

Chronic Diarrhea

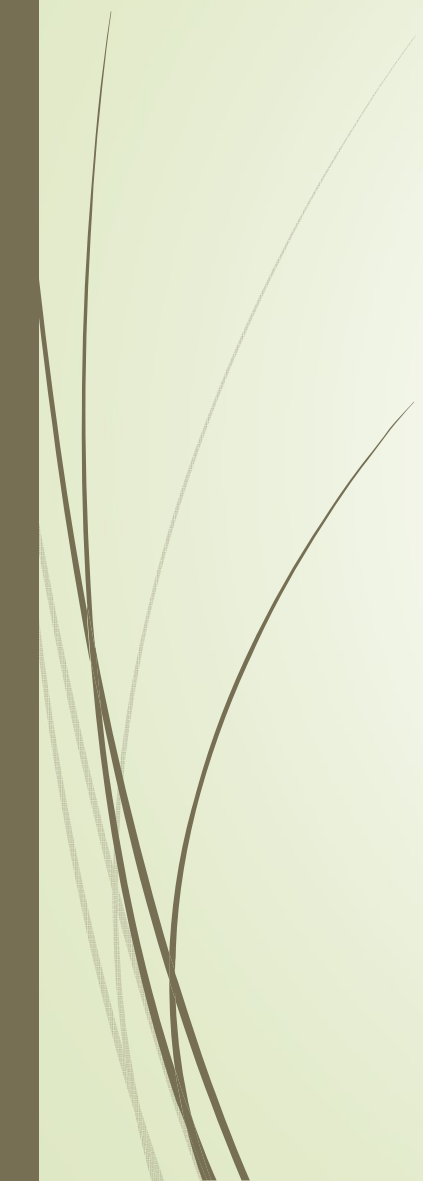
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Chronic diarrhea

- **Definition**
 - **Causes**
 - **Classification**
 - **History and physical examination.**
 - **Clinical clues**
 - **Investigation Paradigm**
- 



Definition

- Symptomatic definition: Increased frequency, fluidity or volume, or a combination of these
- Physiologic definition: decreased absorption or increased secretion, or usually both, causing > 200 mL liquid excretion per day

Input

Diet/Saliva : 3 L/d

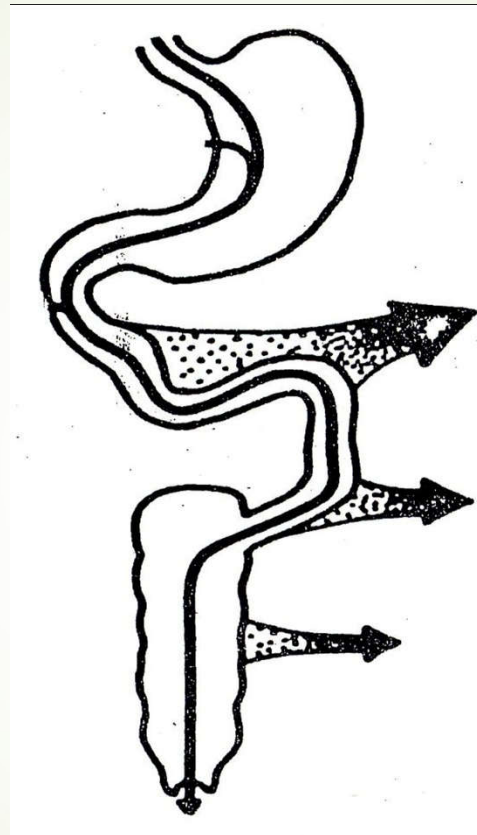
Stomach : 2 L

Bile : 1 L

Pancreas : 2 L

Bowel : 1 L

Total 9 L



Absorption

Jejunum : 5 L/d

Ileum : 2-3 L

Colon : 1-2 L

Total 8.8 L

Fecal Water 100-200 mL/d

Thus, diarrhea is defined as >200 mL liquid excretion per day. In extremes, the gastrointestinal tract can both absorb and secrete 20 L of water per day.

