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# Flat Lesions, Pitfalls and Difficult Case Review

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MEDICINE

# Overview

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- ◆ Discuss general approach to polyp candidates
- ◆ Sources of false positives and negatives with 2D and 3D review methods
- ◆ Work through problem solving polyp candidates
- ◆ Review current data on flat lesions
- ◆ ICV and anal verge

# Interpretation Algorithm

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## ◆ Density

- Look for high density, fat or air to quickly r/o polyp...don't use ROI measurements
- If soft tissue density then →

## ◆ Morphology

- Look for angular, needle or cubic shapes to r/o polyps
- If smooth and rounded margins→

## ◆ Mobility

- Compare supine/prone
- If mobile need to differentiate untagged mobile fecal debris from pedunculated polyp
- Beware of mobile colon segments!

# General Pitfalls To Avoid

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**Pay attention to technique and prep!**

- ◆ Poorly distended segments simulating constricting lesions or obscuring polyps
- ◆ Motion artifact simulating or obscuring polyps
- ◆ Poorly tagged adherent soft tissue density stool

## 2-D Review - False Positives

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- ◆ Untagged non-mobile stool
- ◆ Bulbous or complex folds
- ◆ Flexural pseudotumors
- ◆ Hypertrophic folds in diverticular disease

## 2-D Review - False Negatives

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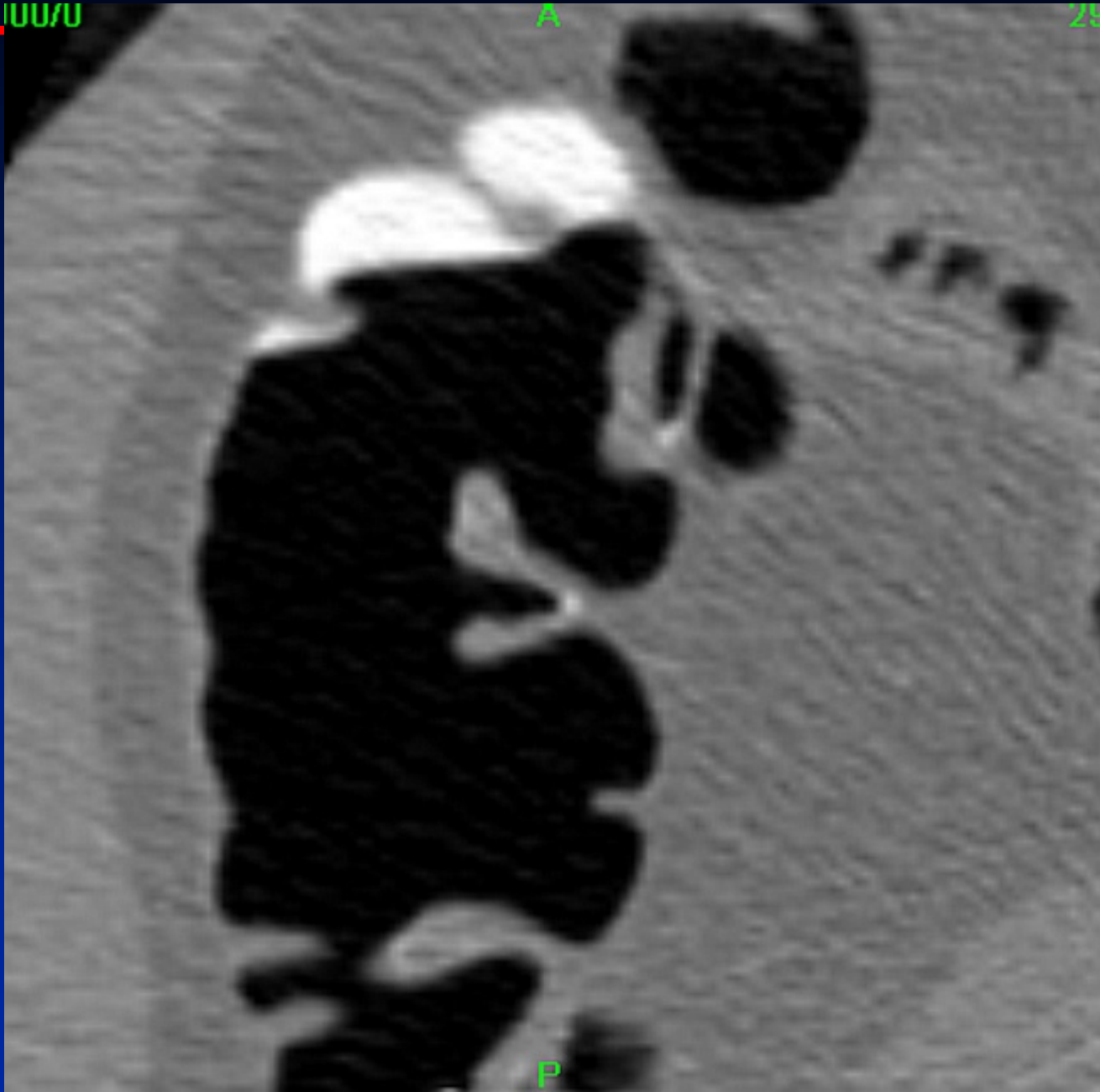
- ◆ Not perceiving a polyp
- ◆ Mischaracterizing a polyp as feces
  - Contrast on surface or within interstices of polyps
  - Contrast tagging on nondependent colon wall
  - Contrast or air trapped between polyp and colon wall....may need MPRs to see wall attachment
  - Polyp in mobile colon segment
  - Pedunculated polyp...look for stalk!
- ◆ Nonadenomatous polyps

# Bulbous Fold vs. Polyp?

100/0

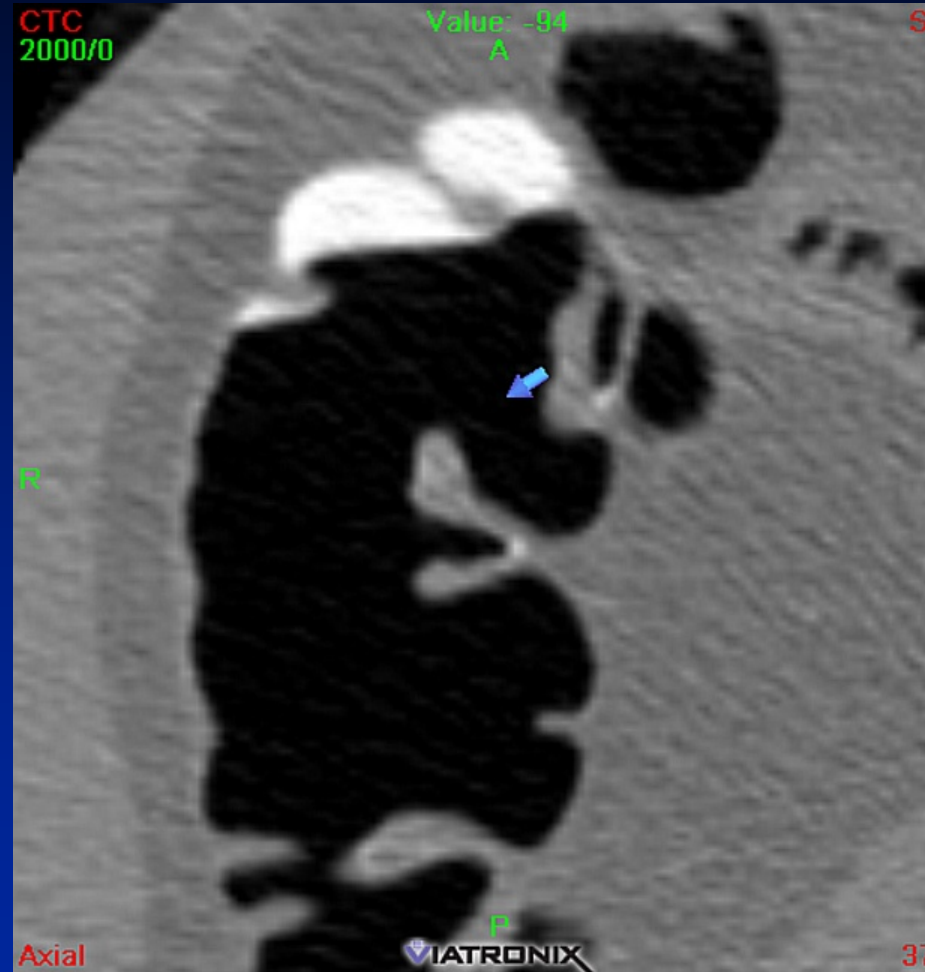
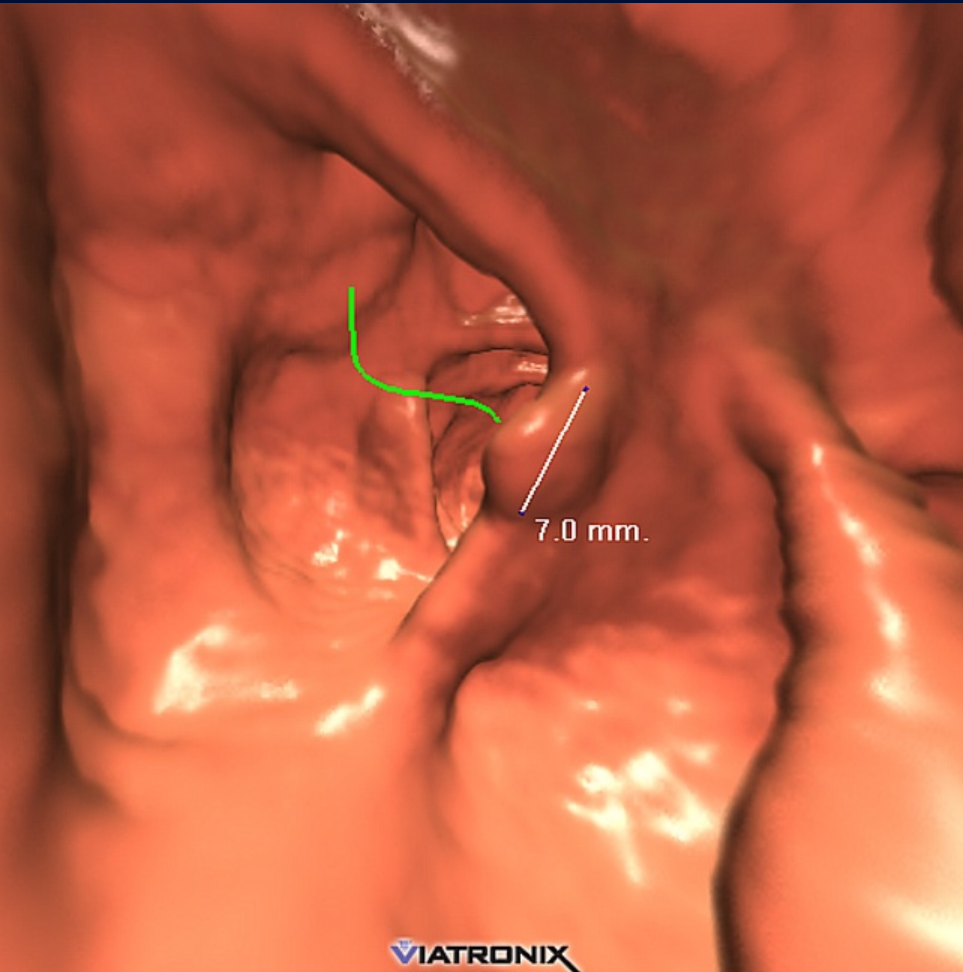
A

