In the name of god
Chife complain abdominal distention
Present illness:
The patient is 62 years old man who was relatively well up to 5 month ago when developed abdominal discomfort and distension.

He was local physician had visited with a bit improvement then he was referred to this center because of abdominal distention and abdominal pain and constipation.

- The patient complains of weight loss and anorexia no fever nausea/vomiting or diarrhea, and there is no history of jaundice and dysphagia.
PMH

NO DM
NO IHD
NO HTN

Appendectomy 20 years ago
Nothing
c/s -
o/a + (heroin addiction, nasal, for 10 years)
alcohol user -
No special point
BP=110/80
T=37
RR=12
PR=80
PH/EX

HEENT
- No paleness
- No icterus
- Jvp NL
- Thyroid NL
- No Lymphadenopathy
Chest

Bilateral clear
S1 S2 no s3 - no s4
No murmurs
Abdomen

- Distend
- No tenderness
- No rebound
- No organomegaly
- Normo active BS
- Percussion: tympan
- Scar of apandectomy
EXT

- Powerful peripheral pulses
- No distal edema
- No clubbing
- No cyanosis
<table>
<thead>
<tr>
<th></th>
<th>WBC</th>
<th>6400</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>HB</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>HCT</td>
<td>38</td>
</tr>
<tr>
<td>4</td>
<td>MCV</td>
<td>86</td>
</tr>
<tr>
<td>5</td>
<td>MCH</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>MCHC</td>
<td>31</td>
</tr>
<tr>
<td>7</td>
<td>PLT</td>
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## OTHER LAB TEST

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<tr>
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<th>BS</th>
<th>Value</th>
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<td>1</td>
<td>BS</td>
<td>106</td>
</tr>
<tr>
<td>2</td>
<td>UREA</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Cr</td>
<td>0.9</td>
</tr>
<tr>
<td>4</td>
<td>NA</td>
<td>141</td>
</tr>
<tr>
<td>5</td>
<td>K</td>
<td>3.8</td>
</tr>
<tr>
<td>6</td>
<td>Ca</td>
<td>5.2</td>
</tr>
<tr>
<td>7</td>
<td>P</td>
<td>6.1</td>
</tr>
<tr>
<td>8</td>
<td>PTT</td>
<td>30</td>
</tr>
<tr>
<td>9</td>
<td>PT</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>INR</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Alt</td>
<td>48</td>
</tr>
<tr>
<td>---</td>
<td>-------</td>
<td>----</td>
</tr>
<tr>
<td>2</td>
<td>Ast</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Alp</td>
<td>226</td>
</tr>
<tr>
<td>4</td>
<td>Bil total</td>
<td>0.6</td>
</tr>
<tr>
<td>5</td>
<td>Bil direct</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>---</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>1</td>
<td>Alb</td>
<td>3.6</td>
</tr>
<tr>
<td>2</td>
<td>Total protein</td>
<td>6.4</td>
</tr>
<tr>
<td>3</td>
<td>ESR</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>CRP</td>
<td>negative</td>
</tr>
<tr>
<td>Test</td>
<td>Result</td>
<td>Unit</td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>T.S.H</td>
<td>0.4</td>
<td>uIU/ml</td>
</tr>
<tr>
<td>Anti-TPO</td>
<td>2.6</td>
<td>IU/ml</td>
</tr>
<tr>
<td>Free T3</td>
<td>2.1</td>
<td>Pg/ml</td>
</tr>
<tr>
<td>Free T4</td>
<td>1</td>
<td>Ng/dl</td>
</tr>
</tbody>
</table>
Serologic Test

CEA=2.93 NL

CA19-9=4.64 NL
sonography

1- massive pneumoperitoneum
2- distention of stomach
3- moderate ascetic fluid were reported
4- liver and spleen normal
5- pancreas no detect
1- RBC=490000 (traumatic)
2- WBC=1300
3- LDH=303
4- Alb=2.5
5- pro=3.1
6- PMN=70%
7- lymph=30%
8- Glucose=112

