TO OPERATE OR NOT TO OPERATE: THAT IS THE QUESTION

APPENDECTOMY VS ANTIBIOTICS ONLY

FOR ACUTE UNCOMPLICATED APPENDICITIS

Dr. Megan Wolthuis-Grunander, MD, FACS

General Surgery, Trauma/Surgical Critical Care

Assistant Director of Trauma and ICU Ogden Regional Medical Center

OGDEN **CLINIC**

We specialize in you.

DISCLOSURE

This presentation has no commercial vendor and is not supported financially by any commercial vendor. I received no financial remuneration from any commercial vendor related to this presentation.

OGDEN CLINIC
We specialize in you.

APPENDIX- WHAT IS YOUR PURPOSE?!?

--Blind ending tube connected to the cecum, from which it develops embryologically

--Long accepted that the appendix contains Gut Associated Lymphoid Tissue (GALT)

--Notion remained that it may only be vestigial as there was thought to be an absence of side effects following its removal

OGDEN **CLINIC**

We specialize in you.

APPENDIX- WHAT IS YOUR PURPOSE?!?

--Proposed at Duke in 2007 that the appendix serves as a haven for useful bacteria when illness flushes those bacteria from the remainder of the intestine

--Subsequent research at Winthrop University revealed that individuals without an appendix were 4 times more likely to have recurrence of Clostridium Difficile colitis

OGDEN CLINIC
We specialize in you.

APPENDIX- WHAT IS YOUR PURPOSE?!?

--Also has recently been identified as an important component of mammalian mucosal immune function, particularly B-lymphocyte mediated immune responses and extrathymically derived T-lymphocytes

--Contains lymphatic vessels that regulate pathogens

OGDEN CLINIC
We specialize in you.

APPENDICITIS

--Occurs because of obstruction of the lumen of the appendix leading to edema, reduction of the appendiceal blood flow, and inflammation.

--In children, obstruction may be caused by hypertrophy of appendiceal lymphoid tissue

--In adults, fecaliths are a common cause

--Appendiceal tumors

--Lifetime risk of developing 7-9%

OGDEN CLINIC
We specialize in you.

APPENDICITIS

--As the process progresses, necrosis of appendiceal tissue may develop along with bacterial overgrowth leading to perforation and extensive periappendiceal inflammation

--Perforation is not inevitable

--Mortality is < 1% but approaches 15% in elderly patients with comorbid conditions

OGDEN CLINIC
We specialize in you.