28



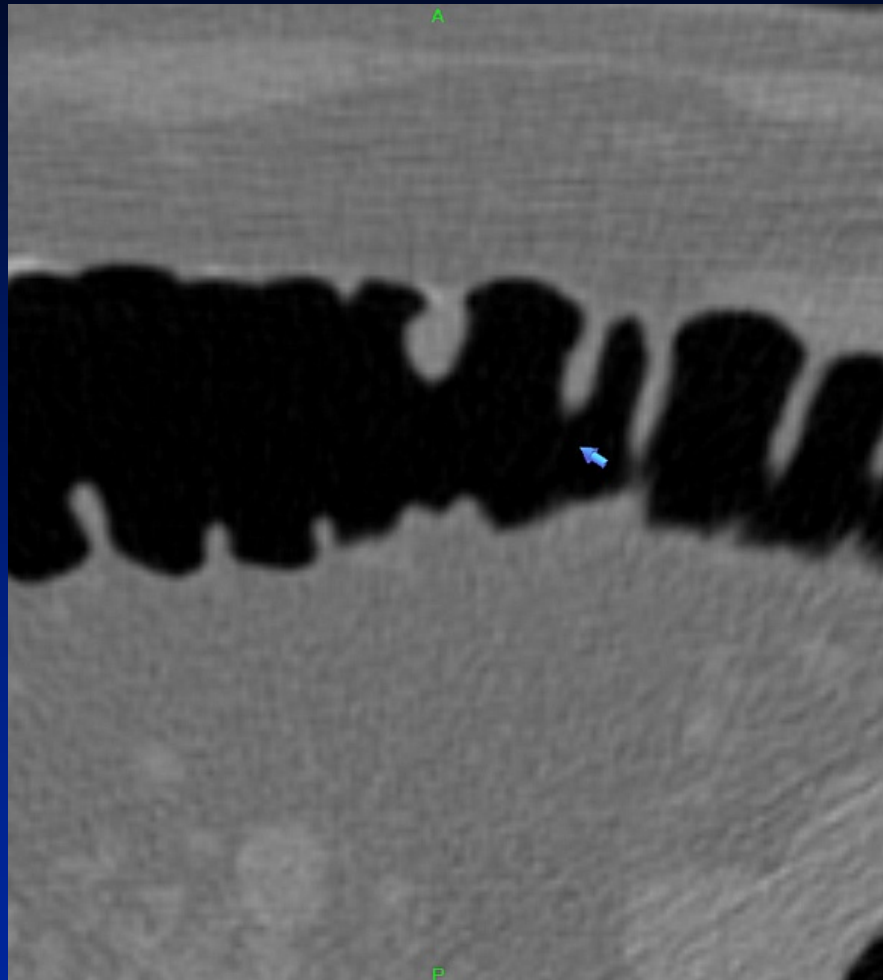
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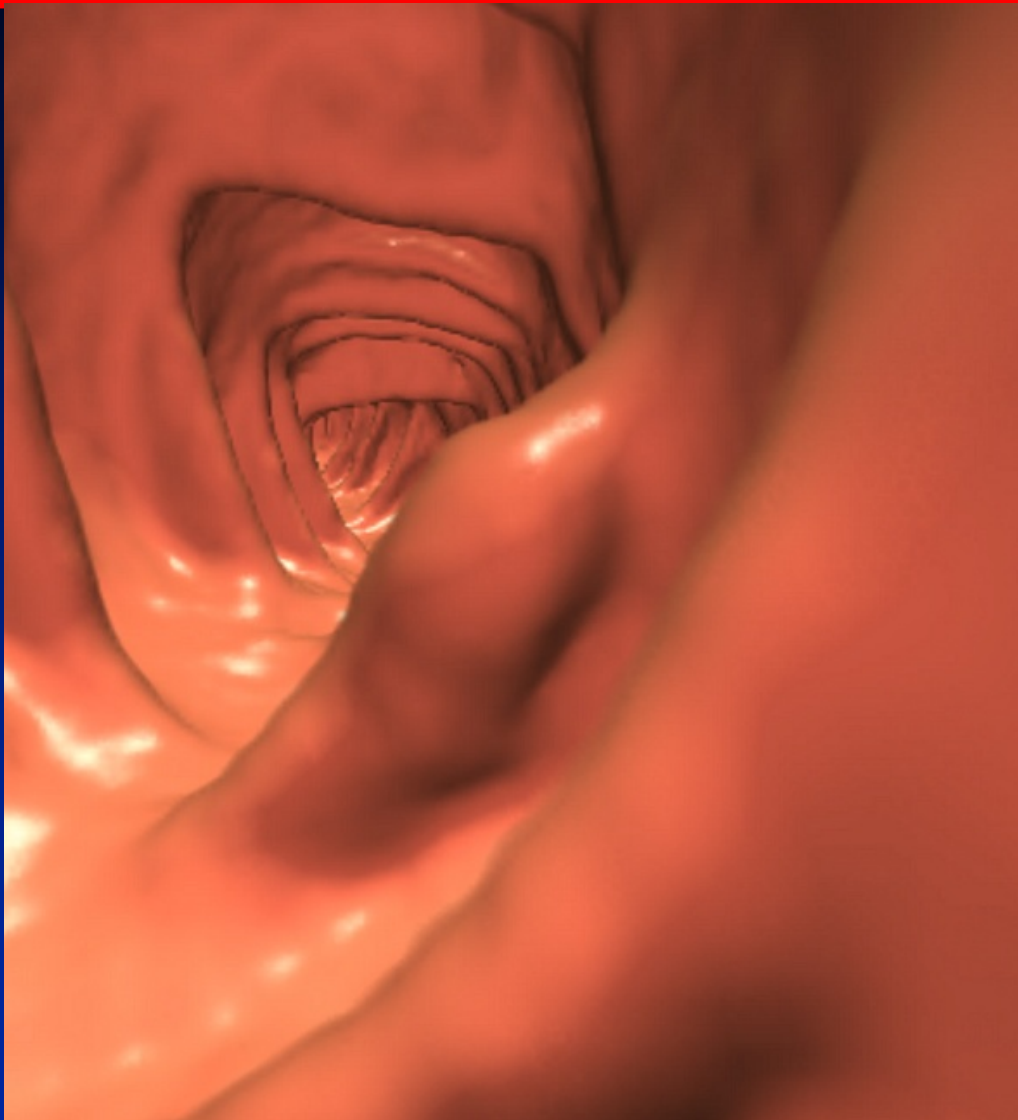
# Polyp Arising On A Fold