Culture=negative
After the correction of WBC counts according to RBC counts the ascetic fluid analysis result were low SAAG and high protein.
Echocardiography

1- Mild MR
2- EF=55-60%
Para clinic test
CXR
Upright and supine abdominal x-ray:
A lot of gas was seen in peritoneal cavity.
Abdominal-pelvic CT scan with IV-oral contrast
Small bowel transit
پیامرس آزمون کاستن نشته‌‌کرد

پداقم الی موحیت

خندان ماما همه‌‌هم سرم یاده‌‌رود
Radiological diagnosis of pneumoperitoneum

The value of a chest X-ray in the visualisation of intraperitoneal free gas was first suggested by Popper in 1915 who detected subphrenic collections of gas in the diagnosis of perforated peptic ulcer.

Vaughan and Brams demonstrated the presence of subphrenic free gas in 26 of 29 proven cases of acute perforation of peptic ulcers and subsequent series confirmed an 87-100% accuracy for the detection of free gas on an erect chest X-ray.
Is presence of gas in subphrenic area = pneumoperitoneum
**Pseudo-pneumoperitoneum**

- Sever obstruction
- Sub-diaphragmatic fat
- Atelectasia of inferior lobe of Rt lung
The **Rigler's sign**, also known as the **double wall sign**, is seen on an x-ray of the abdomen when air is present on both sides of the intestine.
Since Pneumoperitoneum is most common result of visceral perforation, we candidate the patient to immediate surgery.
But the patient run away from hospital...
But after few days, He came back to our hospital with complain of deterioration of abdominal pain and distention!!!
We candidate him to Endoscopy, colonoscopy and small bowel transit.
Upper GI Endoscopy:

- Stomach:
  Fundus, body and antrum were normal. There was one deformed pyloric erythemathous lesion around it, multiple biopsies were taken.

- Duodenum:
  Passing to Bulb was not possible.
BIOPSY

A/Gastric cardia mucosa biopsy:
1- Barret esophagitis
2- Esophageal ulcer.

B/pyloric mucosa biopsy:
1- Chronic active gastritis
2- intestinal metaplasia
Lower GI endoscopy:

hemorrhoid grade 2
stomach was dilated, the pylorous was narrowed. 

**Balloon dilatation of pylorus** was done and after insertion duodenum seemed normal.
Small bowel transit was suspicious to:

Intestinal malrotation
Intestinal malrotation
EPIDEMIOLOGY

- Rotational anomalies are not uncommon
- Asymptomatic: 1/200 and 1/500 live births
  Symptomatic in 1/6000 live births.
- age distribution:
  - Infants under one year of age: 31 percent
  - Children one to 18 years of age: 21 percent
  - Adults over 18 years of age: 48 percent
Normal intestinal rotation
Normal mesenteric fixation
Normal small bowel mesenteric attachment

Fixation in malrotation
Shortened mesenteric attachment
Volvulus

- 22% of older children and 12% of adults with malrotation

- Onset of symptoms is usually acute

- Some children and adults present with a more chronic pattern of episodic vomiting and abdominal pain suggestive of **intermittent volvulus** over the course of weeks to months to years
Duodenal obstruction

• In neonates, malrotation can also present as duodenal obstruction. The obstruction may be caused by Ladd bands or associated duodenal atresia.
Most common complain in adult:

• Intermittent Abdominal pain

• Intermittent vomiting
## Malrotation in adult

<table>
<thead>
<tr>
<th>Un common manifestation</th>
<th>Miss diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• failure to thrive</td>
<td>• allergy</td>
</tr>
<tr>
<td>• solid food intolerance</td>
<td>• IBS</td>
</tr>
<tr>
<td>• malabsorption</td>
<td>• functional abdominal pain</td>
</tr>
<tr>
<td>• protein-losing enteropathy</td>
<td>• cyclic vomiting</td>
</tr>
<tr>
<td>• pancreatitis</td>
<td></td>
</tr>
<tr>
<td>• peritonitis</td>
<td></td>
</tr>
<tr>
<td>• biliary obstruction</td>
<td></td>
</tr>
<tr>
<td>• motility disorders</td>
<td></td>
</tr>
<tr>
<td>• chyious ascites</td>
<td></td>
</tr>
</tbody>
</table>
Small bowel transit was suspicious to malrotation and ascitis fluid analysis was low SAAG:

we candidate him to laparoscopy.
Laparotomy instead of laparoscopy!!!!!!
Although presence of low SAAG Ascitis and abnormal intestinal serosa, biopsy was not been taken.
Neither intestinal malrotation nor any sign of viscous perforation was found during surgery.
Approach to a patient with pneumoperitoneum
What is the other cause(s) of pneumopretunium?
Pneumoperitoneum

• Surgical Pneumoperitoneum : (>90%)

• Non-Surgical Pneumoperitoneum or spontaneous pneumoperitoneum (SP): (<10%)
### Extra-abdominal causes of pneumpritonium

#### Intra-Thoracic
- positive pressure ventilation
- pneumothorax/pneumomediastinum
- pulmonary sepsis
- thoracic trauma
- cardiopulmonary resuscitation
- barotrauma

#### Gynaecologic
- vaginal douching
- post-partum exercises
- oral-genital insufflation
- coitus
## Abdominal causes of pneumoperitoneum

<table>
<thead>
<tr>
<th>Common</th>
<th>Rare</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>pneumatosis cystoides intestinalis</strong></td>
<td>• Intra-abdominal sepsis from gas-forming organisms</td>
</tr>
<tr>
<td>• after gastrointestinal endoscopy</td>
<td>• amyloidosis</td>
</tr>
<tr>
<td>• iatrogenic, eg, postoperative</td>
<td>• idiopathic</td>
</tr>
</tbody>
</table>
Pneumatosis intestinalis (PI)

- presence of gas within the wall of the small or large intestine
- first description in 1783 by Du Vernois, PI has appeared in the literature under many names:
  - pneumatosis cystoides intestinalis
  - intramural gas
  - pneumatosis coli
  - pseudolipomatosis
  - intestinal emphysema
  - bullous emphysema of the intestine
  - lymphopneumatosis
Causes of pneumatisos

- Intraabdominal catastrophe (Intestinal ischemia)
- Mucosal disruption (PUD, IBD)
- Infections (Clostridium difficile, TB)
- Pulmonary disorders (COPD, CF)
- Endoscopic procedures
- Diseases affecting gastrointestinal motility (DM, SSC)
- Immunological disturbances (HIV, CVD)
- **Idiopathic (15% in the fifth to eighth decade)**
### Pneumatosis symptoms

<table>
<thead>
<tr>
<th>Small Intestine</th>
<th>Large Intestine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vomiting</td>
<td>Diarrhea</td>
</tr>
<tr>
<td>Abdominal distention</td>
<td>Hematochezia</td>
</tr>
<tr>
<td>Weight loss</td>
<td>Abdominal discomfort</td>
</tr>
<tr>
<td>Abdominal discomfort</td>
<td>Abdominal distention</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>Constipation</td>
</tr>
<tr>
<td>Anorexia</td>
<td>Weight loss</td>
</tr>
<tr>
<td>Constipation</td>
<td>Tenesmus</td>
</tr>
</tbody>
</table>
• Most patients with PI are asymptomatic and probably never come to clinical attention.

