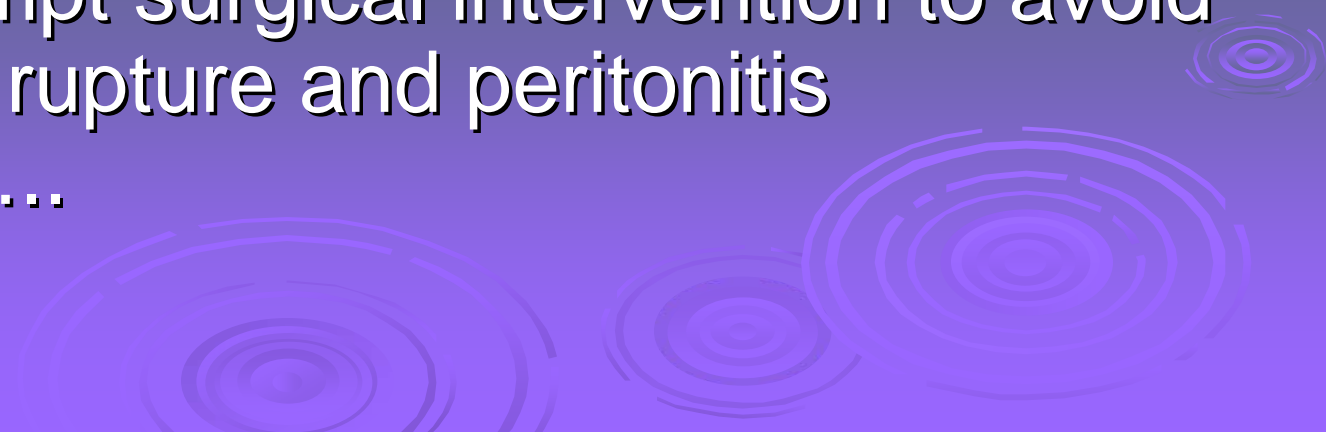



APPENDICITIS AND ITS APPEARANCES ON CT



APPENDICITIS

- Results from acute inflammation of the appendix.
 - Most common abdominal surgical emergencies.
 - Diagnosis usually clinical based on physical exam and lab studies the aim being prompt surgical intervention to avoid the risk of rupture and peritonitis however.....
- 

CLINICAL PRESENTATION

- Classic presentation with RIF pain only in 60%
 - Dx may be missed or delayed if
 - atypical location of appendix,
 - extremes of age,
 - Pregnancy/gynae pathology
 - Overall clinical accuracy = 80% resulting in false negative surgery in 20%
 - Accuracy in men: 78-92%
 - Accuracy in women: 58-85%
- 

Pathophysiology

Luminal obstruction
secondary to

- Faecolith (in 11-52%)
- Lymphoid hyperplasia
- Foreign body
- Parasite
- Tumour primary or secondary



PATHOPHYSIOLOGY

```
graph TD; A[PATHOPHYSIOLOGY] --> B["DISTENSION stimulates visceral nerves and cause pain, nausea and vomiting 4-6 hrs"]; A --> C["VASCULAR ENGORGEMENT leads to ischaemia and transmural Inflammation causing pain"];
```

DISTENSION
stimulates
visceral nerves and
cause pain, nausea
and vomiting 4-6 hrs