DIAGNOSIS OF APPENDICITIS

--Periumbilical localized to RLQ pain

--Fever, nausea/emesis, anorexia

--Physical exam

-pain at McBurneys Point, Rovsings Sign

--Laboratory Studies

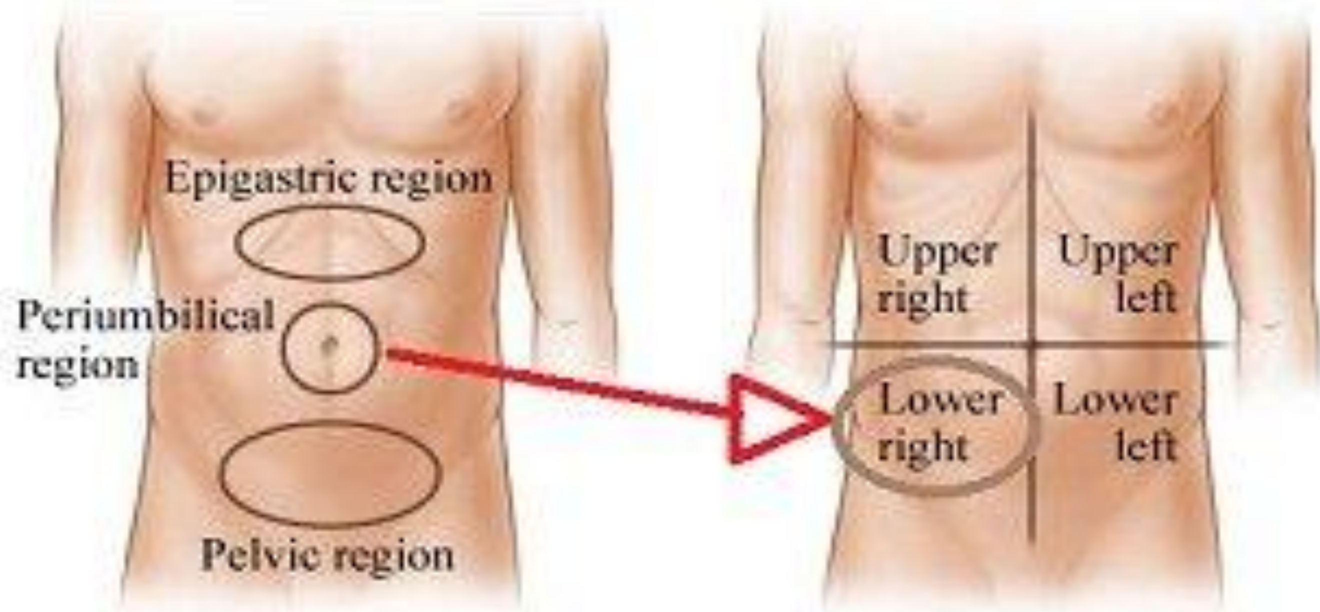
--Ultrasound