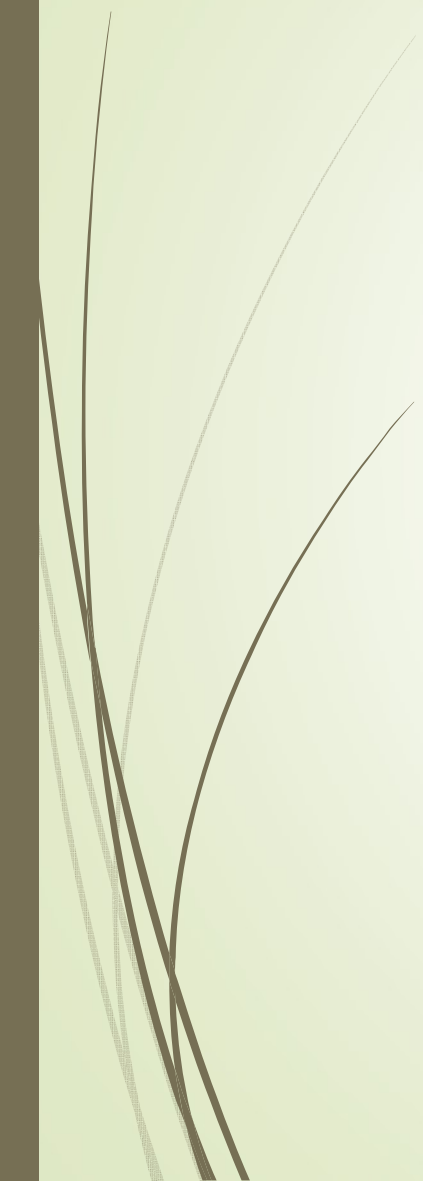


Chronic diarrhea

- **Abnormal Passage of loose or liquid stool more than 3 times daily and or volume of stool greater than 200gm \ day**
- **Decrease in fecal consistency lasting for 4 or more weeks.**
- **It affect 4- 5% of the general population.**
- **It may decrease quality of life significantly.**



Range of conditions causing Chronic Diarrhea

- **Colonic neoplasia and inflammation**
 - **Small bowel inflammation**
 - **Small bowel mal-absorption**
 - **Mal-digestion**
 - **Motility disorders**
 - **Functional bowel disorders**
- 



DR. MUR



Causes

- ▶ **Osmotic** mg, Po₄, So₄ ingestion, carbohydrate mal-absorption.
- ▶ **Fatty**, Mal-absorption syndromes, Mucosal disease, SBS, post resection diarrhea, bacterial overgrowth, mesenteric ischemia. Mal-digestion, Pancreatic exocrine insufficiency, inadequate bile acids.



Causes

- ▶ **Inflammatory**, IBD, Diverticulitis, Ulcerative jejunoileitis. Infectious Pseudomembranous colitis, TB, Yersinosis, viral (CMV, Herpes Simplex), Amebiasis. Ischemic colitis, Radiation colitis, ca, lymphoma.
- ▶ **Secretory**, non osmotic laxatives, Post cholecystectomy, chloridorrhea, Bacterial toxins, Ileal bile acids malabsorption, IBD, Microscopic colitis, Diverticulitis, drugs and poisons,



Causes

- ▶ **Motility issues**, postvagotomy, post sympathectomy, autonomic neuropathy, hyperthyroidism, IBS, Neuroendocrine tumors Gastrinoma, VIPoma, Somatostatinoma, Mastocytosis, Carcinoid, Medullary thyroid ca.
- ▶ Colon ca, Lymphoma, Villous adenoma, Addison disease, Epidemic, Idiopathic.



History

- **Establish that symptoms are organic.**
- **Distinguish inflammatory \ mal absorption and colonic causes**
- **Assess specific causes of diarrhea.**
- **Presence of Red flags.**



History

- Stool volume, consistency, frequency, urgency, soiling, greasy, malodorous or presence of blood.
- Onset, Travel, HIV, Wt loss, incontinence
- Effect of fasting, night symptoms, family history of IBDs
- Fever, joint pain, mouth ulcers, red eyes.
- Alcohol, sorbitol, fructose, lactose, Drugs.
- Previous surgery, Pancreatic disease, systemic illness.
- Recurrent bacterial infections \ risk factors for HIV



Physical Examination

- Mouth Ulcers, Skin rash, episcleritis, anal fissure and fistula.
- Presence of blood on PR, abdominal masses.
- Wasting, anemia, abdominal scars.
- Lymphadenopathy, Palpable thyroid and other signs of thyroid disease.
- Decrease anal sphincter tone.



Investigation

- **Basic investigation.**
- **Specific investigation may be guided by the history and Physical examination.**
- **Try to classify the nature of diarrhoea.**



Basic Investigation

- **CBE, ESR, CRP**
- **Ferritin**
- **KFT, Electrolytes, BS, Ca**
- **Celiac serology**
- **Thyroid function test**
- **Stool examination**



Classification

- **Inflammatory**
 - **Fatty**
 - **Watery**
 - **Secretory**
 - **Osmotic**
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Osmotic vs Secretory

- ▶ **Osmotic** - Diarrhea ceases with fasting
- Secretory** - Diarrhea continues with fasting

- ▶ **Mechanism** - Luminal contents are in osmotic equilibrium at 290 mOsm/kg with other body fluids.