**VASCULAR
ENGORGEMENT**
leads to ischaemia and
transmural
Inflammation causing
pain

RADIOLOGY NORMAL APPENDIX

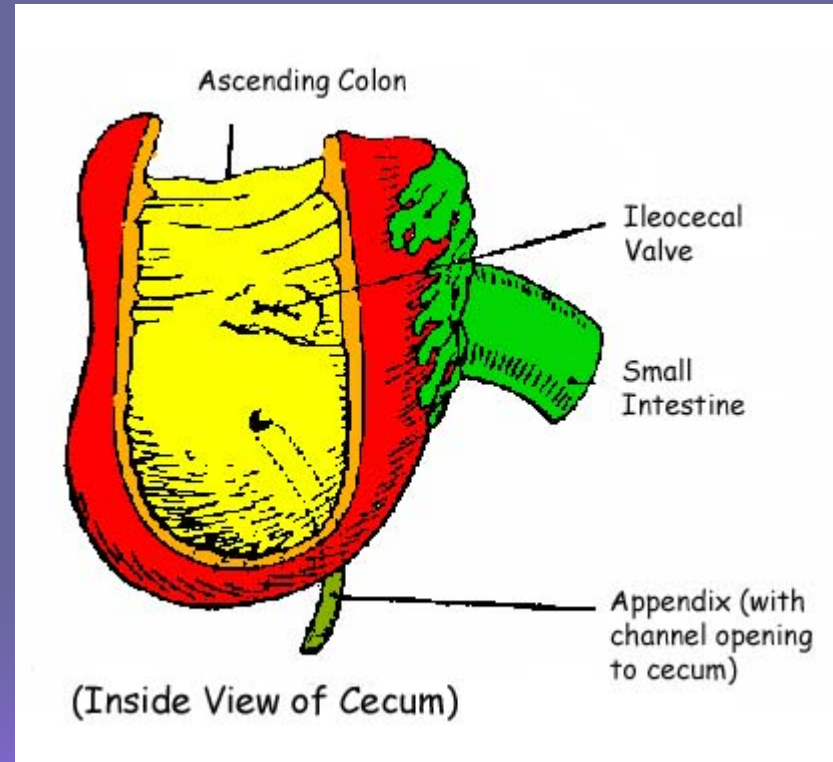
- Incidence of visualization of normal appendix on unenhanced CT 79% increases to 90-100% if rectal contrast given.

“In the absence of a distinctly visualized appendix and secondary inflammatory changes, the incidence of acute appendicitis is low. Nonvisualisation of the appendix even when a small amount of fat is present in the right lower quadrant may safely exclude acute appendicitis if no secondary CT findings are present. “Nicolaidis et al AJR 2004

- Mean thickness 6.6mm (range 4-11mm)

NORMAL POSITION OF THE APPENDIX

- Location of appendiceal tip: 62% paracolic, 19% pelvic, 9% midline, 10% retrocaecal, <1% sub hepatic
- Relationship of base of appendix to ileocaecal valve: 96% caudal, 4% cephalic
- Relationship of base of appendix to ileocaecal valve: 91% posterior, 0% anterior, 8% medial, 1% lateral



CT in acute appendicitis

- **Advantages over US**

 - Operator independent**

 - Not affected by patient's body habitus**

 - Also readily available, easy to interpret**

- **Sensitivities 90-100%**

- **Specificities 91-99%**

CT in appendicitis- technical issues

- 5mm thin slices
- Use oral and i/v contrast if possible
- i/v contrast helps to demonstrate enhancement of the inflamed appendix and aids its visualisation
- Oral contrast helps to identify caecum and TI . Oral contrast in the appendix makes diagnosis of acute appendicitis unlikely

CT FINDINGS IN ACUTE APPENDICITIS

- Inflamed appendix usually 7-15 mm in diameter
- Circumferential and symmetric wall thickening
- Homogeneous wall enhancement
- Peri-appendiceal inflammation: linear fat stranding, local fascial thickening, mesenteric haziness
- Focal, ceecal apical thickening
- Arrowhead sign- caecal contrast funnels to point of appendiceal occlusion

Sensitivities & Specificities of CT signs of appendicitis

Rao, et al. J. Comp Assit. Tomography. 1997;21:686

CT finding	Sensitivity	Specificity
<u>Fat stranding</u>	100%	80%
<u>Appendix > 6mm</u>	93%	100%
Adenopathy	62%	66%
<u>Appendicolith</u>	44%	100%
<u>Caecal thickening</u>	69%	100%
Paracolic fluid	18%	86%