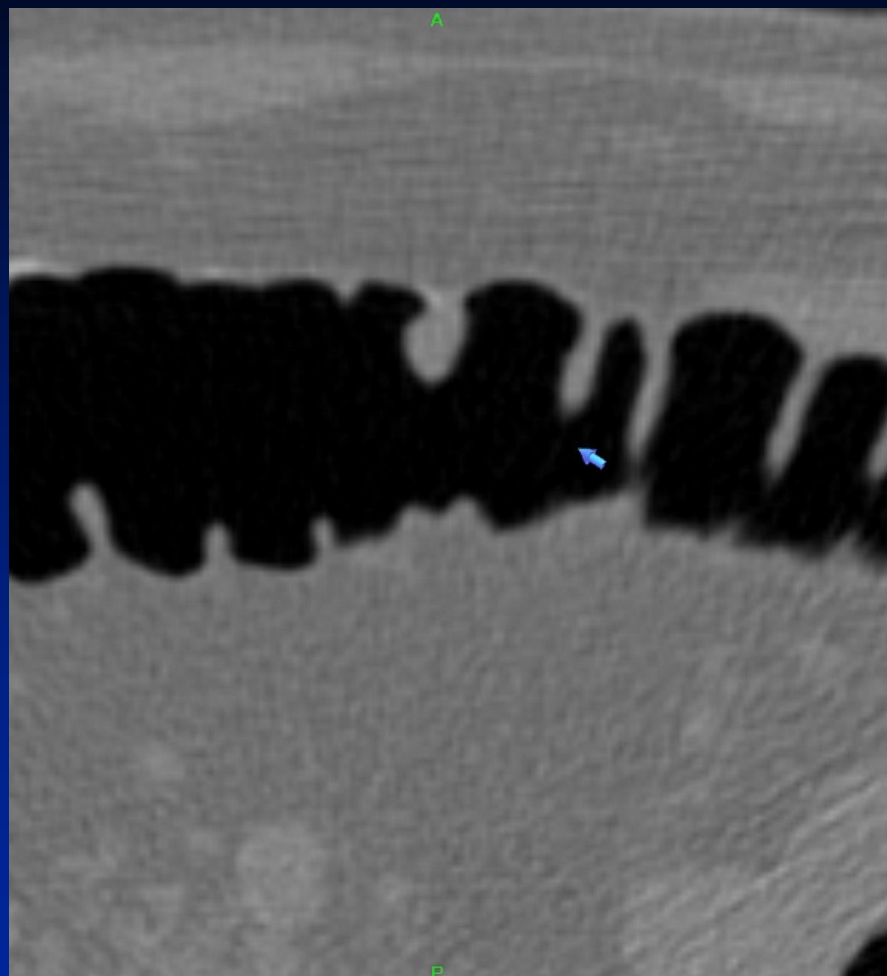
# Prone

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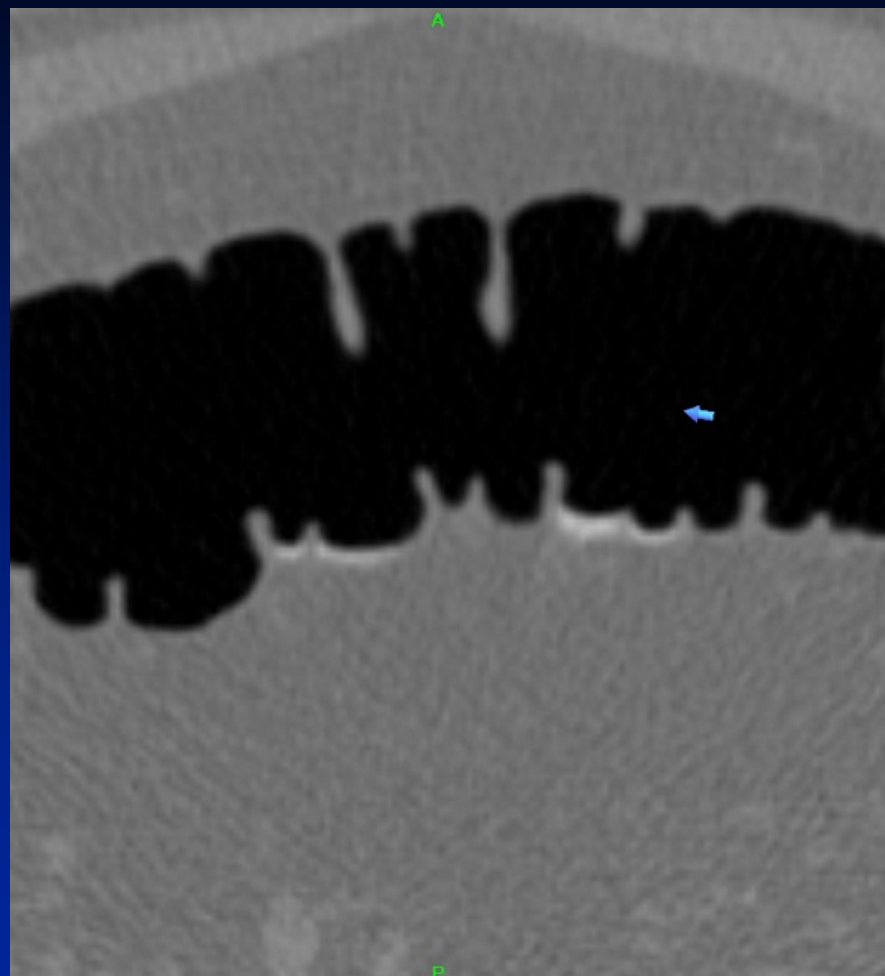




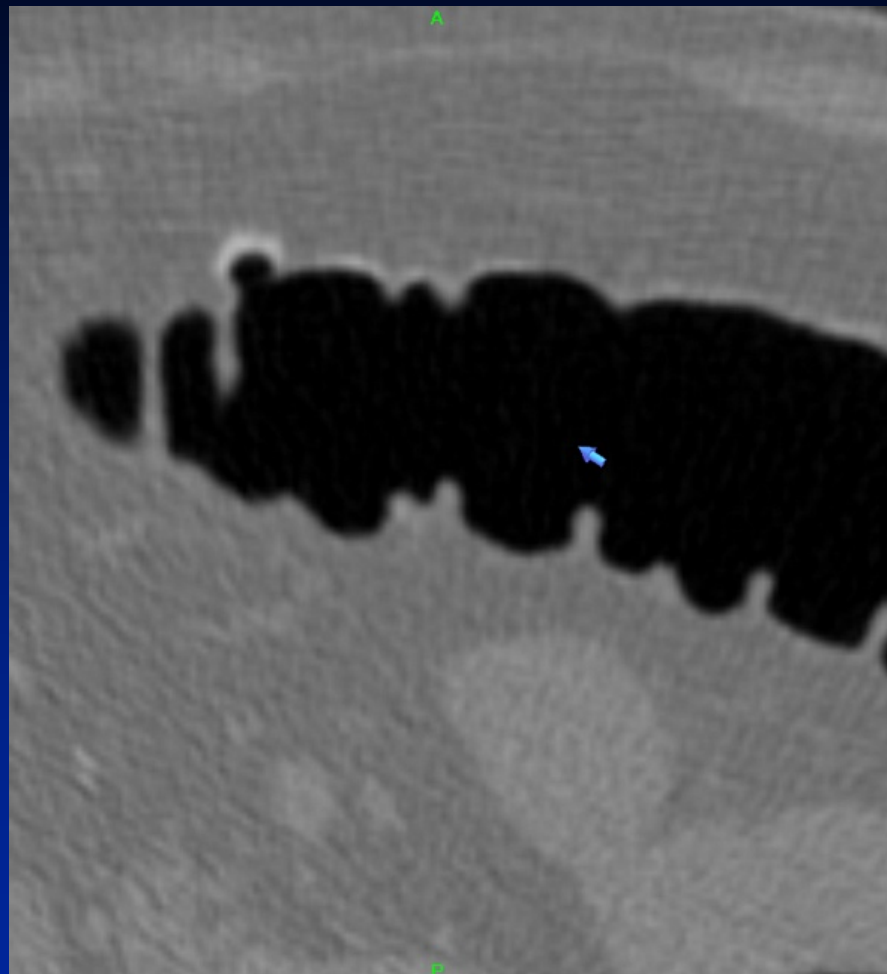
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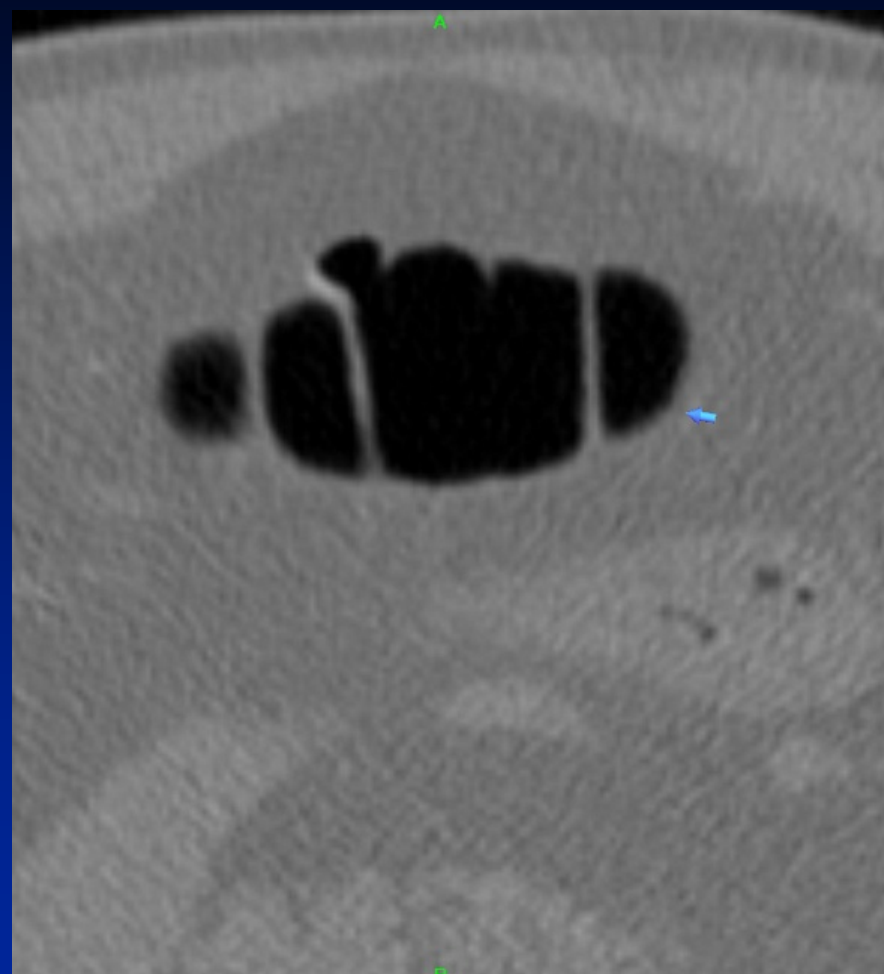
Supine