• Complications of PI occur in approximately 3%:
  - small and large bowel obstruction
  - volvulus
  - intussusception
  - pneumoperitoneum
  - hemorrhage.
Abdominal x-ray

Intramural gas was detected in approximately two-thirds of affected patients.
Characteristic findings of PI on CT scan include circumferential collections of air adjacent to the lumen of the bowel that run in parallel with the wall of the bowel, but without the air-contrast or air-fluid levels characteristically seen with intraluminal air.
Although all clinical findings were compatible to diagnosis PI, any imagining studies was not suggested this diagnosis.
### Abdominal causes of pneumoperitoneum

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1. Primary or AL amyloidosis (1% GI involvement)
2. Reactive (secondary) or AA amyloidosis (75% GI involvement)
3. Dialysis-related amyloidosis
4. Senile systemic amyloidosis (SSA)
## Gastrointestinal Amyloidosis

<table>
<thead>
<tr>
<th>Mucosal infiltration</th>
<th>Neuromuscular infiltration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• AA amyloidosis</td>
<td>• AL amyloidosis</td>
</tr>
<tr>
<td>• fine granular appearance</td>
<td>• Constipation</td>
</tr>
<tr>
<td>• mucosal friability</td>
<td>• mechanical obstruction</td>
</tr>
<tr>
<td>• Erosions</td>
<td>• chronic intestinal pseudo-obstruction</td>
</tr>
<tr>
<td>• diarrhea and malabsorption</td>
<td></td>
</tr>
</tbody>
</table>
Spontaneous pneumoperitoneum: an unusual complication of systemic reactive AA amyloidosis secondary to rheumatoid arthritis.

Matsuda M, Nishikawa N, Okano T, Hoshi K, Suzuki A, Ikeda S.

Division of Rheumatology, Third Department of Medicine, Shinshu University School of Medicine, 3-1-1 Asahi, Matsumoto 390-8621, Japan. matsuda@hsp.md.shinshu-u.ac.jp
Diagnosis

- **high index of suspicion** in patients with disorders known to be associated with amyloidosis.
- **biopsy of duodenal or colorectal mucosa**, which is more sensitive than a fat biopsy.
In addition of not compatible clinical setting Involvement of GI and specially as SP in primary amyloidosis is extremely rare that we can take it as diagnosis.
• Pneumopretunium was discussed in GI malignancy due to perforation of viscous by malignant infiltration.

• Pneumopretunium was reported in tuberculosis simultaneously by involvement of pulmonary tuberculosis.

• No correlation between Heroin abusing and Pneumopretunium and Ascitis was detected.
## Abdominal causes of pneumoperitoneum

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<td>✓ idiopathic</td>
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</table>
Are all of you agree with me in diagnosis idiopathic spontaneous pneumopritunium?
We need to rule out surgical and all of the another causes of non surgical idiopathic spontaneous pneumopritunium for diagnosis pneumopritunium ...
It has been proposed that in some cases with idiopathic pneumoperitoneum, a subclinical small visceral perforation may have occurred.
Clinical manifestations of perforated PUD:

- Acute perforation
- Micro or limited perforation
Micro or limited perforation

- If the perforation is walled off or if the gastric fluid is confined by fibrosis, symptoms may be much less severe and these phases may not be apparent.

- Posterior (retroperitoneal) perforation is another situation where symptoms are less dramatic.

- Compared to free intraperitoneal perforations, the upper abdominal pain is more insidious, the presentation often delayed, and the abdominal examination is frequently equivocal.
Possible diagnosis:

Micro perforation of PUD
Presence of GOO can be a sign of complicated PUD.

Upper GI endoscopy: one deformed pylorus with erytemathous lesion.

No any sign of the other disease that can cause pneumopritunim (in clinic and paraclinic and surgery)

Ascitis that disappear fastly.

Partial improvement in follow-up.

Our key points for potential diagnosis of micro perforated PUD are:
ہم آناکو عقہ افراد اندازاندہ
وہم آناکو عقہ افراد انداز آنداز
نبی علی نہم اطالب علی السلام حکم کنند کنند...
دل آرام بنشبیاباد خدا