Inflammatory vs Non-inflammatory

- **Inflammatory** - Frequent, blood, pus, fever, abdominal pain, tenesmus, fecal leukocytes
- **Non-inflammatory** - Watery stool, without blood/pus/fever/fecal leukocytes



Fecal WBCs

***C. difficile* colitis**
Crohn's, Ulcerative colitis
Shigellosis
Salmonellosis
Typhoid fever (*S. typhi*)
Invasive *E. coli*
Y. enterocolitica
V. parahemolyticus

No Fecal WBCs

Giardiasis
Amebiasis
Viral enteritis
Toxigenic *E. coli*
Salmonella carrier
V. parahemolyticus
Microscopic colitis
Drug-induced diarrhea

Large Intestine vs Small Intestine

- **Large intestine** - Frequent urges, mushy/ dark colored/rarely foul, left lower quadrant pain, tenesmus, small volume
- **Small intestine** - Watery/light colored/foul, periumbilical/RLQ pain, large volume

Small Volume (< 400 ml)

Rectal and sigmoid disease - UC, ulcerative proctitis

Large Volume (> 400 ml)

Osmotic - Lactase deficiency, laxatives, sprue

Secretory - Cholera, ETEC, laxatives, BA malabsorp.*

Dysmotility - Post-gastrectomy syndrome, carcinoid, laxatives

Altered permeability - Sprue

*Ileal resection, Crohn's dis., J-I bypass, radiation



Drug-Induced Diarrhea

- ▶ **Any drug** - Temporal relation to the diarrhea
- ▶ **Especially antibiotics & Metformin (dose dependant)**

Other Clinical Clues

- **Nocturnal diarrhea** - Organic, not irritable bowel syn.
- **Previous surgery** -
 - Small intestinal disruption - Bacterial overgrowth
 - Removal >100 cm terminal ileum - Choloretic diarrhea
 - Cholecystectomy - Choloretic diarrhea
 - Gastrectomy - Dumping syndrome
- **Debilitated patient** - *C. albicans* .
- **Day care** - *Giardia, Cryptosporidium, Shigella*



Small Intestinal Disruption Induces Diarrhea by Several Mechanisms

- ▶ **Bacterial overgrowth → deconjugated bile salts → steatorrhea → osmotic diarrhea**
- ▶ **Reduced absorptive area**
- ▶ **Reduced transit time**

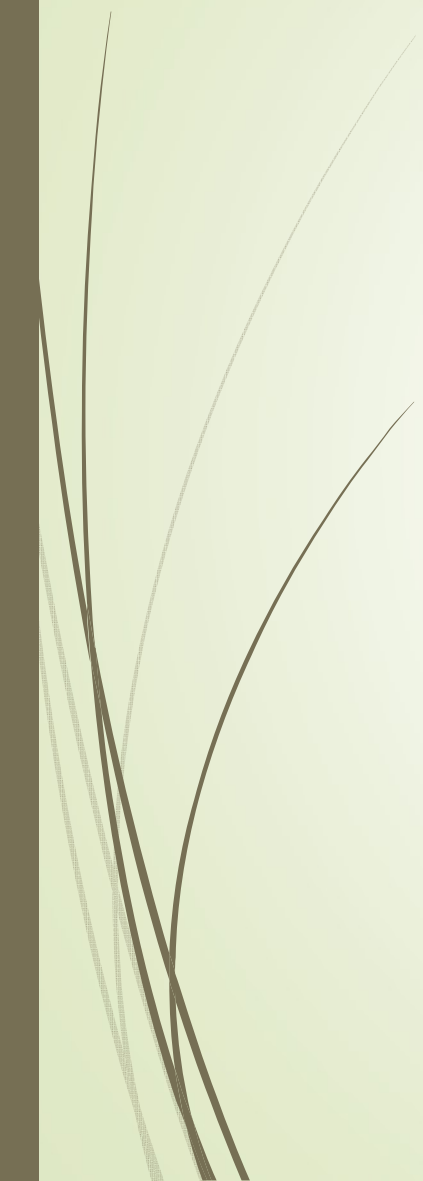


Secretory Diarrhea

- **Stool volum > 1l daily, watery in nature.**
- **Occurs day and night, continue during fasting.**
- **Osmotic gap less than 50mosm/kg.**
- **Stool Ph usually high.**
- **Signs of dehydration**
- **Acidosis**
- **No anemia or urgency.**