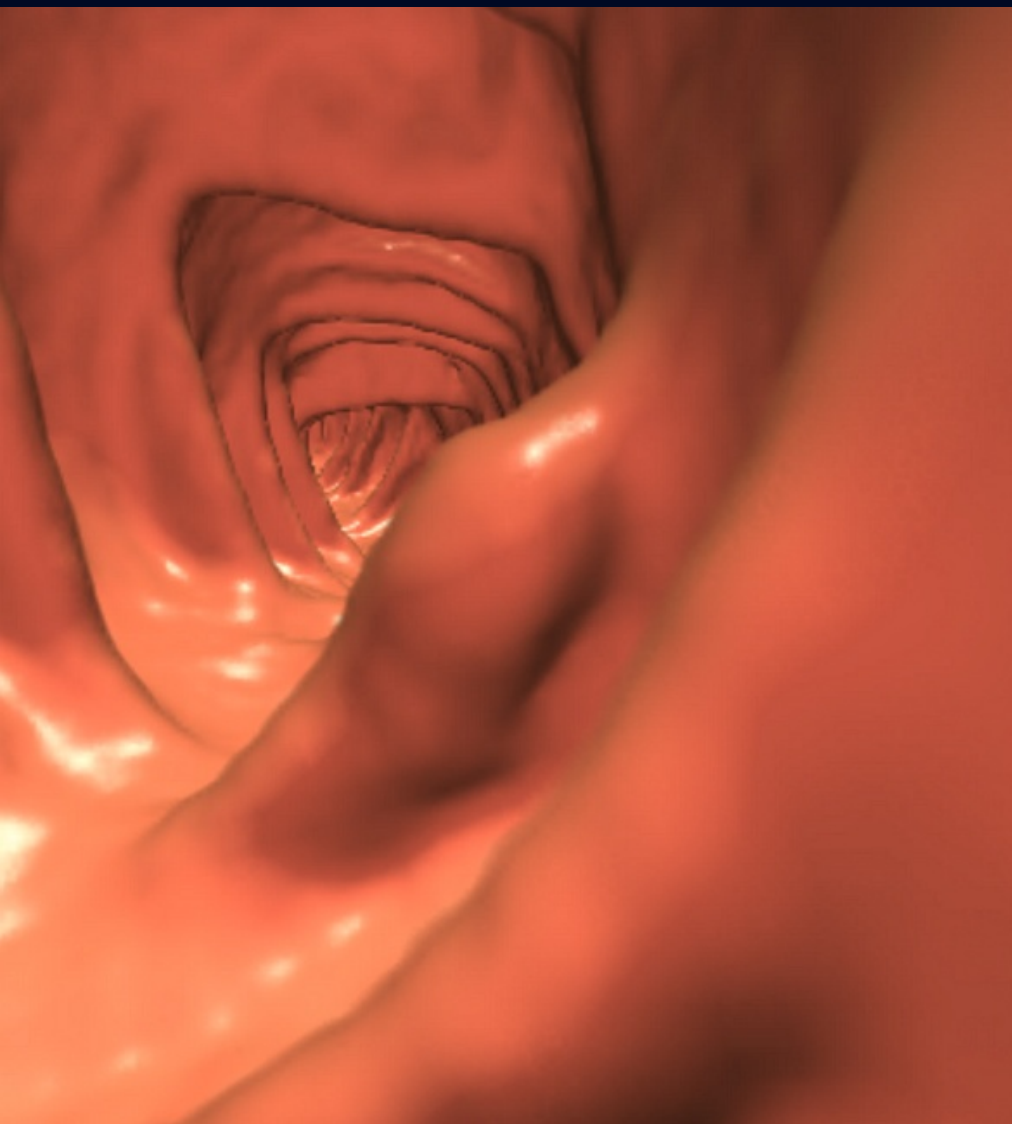
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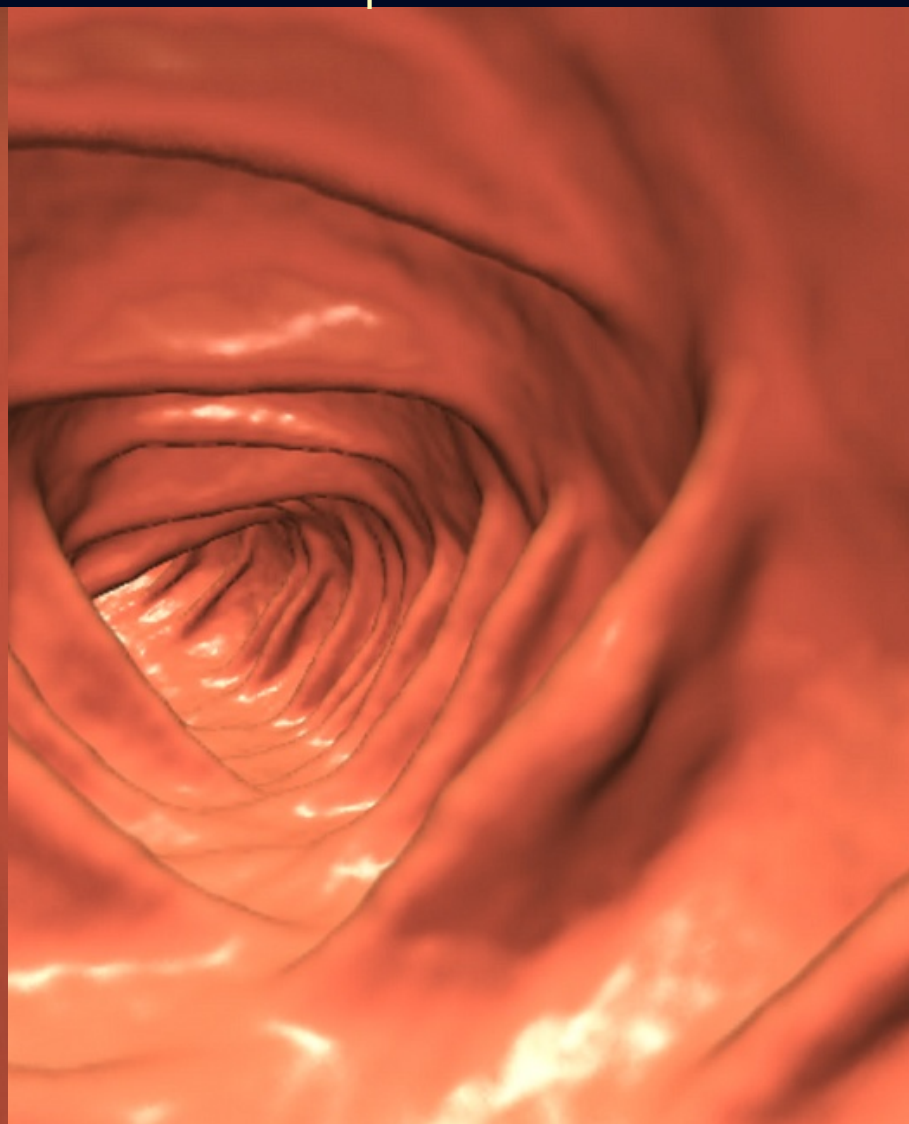
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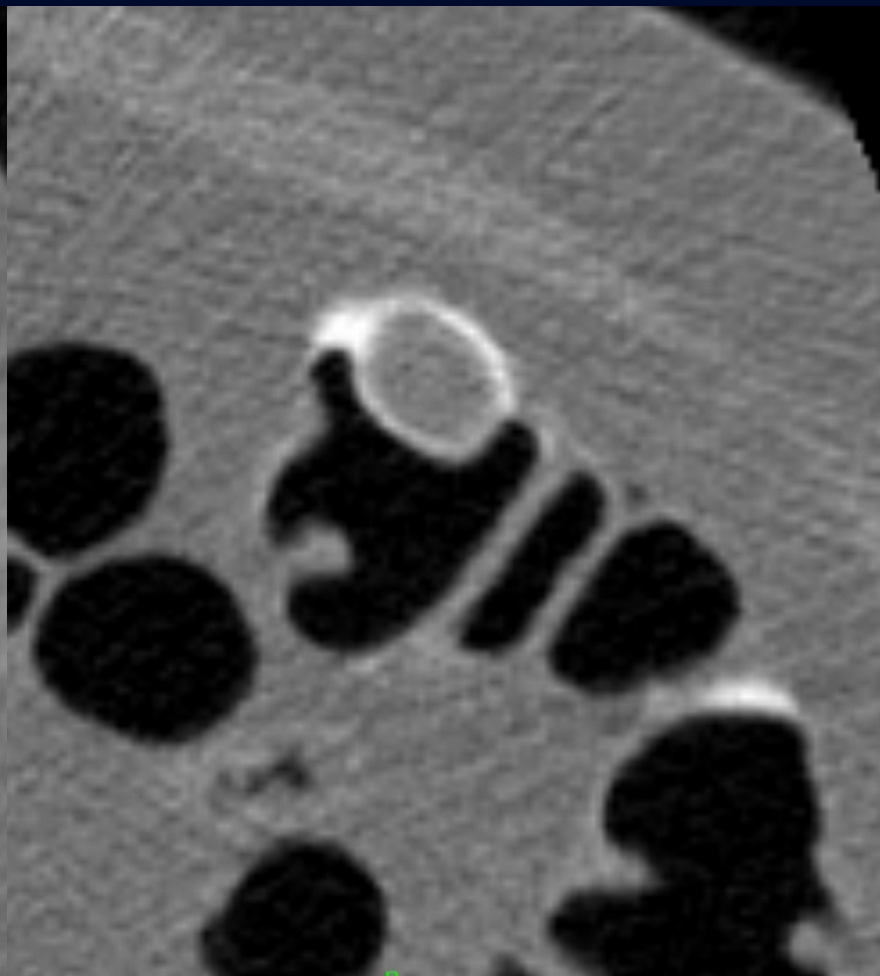
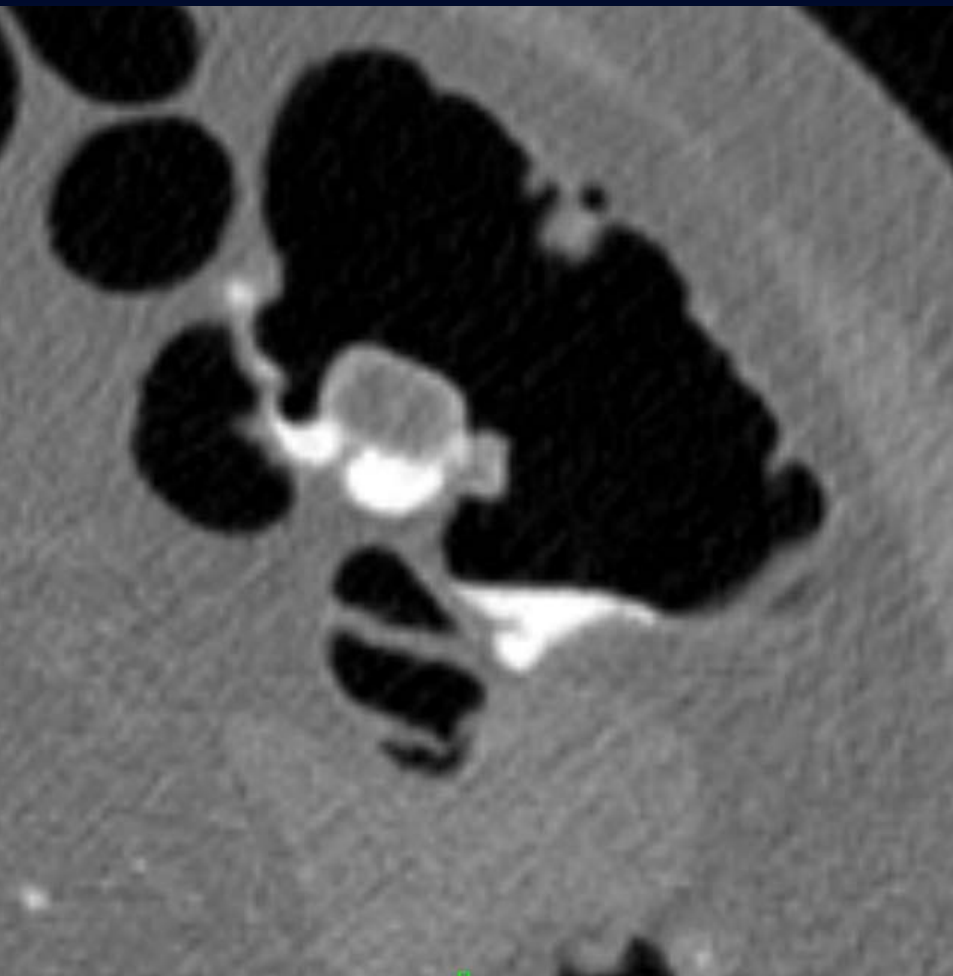


