERUS T3 lesion
- MRI T3
- Pet scan as above T3
- Discussed at MDT tumour conference.
- Liver opinion and plan liver resection in future.

Plan of care

- Seen by oncologist and radiotherapist.
- Neo adjuvant chemo/ radiotherapy.
- Low anterior resection and TME
- Covering loop ileostomy.
- Histology T3N0
- Adjuvant chemo therapy folfox had 3 doses.
- No problems initially, little diarrhoea. Grade 1
- Diarrhoea increased with HOS Grade 4
- Admitted with HOS

High output stomas

- Small bowel stomas are commonly formed.
- Elective or emergency procedure.
- Defunction the bowel.
- Newly formed stoma will work within 24 hours, up to 1200ml of watery stool.
- Consistency usually changes over time, dependent on patients anatomy and their underlying disease. (Carlson, 2001).
- Dependent on volume of food and fluid consumed, and gastrointestinal secretions.

Problems with a high output stoma (HOS).

- Problems will normally occur when there is less than 200cm of small bowel remaining (jejeunostomy).
- High output >2000ml/day.
- Frequent monitoring to avoid complications.
- Dehydration/ renal impairment.
- Electrolyte abnormalities such as sodium depletion, and hypomagnesaemia. Low K
- Undernutrition (Nightingale et al, 2006).

Definition of a HOS

- The length of small bowel remaining is a guide to determine which patients will require long term fluid/ electrolyte supplementation and nutrition support.
- Parenteral nutrition/saline is normally required if <100cm of small bowel remains.
- If small bowel length is 100-200cm, oral fluid/electrolyte management will be required.
- Quality of remaining bowel – if residual disease such as cancer or Crohns disease remain.
- Volume of daily output will determine who requires management to reduce fluid and electrolyte losses.
- Little evidence in the literature about post-operative HOS.
- Usually transient and settles within 2 weeks of stoma formation.

Causes of a high-output stoma

- Surgery that results <200cm residual small bowel and no colon.
- Intra-abdominal sepsis.
- Intestinal obstruction (at stoma site or proximal). Investigate with CT scan.
- Enteric infection (clostridium difficile)
- Recurrent disease in the remaining bowel.
- Radiation enteritis
- Medication (sudden withdrawal of steroids, prokinetics, laxatives).

Consequences of a high -output stoma

- Water and sodium depletion (thirst, postural hypotension, headaches, nausea).
- Urine output less than 800ml/day, renal impairment and urinary sodium less than 20mmol/litre. This indicates sodium depletion, kidneys trying to conserve sodium due to HOS.
- A urine sodium concentration can be low before serum sodium levels change. His urine spot sodium was 8mmol/litre.
- Hypomagnesaemia serum magnesium <0.7mmol/litre.
- Malnutrition (due to malabsorption or food avoidance to alleviate symptoms) with a low albumin.
- Frequent emptying of stoma bag/ leakage/skin care problems. Excoriation ++

Management

- Ileostomy outputs contain a large amount of sodium (approx 100mmol/litre sodium =6g salt).
- Daily volume is normal (600-1200ml) sodium and fluid requirements can be met by fluid and high salt replacement.
- High output stomas >2000 become thirsty, natural response is to increase intake of normal fluids, which are low in salt.
- This compounds the problem as fluids with <90mmol/litre sodium result in a net loss of sodium from the body into the stoma (Newton et al, 1985)
- Important to restrict low sodium fluids (including sport hydration drinks which have not enough sodium) to 500-1000ml daily.
- Sodium/fluid losses must be replaced with a glucose-electrolyte solution, 1000-2000ml daily to aid sodium absorption from the intestine. Iv fluids 0.9% saline as well as nil by mouth for 24-48 hrs. Difficult to achieve. Patients ill advised to increase fluid intake.
- Compliance can be an issue. Palatability can be improved by adding sugar free squash. Do not over dilute. Solutions can be chilled.
- Iv therapy either s/c or cannula. Care of s/c site.

Medication

- High doses of anti-diarrhoeal medication, eg loperamide 4mgs qds and 8mgs qds if no response.
- Take 30 mins before meals and at bed time.
- Capsules opened if they emerge in the bag.
- Anti-secretory drugs eg proton pump inhibitors (omeprazole) 40mgs daily or BD to reduce gastric secretions.
- Routine use of octreotide is not used for HOS.
- Hypomagnesaemia (<0.7 mmol/litre) with muscle cramps, tetany, disorientation, cardiac arrhythmias.
- Monitor strict fluid balance, daily weights, serum biochemistry, including magnesium levels.
- Add in Codeine phosphate 15-60mgs qds before meals.

Management of HOS

- British Society of Gastroenterology (BSG) guidelines advise the following
- Initial rehydration with IV saline
- Hypotonic oral fluid restriction (500-1000ml/day)
- St Marks Solution
- Anti diarrhoeals
- Esomepazole 40 mgs daily

Cancer treatment induced diarrhoea/ high output.