Secretory Diarrhea

- **Stool culture**
 - **Imaging of small and large intestine.**
 - **Gastrin, VIP levels.**
 - **Consider bile acid malabsorption.**
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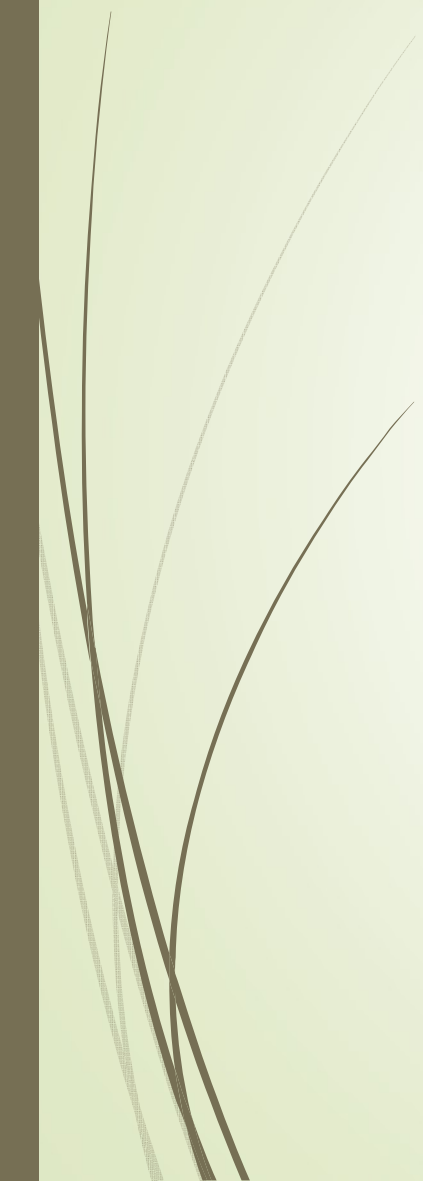