Supine



Supine

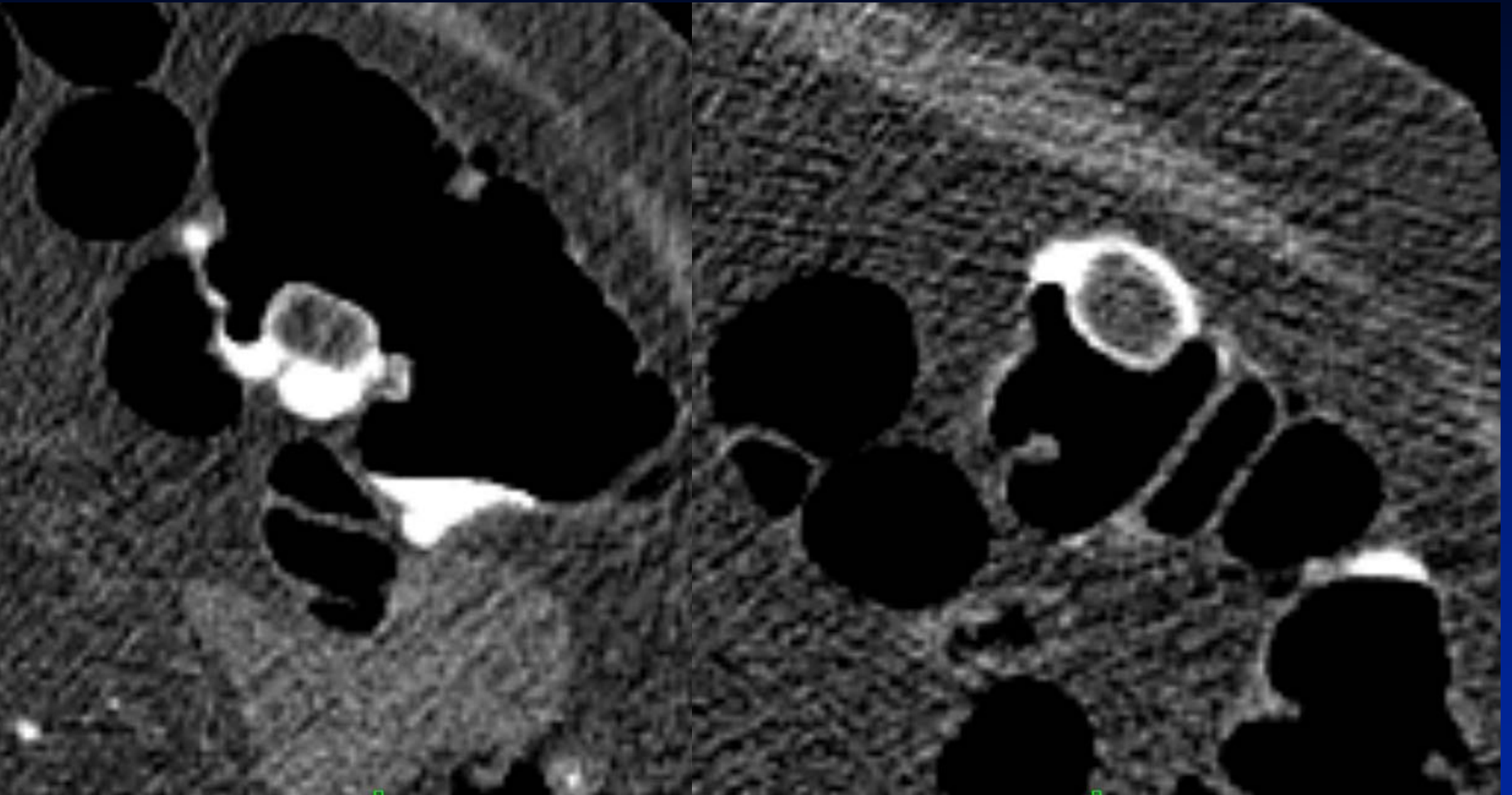
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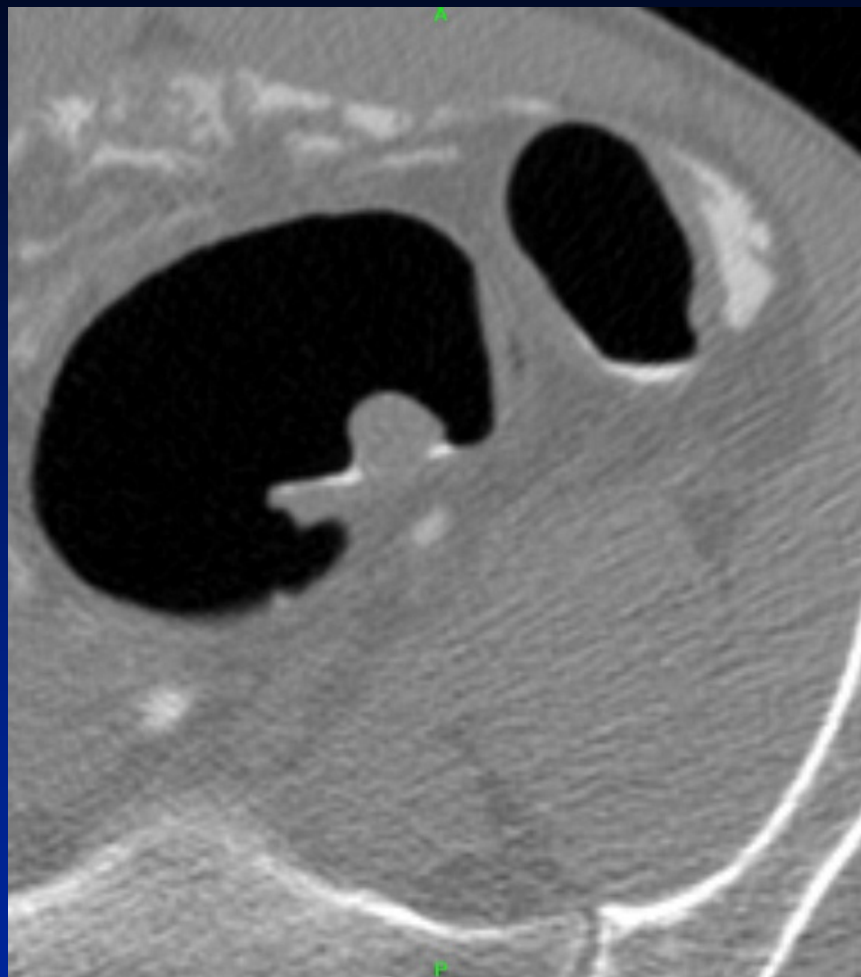
# Mobile Feces