- Diarrhoea/ HOS well recognised side effect of fluoracil (5FU) and Irinotecan. Purine test
- Radiotherapy both abdominal and pelvic.
- Loss of fluids and electrolytes=dehydration
- Renal insufficiency, sepsis, cardiovascular morbidity.
- Quality of life.
- Dietary modifications.
- Dose reduction.

Management of chemotherapy - induced diarrhoea / HOS

Medication

- Opioid loperamide 4mgs initial dose, followed by 2 mgs every 4 hours.
- More aggressive therapy for grade 3-4 diarrhoea, synthetic somatostatin analog, octreotide at a standard dose of 100-150ug three times daily (TID) via subcutaneous (SC) is recommended. He was on max dose 600ug.
- Antibiotics with Flagyl one of choice.

- EVALUATE**
- Obtain history of onset and duration of diarrhea
 - Describe number of stools and stool composition (eg, watery, blood in stool, nocturnal)
 - Assess patient for fever, dizziness, abdominal pain/cramping, or weakness (ie, rule out risk for sepsis, bowel obstruction, dehydration)
 - Medications profile (ie, to identify diarrheogenic agents)
 - Dietary profile (ie, to identify diarrhea-enhancing foods)

UNCOMPLICATED
CTC grade 1-2 diarrhea
with no complicating
signs or symptoms

ADDED RISK FACTORS

- COMPLICATED**
CTC grade 3 or 4 diarrhea
or grade 1 or 2 with one or
more of the following signs
or symptoms
- Cramping
 - Nausea/vomiting (\geq grade 2)
 - Decreased performance status
 - Fever
 - Sepsis
 - Neutropenia
 - Frank bleeding
 - Dehydration

- MANAGEMENT**
- Stop all lactose-containing products, alcohol, and high-osmolar supplements
 - Drink 8 - 10 large glasses of clear liquids a day (eg, Gatorade or broth)
 - Eat frequent small meals (eg, bananas, rice, applesauce, toast, plain pasta)
 - Instruct patient to record the number of stools and report symptoms of life-threatening sequelae (eg, fever or dizziness upon standing)
 - For grade 2 diarrhea, hold cytotoxic chemotherapy until symptoms resolve and consider dose reduction

- TREATMENT**
- Administer standard dose of loperamide: initial dose 4 mg followed by 2 mg every 4 hours or after every unformed stool
 - Consider clinical trial

Reassess 12 - 24 hours later

Diarrhea unresolved

Progression to severe diarrhea
(NCI grades 3 - 4 with or without
fever, dehydration, neutropenia,
and/or blood in stool)

- Diarrhea resolving**
- Continue instructions for dietary modification
 - Gradually add solid foods to diet
 - Discontinue loperamide after 12-hour diarrhea-free interval
- RT-induced: Continue loperamide

- Persistent diarrhea (NCI grades 1 - 2)**
- Administer loperamide 2 mg every 2 hours
 - Start oral antibiotics
 - Observe patient for response
- RT-induced: Oral antibiotics not generally recommended

Reassess 12 - 24 hours later

- Diarrhea resolved**
- Continue instructions for dietary modification
 - Gradually add solid foods to diet
 - Discontinue loperamide after 12-hour diarrhea-free interval
- RT-induced: Continue loperamide

Diarrhea unresolved

Progression to severe diarrhea
(NCI grades 3 - 4 with or without
fever, dehydration, neutropenia,
and/or blood in stool)

Persistent diarrhea (NCI grades 1 - 2)
(no fever, dehydration, neutropenia,
and/or blood in stool)

- EVALUATE IN OFFICE/OUTPATIENT CENTER**
- Check stool workup (blood, fecal leukocytes, *Clostridium difficile*, *Salmonella*, *Escherichia coli*, *Campylobacter*, infectious colitis)
 - Check CBC and electrolytes
 - Perform abdominal exam
 - Replace fluids and electrolytes as appropriate
 - Discontinue loperamide and begin second-line agent
 - Octreotide (100 to 150 μ g SC TID with dose escalation up to 500 μ g TID)
 - Other second-line agent (eg, tincture of opium)
- RT-induced: Continue loperamide or other oral agent; no workup required

- ADMIT TO HOSPITAL***
- Administer octreotide (100 to 150 μ g SC TID or IV [25-50 μ g/hr] if dehydration is severe with dose escalation up to 500 μ g TID)
 - Start intravenous fluids and antibiotics as needed (eg, fluoroquinolone)
 - Stool work-up, CBC, and electrolyte profile
 - Discontinue cytotoxic chemotherapy until all symptoms resolve; restart chemotherapy at reduced dose

Nutrition

- Dietary input.
- Enteral or parenteral
- Challenges for all the team members.
- Re assurance to patient and family.
- Long hospital stay.
- Delay in treatment.
- Dose reduction.

Conclusion

- HOS is common. It is transient.
- Maybe due to postoperative overload with iv saline that reduces gastric motility
- In 50 % of patients an underlying cause will be apparent.
- Cancer induced HOS needs more aggressive management.

Thank you