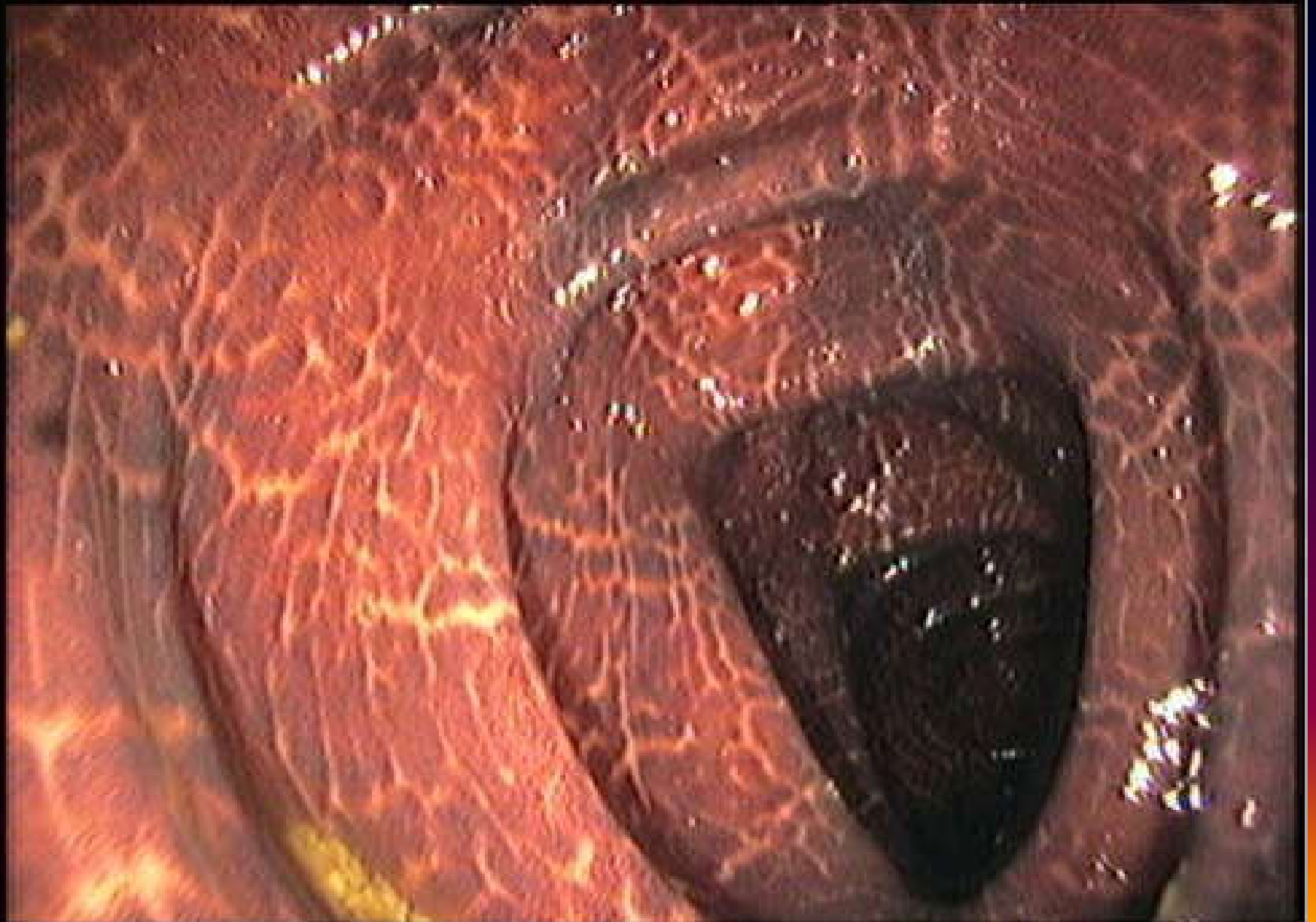
Osmotic Diarrhea

- Stool volume 500-1000 watery in nature
- Osmotic gap $> 125 \text{ mosm/kg}$
- Stool Ph is low.
- Stops on fasting and at night
- No urgency, dehydration or Anemia.
- Identification of an offending agent
sugarless candies, or Lactose
intolerance.
- Hydrogen breath test.



Osmotic Diarrhea

- **Testing for laxative abuse.**
 - **Melanosis coli on colonoscopy.**
 - **Test for bacterial overgrowth.**
 - **Specific evaluation for malabsorption syndromes**
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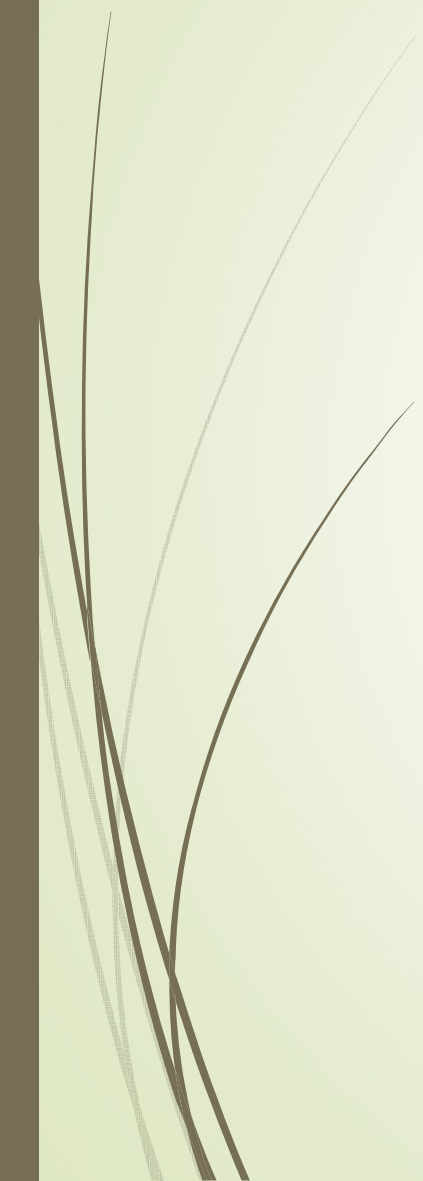