Supine

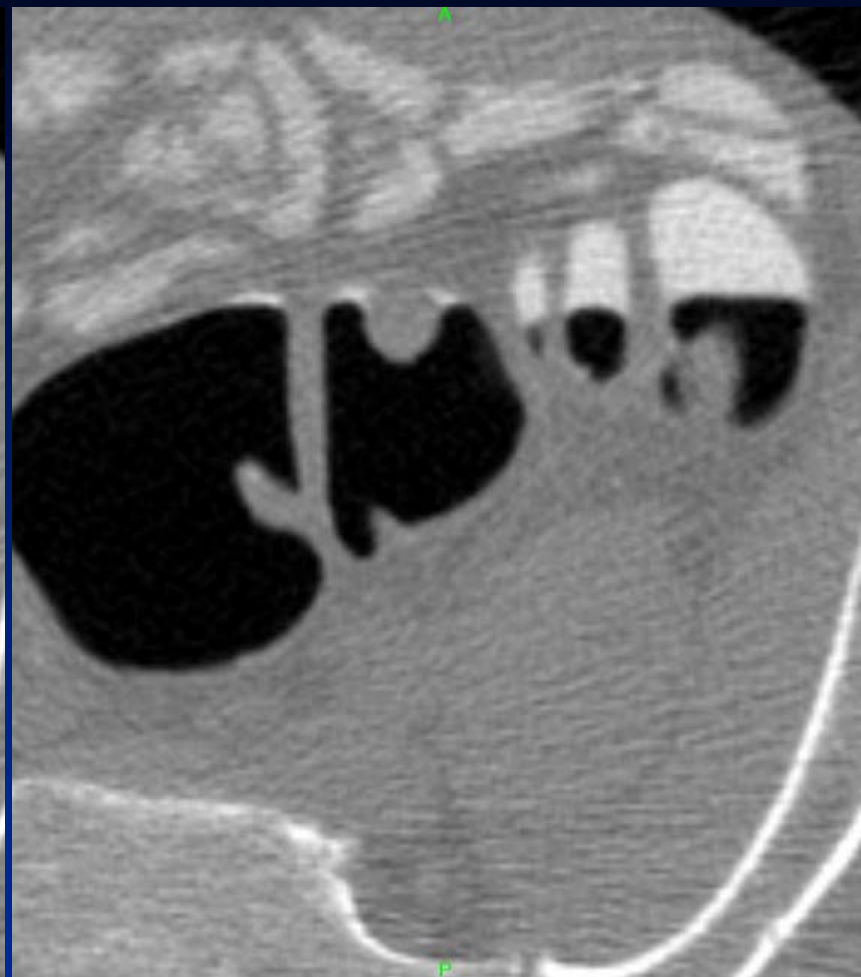
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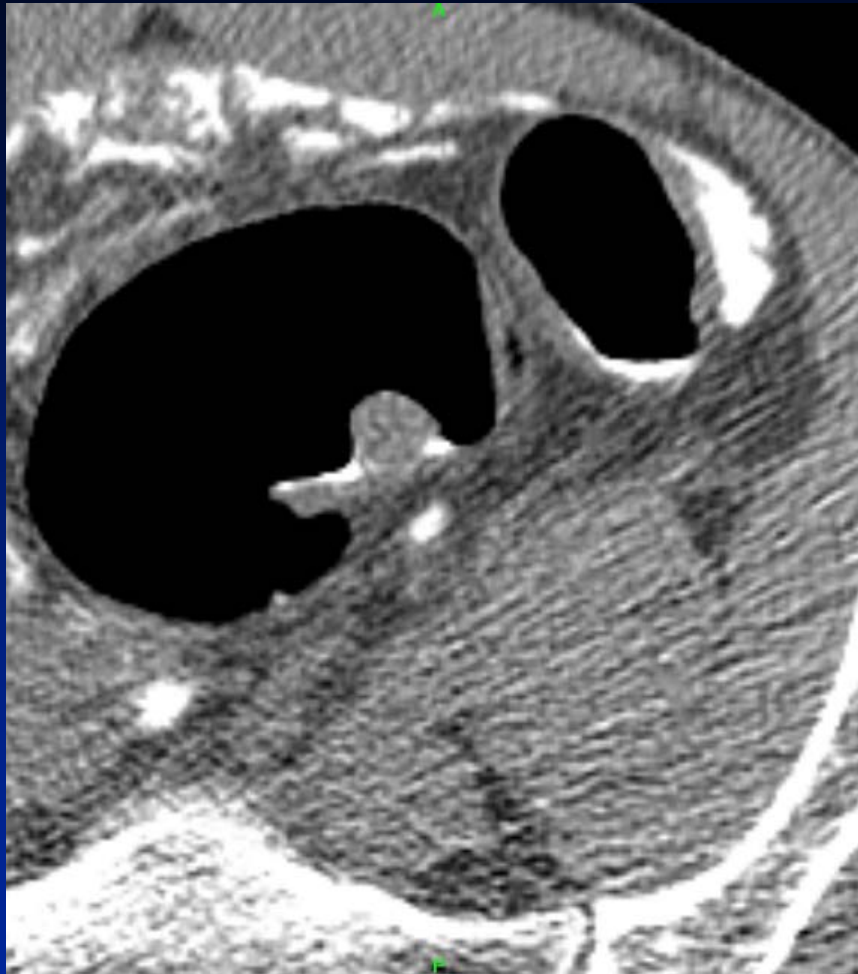
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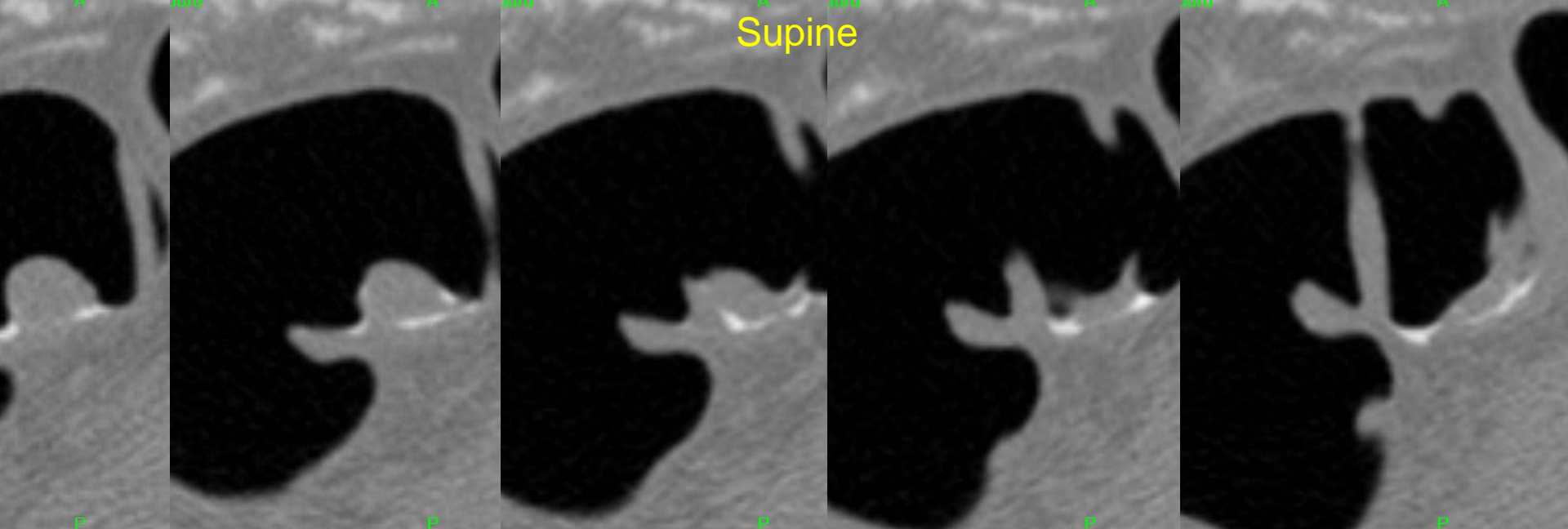