CT Findings in Perforated Appendicitis

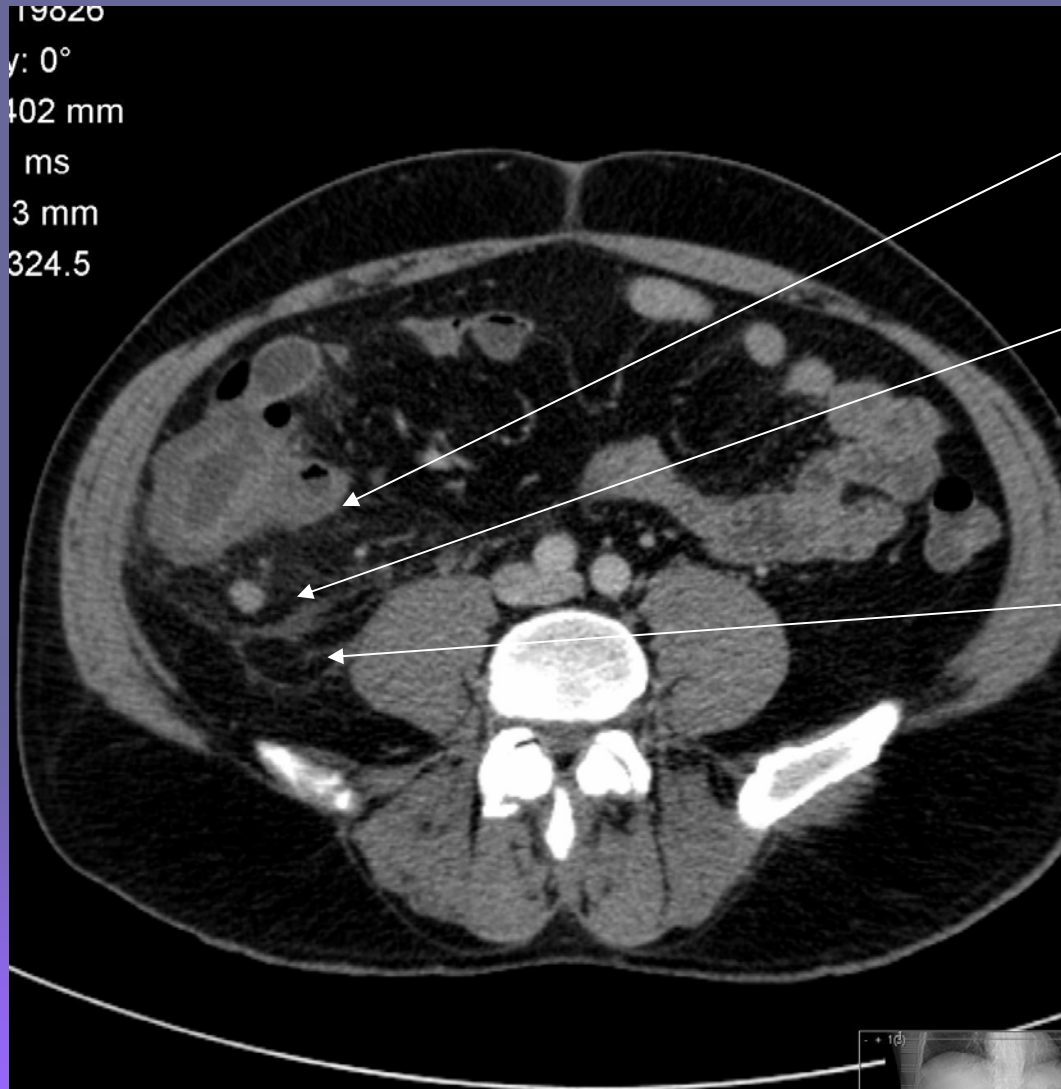
- Perforation in up to 20 per cent
- **Additional features in perforation**
 - Abscess
 - Extra-luminal air or extra-luminal
 - Appendicolith- 69% sensitivity if one sign is present
 - Defect in enhancing appendiceal wall
 - Phlegmon
 - Defect in enhancing wall had highest sensitivity of individual signs (64%)
 - 94.9% sensitivity if one of 5 signs is present

Impact of CT on Negative Appendectomy Rates

Negative appendectomy rate decreased:

- **22% to 4% Balthazar, et al. Am J Gastro 1998;93:768**
- **20% to 7% Rao, et al. Ann. Surg. 1999;229:344**
- **15.5% to 2% Applegate, et al. Radiology 2001;220:103**