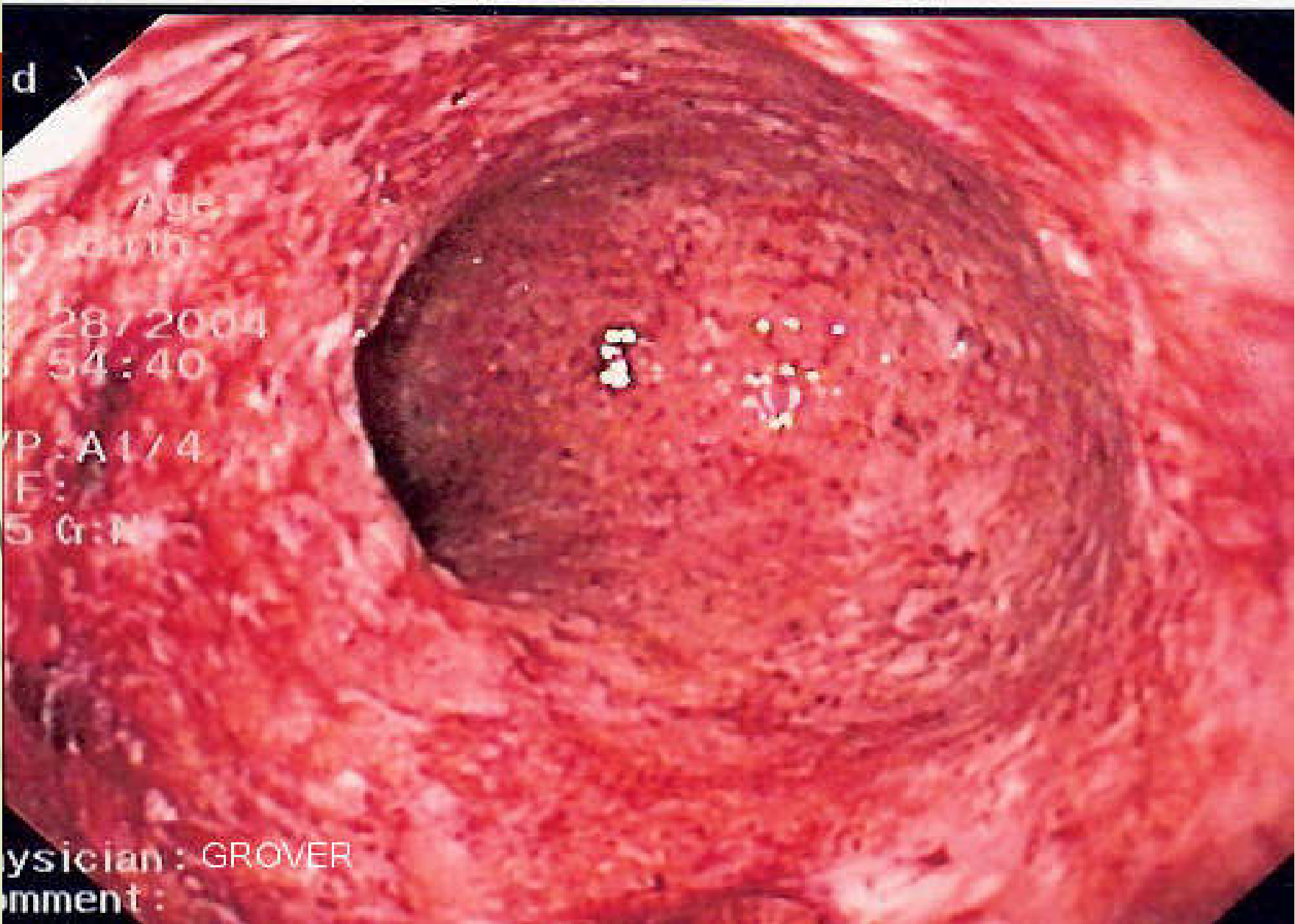
Inflammatory Diarrhea

- **Stool volume less than 500ml**
- **Osmotic gap usually normal.**
- **Stool Ph usually low.**
- **No effect on fasting.**
- **There may be Alkalosis.**
- **Stool usually bloody.**
- **There is urgency, dehydration and Anemia.**



Inflammatory Diarrhea

- **Consider IBD**
 - **Travel history, CI difficile infection, TB.**
 - **CRP, ESR.**
 - **Colonoscopy.**
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Age:

9 Month:

28/2004

54:40

IP: A1/4

E:

5 G: N

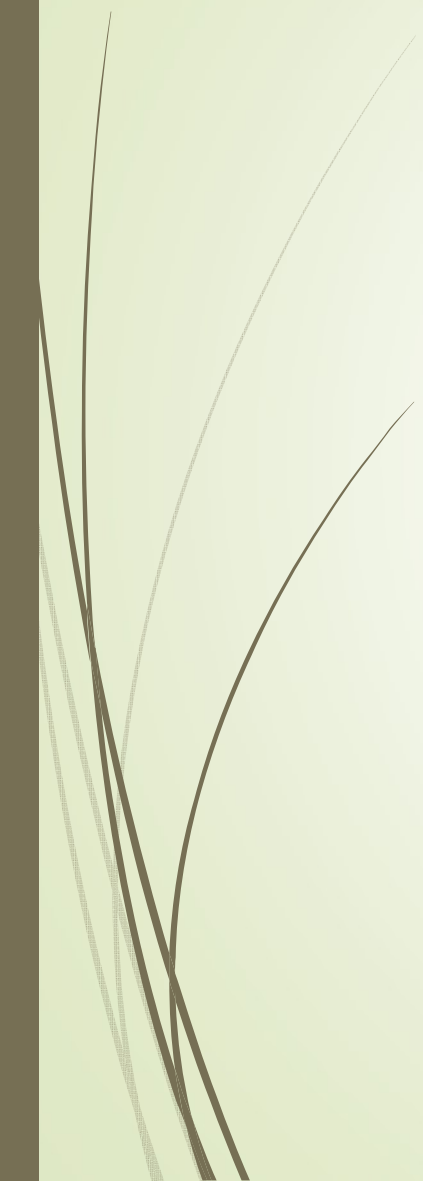
Physician: GROVER

Comment:





Fecal Leucocytes

- **Sensitivity and specificity were variable**
 - **Sensitivity 70%**
 - **Specificity 50%**
 - **It is not a good test to classify inflammatory diarrhea.**
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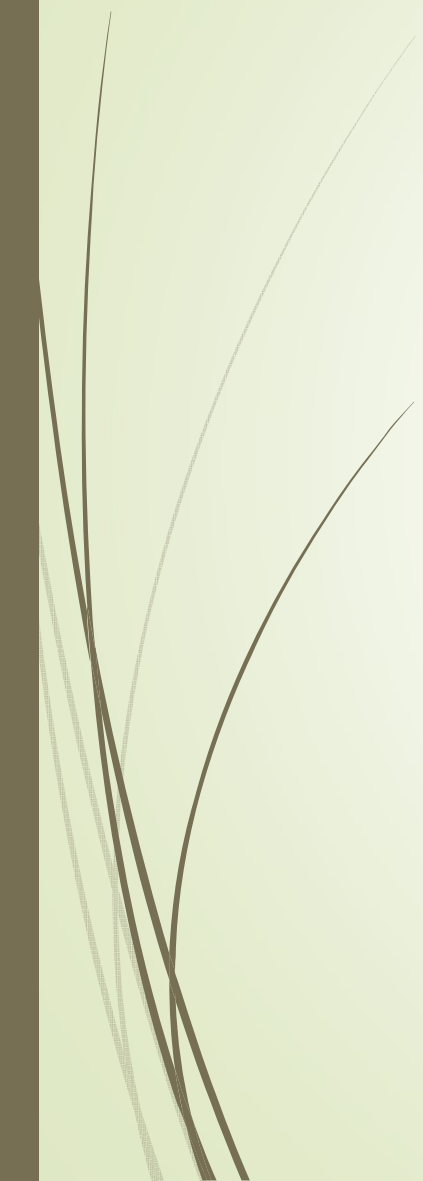