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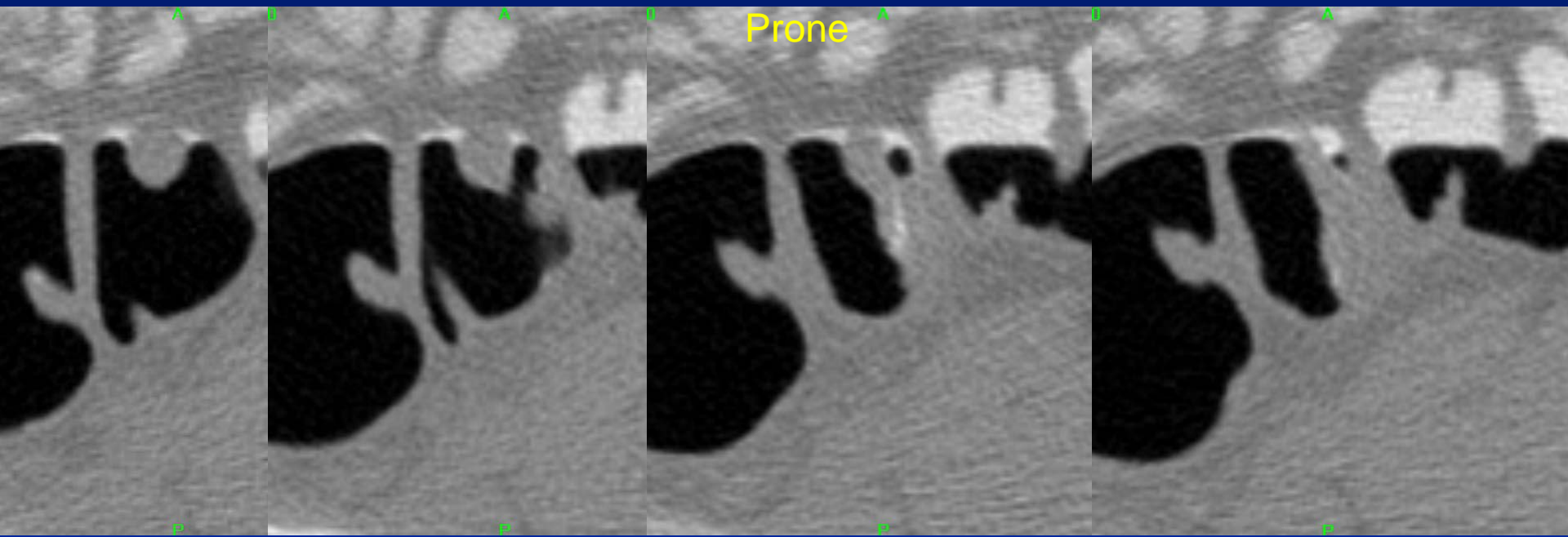
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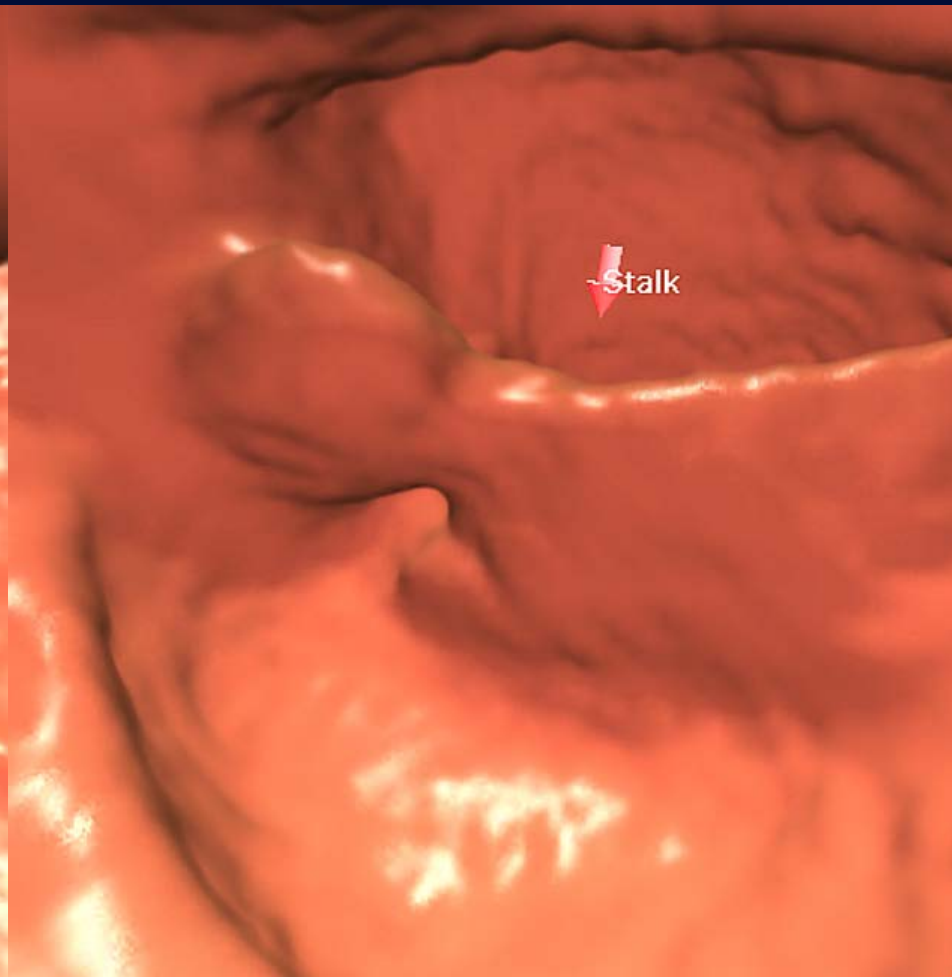
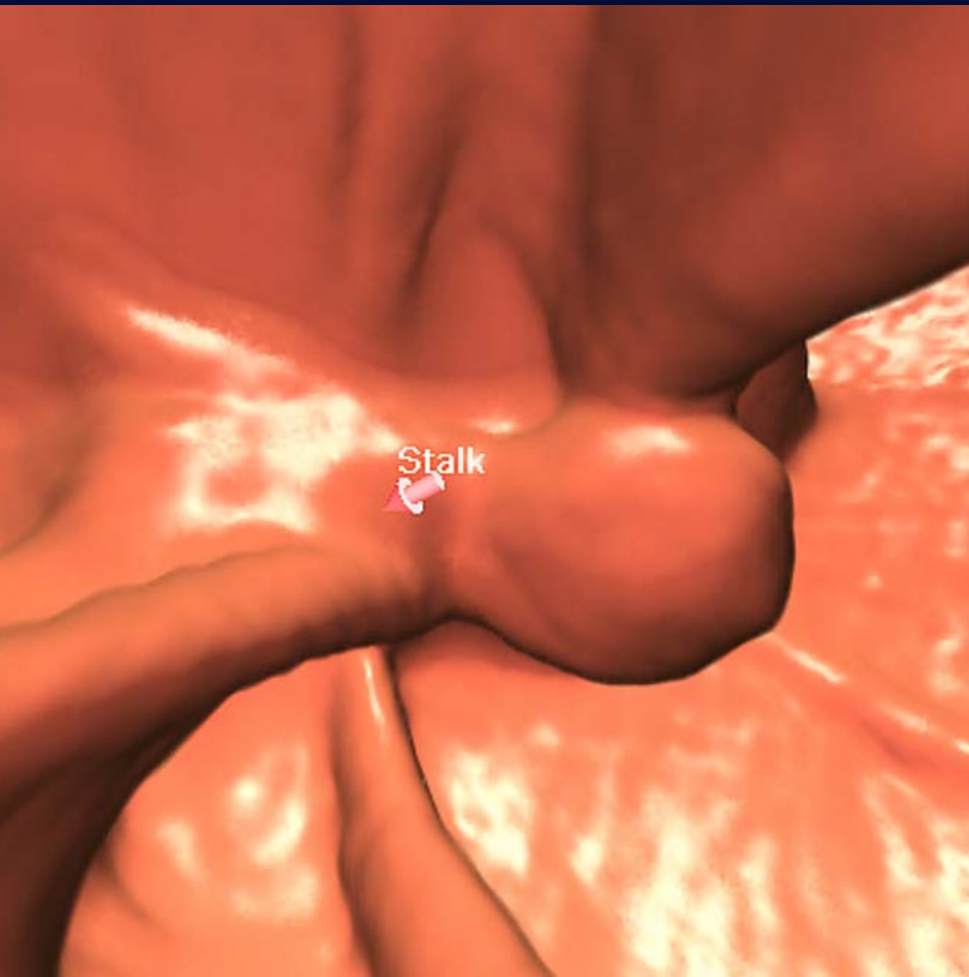