--CT A/P with oral and IV contrast

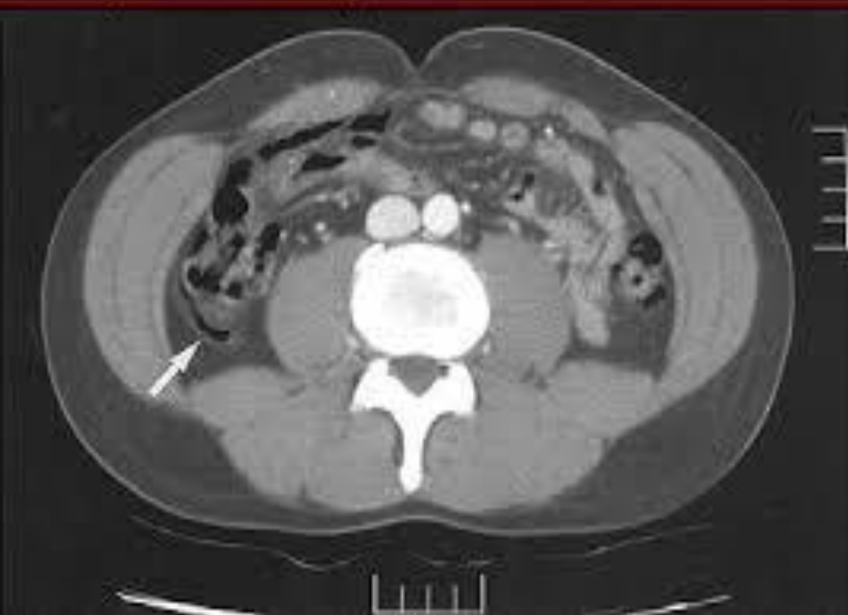
--MRI in pregnant patients

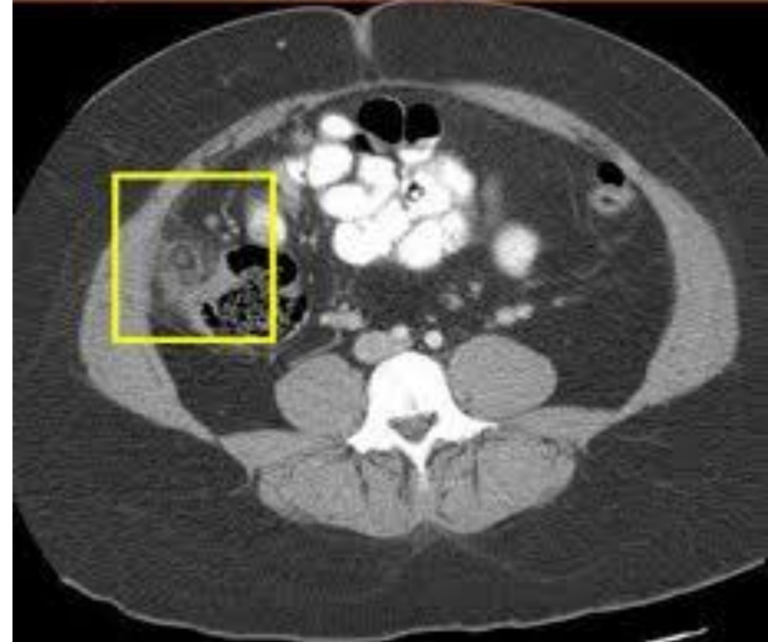
OGDEN **CLINIC**

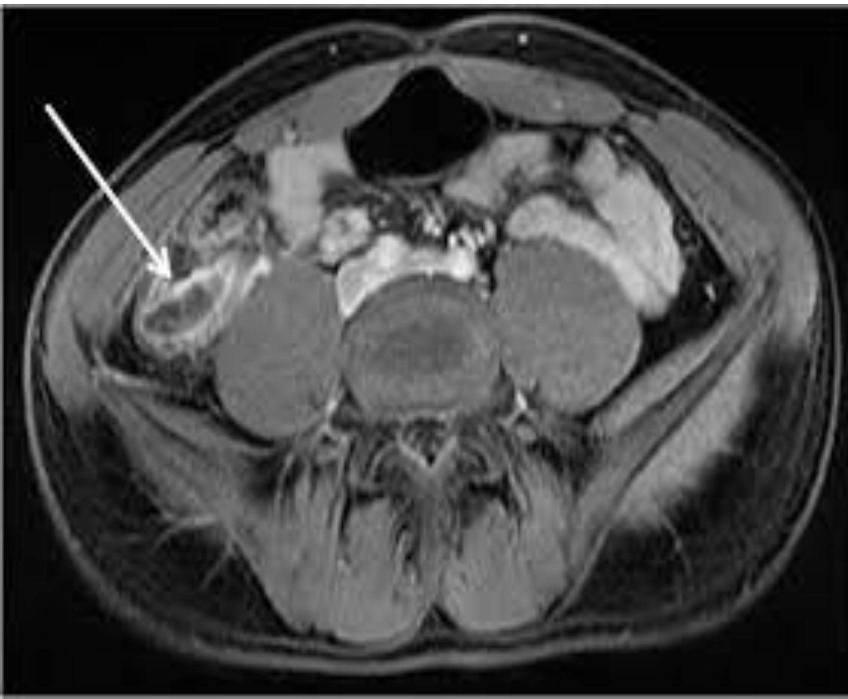
We specialize in you.