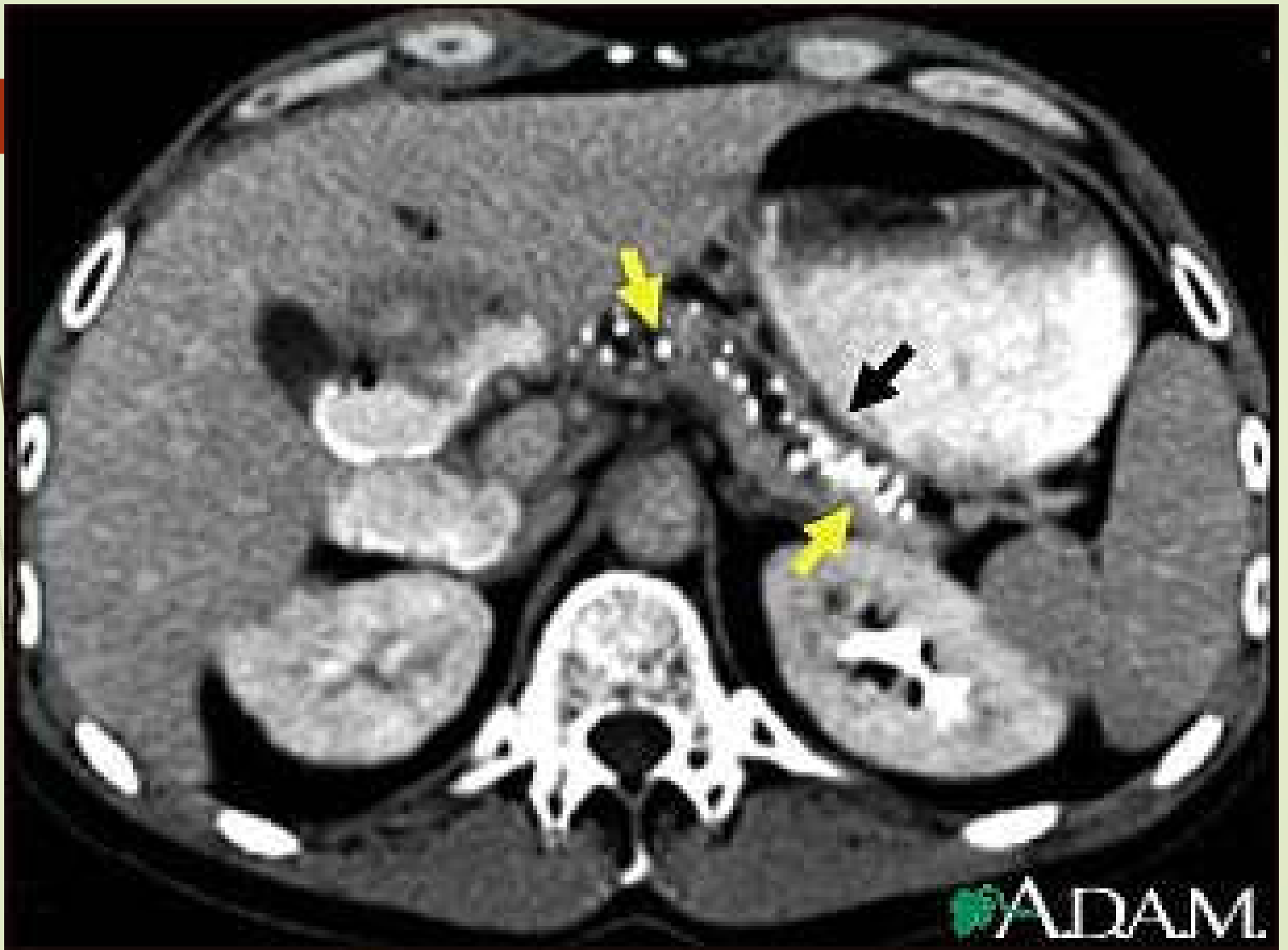
Fecal Calprotectin

- **It is a marker for neutrophils activity**
- **It is a binding protein for ca, and zink.**
- **Its level in stool is increased in the presence of intestinal inflammation.**
- **It is a good marker for colonic IBD monitoring.**



Fatty Diarrhea

- **Greasy malodorous stool.**
 - **Consider it in patients with chronic pancreatitis.**
 - **Quantification of fat in stool.**
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4620

SAR

4

No cut



/ Signa 1.5T
26.0 cm
mmthk/0.sp



Stool analysis

Weight

Osmotic gap

PH

Ocult blood

WBCs

Fat,
quantitative
sudan

Laxative
screen

Watery

Inflammatory

Fatty

Secretory

Osmotic

Secretory diarrhea

Exclude Infection

Bacterial, Aeromonas, Plesiomonas,

Ova, parasites, Coccidia, Microsporidia, Giardia

Structural disease

Small bowel Xray

Ct Abdomen

SBB Aspirate for Culture

Colonoscopy \ Sigmoidoscopy with biopsy

Selective testing

Gastrin, Calcitonin, VIP, Somatostatin

Urine for 5-HIAA, Histamin

TSH, ACTH stimulation, Immunoglobulins

Cholestyramine trial for bile acid diarrhea

Osmotic diarrhea

Stool Analysis

Low Ph,
Carbohydrate
mal absorption

Mg level, Laxatives

Breath test, lactase
assay,
Diet review

Inflammatory diarrhea

Structural
disease

Small bowel
Xray

Ct Abdomen

SBB

Colonoscopy\Sigmoidoscopy with biopsy

Exclude
Infection

Aeromonas, Plesiomonas, TB

Parasites and
Viruses.



Fatty Diarrhea

Structural
disease

Small bowel
Xray

Ct Abdomen

SBB Aspirate for
Culture

Pancreatic
exocrine insuff

Secretin test

Bentiromide test

Stool
chemotrypsin
activity

THANK YOU