CASES

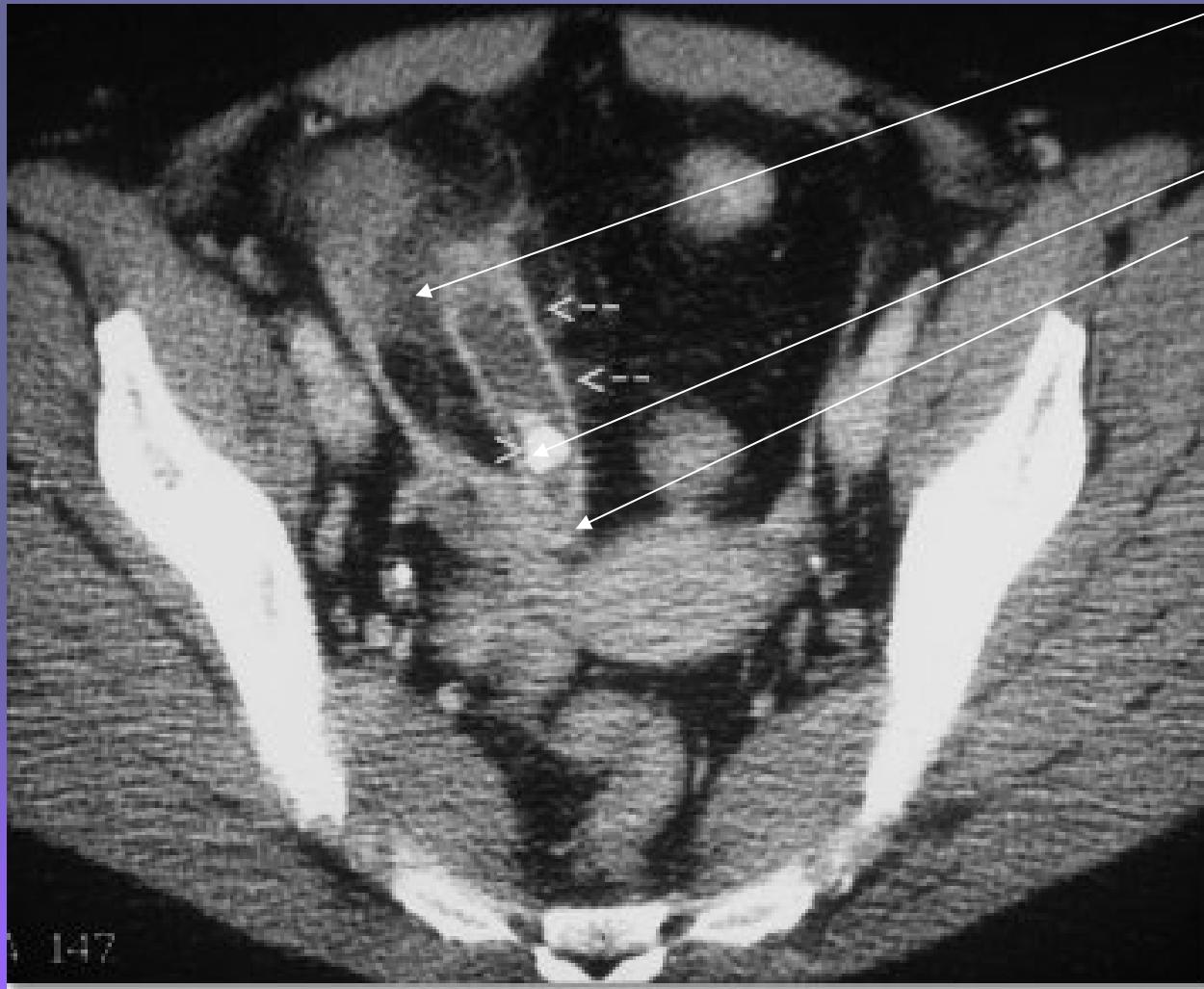


Distended appendix

Adenopathy

Fat stranding

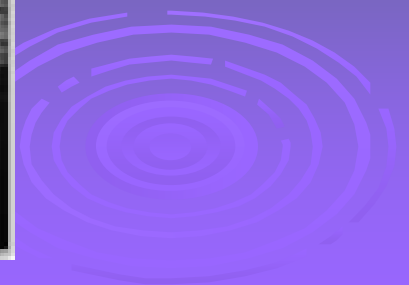
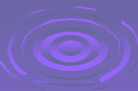
CASES



Fat stranding

Appendicolith

*Wall
enhancement*



CASES



Inflamed appendix and lack of oral contrast in patient with appendicitis.

CONCLUSION

- CT has excellent sensitivity and specificity
- Should be used only when diagnosis cannot be made on clinical grounds.
- Most useful CT signs fat stranding, abnormally dilated appendix and appendicolith if present.
- Should not delay surgery if clinically strong suspicion
- Remember to look for complications e.g. perforation, abscess etc

And remember to look for appendicitis when scan done for other reason e.g. CT KUB....

END