Progression of Pain in Appendicitis


Medscape® www.medscape.com


Medscape® www.medscape.com



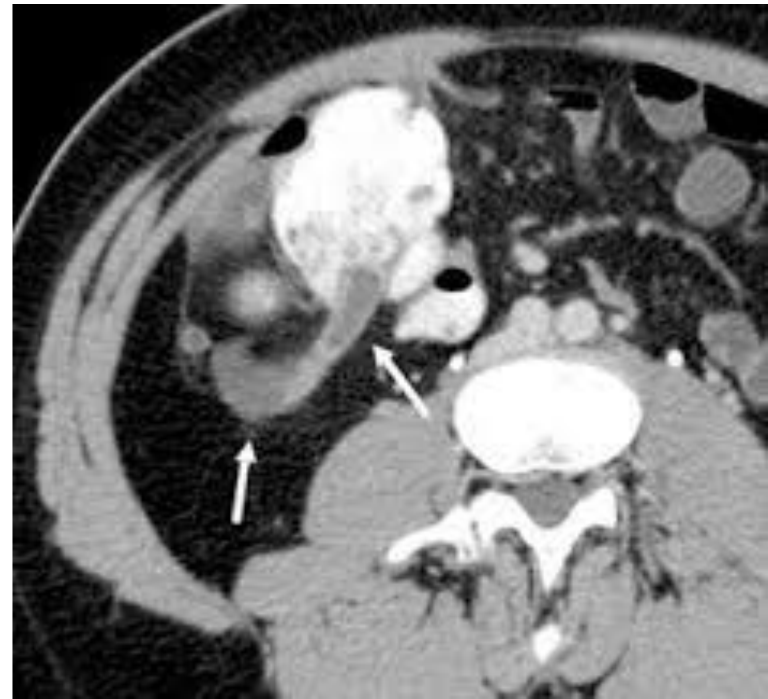
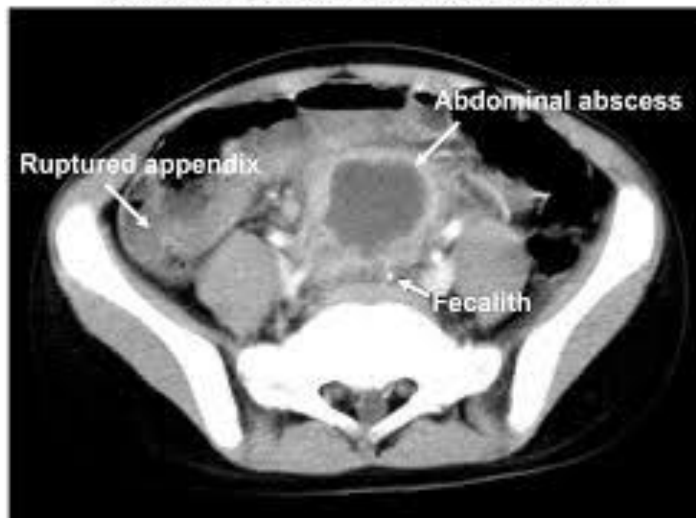


Figure 5. CT scan showing ruptured appendix with formation of an abscess in the abdomen.



RUPTURED APPENDICITIS

--Symptoms lasting > 24 hours

--Fecalith

--Findings on CT A/P of abscess, phlegmon

--Treatment consists of IV antibiotics and CT-guided drainage of abscess if possible unless peritonitis is present

--If operate, at high risk of open procedure and possibly an ileocecectomy

--Interval appendectomy

OGDEN CLINIC
We specialize in you.

APPENDECTOMY

--First appendectomy performed by Claudius Amyand, a naturalized British surgeon of French descent in the mid-eighteenth century on an 11 year old boy with an inguinal hernia containing an inflamed appendix

--Pathologic features of appendicitis were documented by Reginald H. Fritz in 1886

--One of the most common emergency surgeries in the US

OGDEN CLINIC
We specialize in you.

APPENDECTOMY

--Laparoscopic appendectomy now the standard

--Outpatient procedure as > 90% discharge to home within 23 hours of surgery

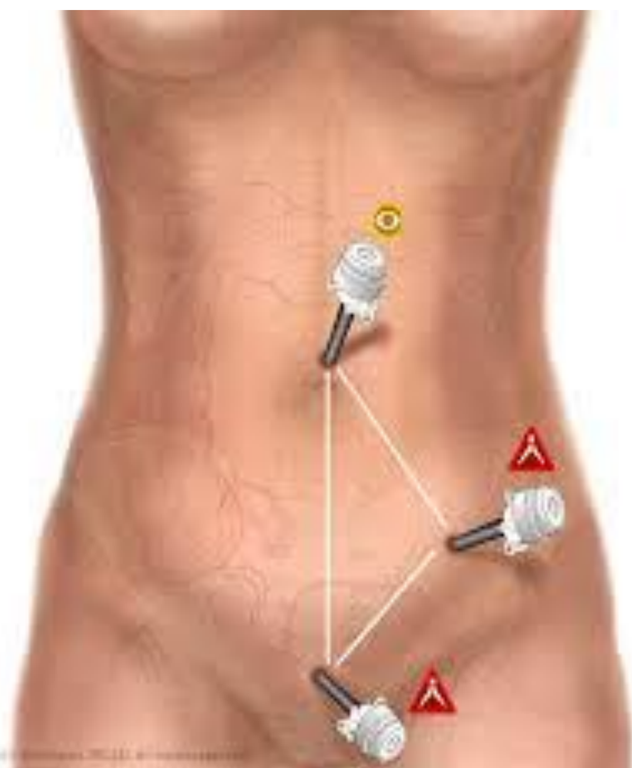
--Return to work within 5-7 days

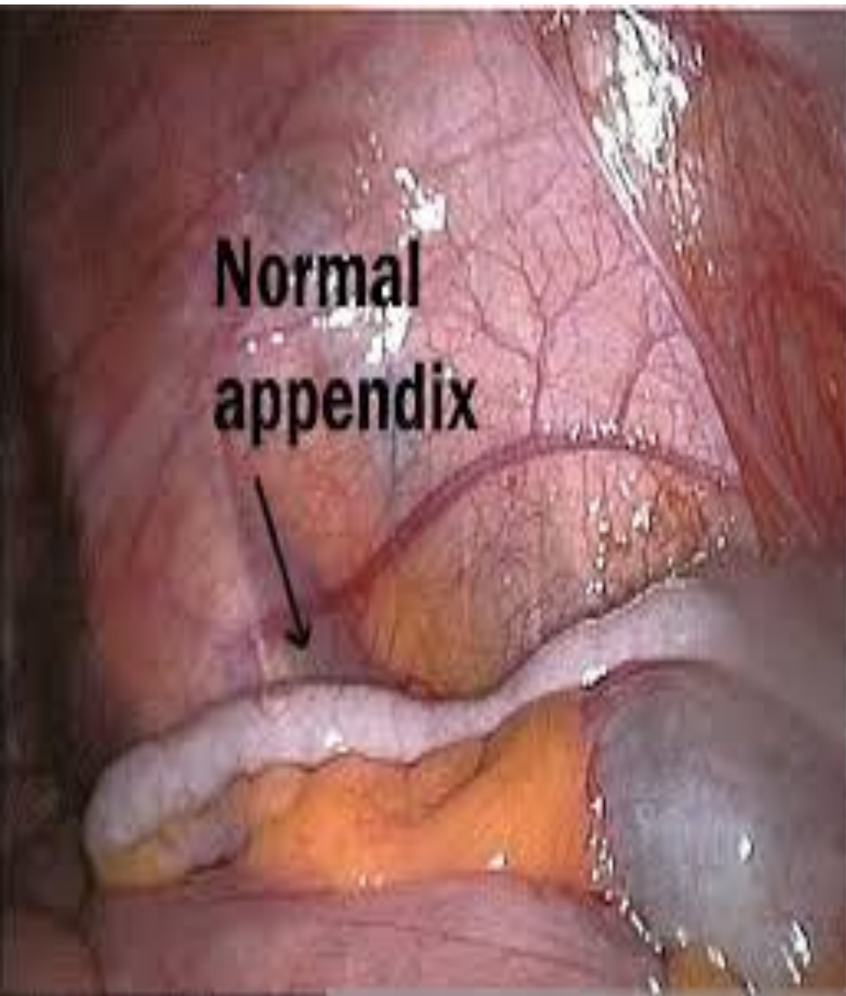
--No lifting, pushing or pulling > 10 pounds x 4 weeks

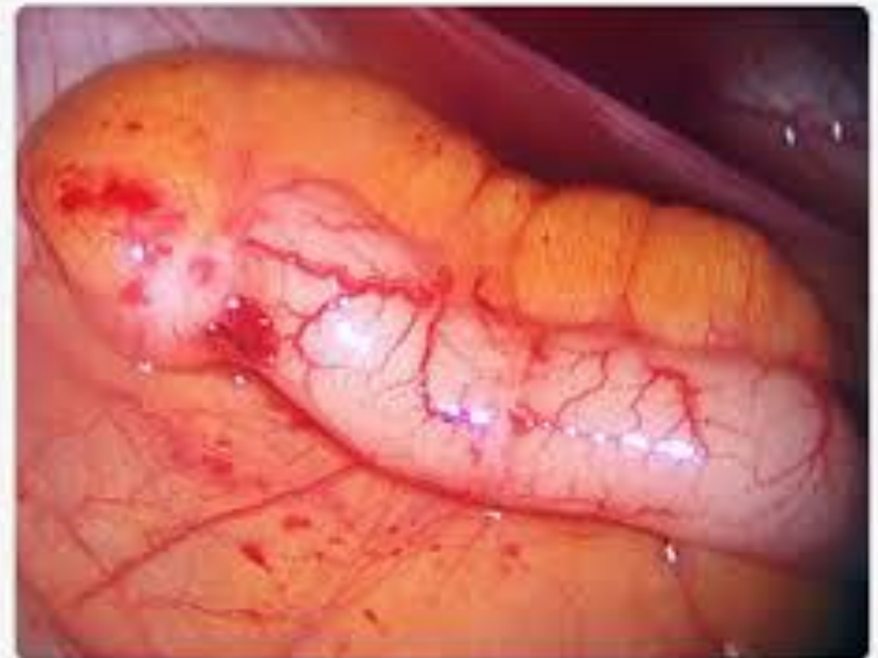
--Average cost $23,000

OGDEN **CLINIC**

We specialize in you.




Normal
appendix



ANTIBIOTICS ONLY

--"HOT TOPIC" because of several recent papers

--The NOTA Study Annals of Surgery July 2014

--APPAC Trial JAMA June 2015

--Evidence for an Antibiotics-First Strategy for Uncomplicated Acute Appendicitis in Adults JACS November 2015

--Nonoperative Protocols for Early Acute Appendicitis NEJM November 2015

OGDEN **CLINIC**

We specialize in you.

NOTA STUDY

--159 patients in 2010

--Treated with 7 days of Amoxicillin and Clavulanic Acid (Augmentin)

--7 day failure rate 11.9%

--After 2 years, overall recurrence rate was 13.8%

-14 of 22 patients treated successfully with another course of antibiotics

OGDEN CLINIC
We specialize in you.

APPAC TRIAL

--November 2009 – June 2012 in Finland

--530 patients enrolled with 1 year follow up via telephone at specified intervals

--Those randomized to antibiotic therapy received IV Ertapenem for 3 days followed by 7 days of PO Levofloxacin and Flagyl

--In antibiotic group, 27.3% had appendectomy performed within 1 year

--Outcome was to assess non-inferiority as set by prespecified criteria

-24% used as cutoff

OGDEN **CLINIC**

We specialize in you.

COST OF ANTIBIOICS ONLY

--$24,000 for 3 days of antibiotics then additional 5-7 days of PO antibiotics

--Cost of laparoscopic appendectomy $23,000

--Unable to quantify cost for multiple visits to evaluate abdominal pain as possible treatment failure, repeat imaging, additional lost days of work with readmission, subsequent surgery

OGDEN CLINIC

We specialize in you.

WHY IS SURGERY STILL BEING DONE?

--All the studies have major flaws

--Poor definition of disease and no clear diagnostic criteria

-appendix size of 6 mm (which is normal)

--No clear guidelines as to IV vs PO, length of treatment

--No specific antibiotic given… major study used Imipenem (>$1000 per dose) and risk of developing antibiotic resistance given such broad spectrum

--All studies used open appendectomy as surgical intervention

--No clear definition of antibiotic failure thus failure rates were highly variable

OGDEN CLINIC

We specialize in you.

WHAT WE DON'T KNOW ABOUT A-O APPROACH THAT COULD HURT US

-- Optimal criteria for selecting patients

--Reliable predictors of which patients will be at higher risk of failure

--Optimal antibiotic choice and regimen

-PO vs IV

--Can A-O management be done safely as an outpatient

--The longer term (>5 year) outcomes and recurrence

--Incidence of missed neoplasms and malignancies

--More data comparing A-O to laparoscopic appendectomy

--Safety and efficacy at the extremes of ages

-< 5 and > 65

OGDEN **CLINIC**

We specialize in you.

WHAT WE DON'T KNOW ABOUT A-O APPROACH THAT COULD HURT US

--Does antibiotic treatment increase hospital utilization, and therefore cost, both during the initial phase of treatment and for recurrences

--Although high-risk patients (older, immunocompromised, medical comorbidities) could potentially benefit the most from A-O, they were excluded from all the trials

OGDEN **CLINIC**

We specialize in you.