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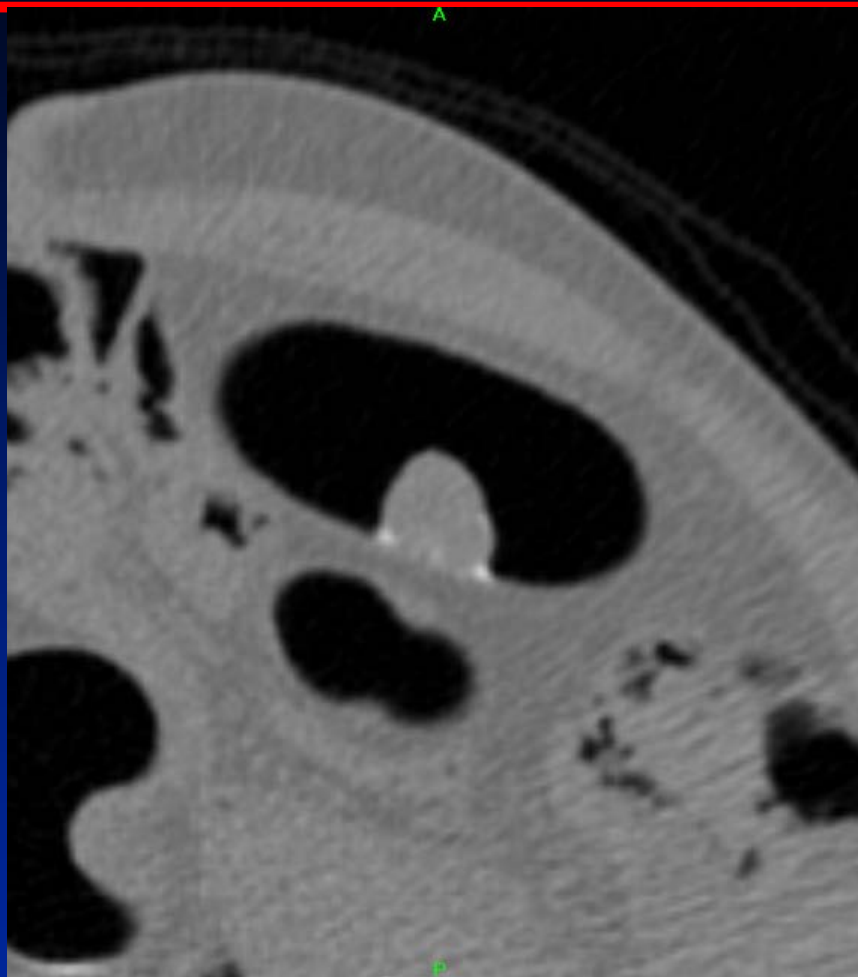


# Pedunculated Polyp

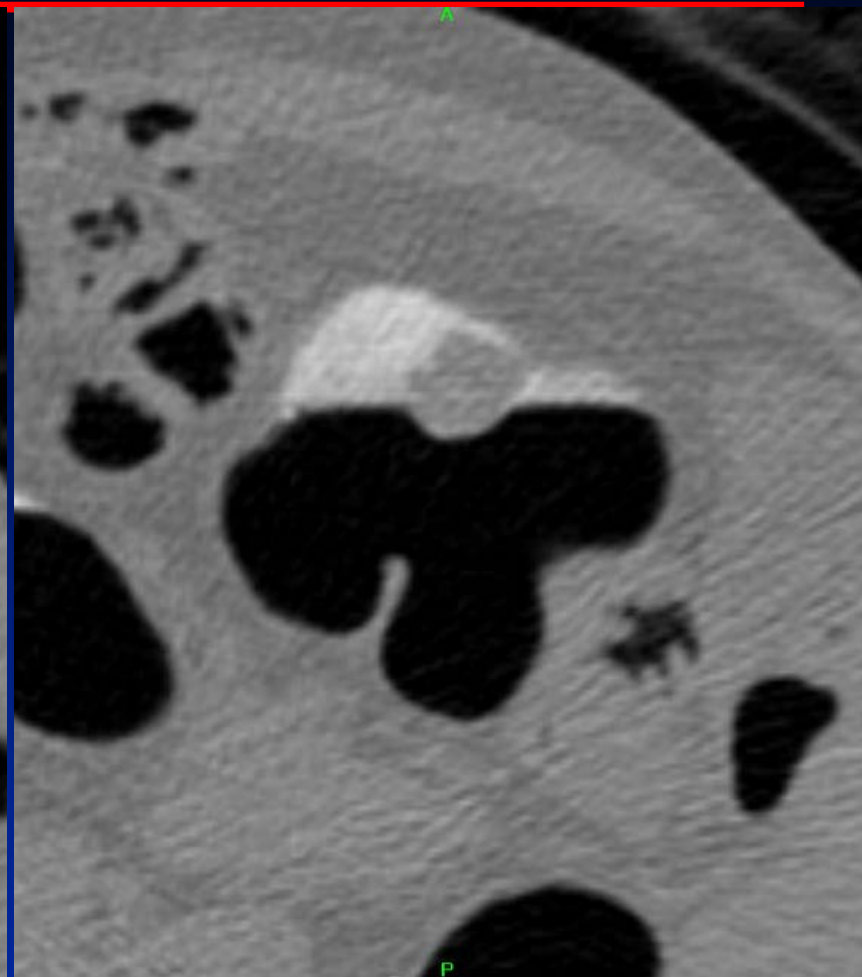
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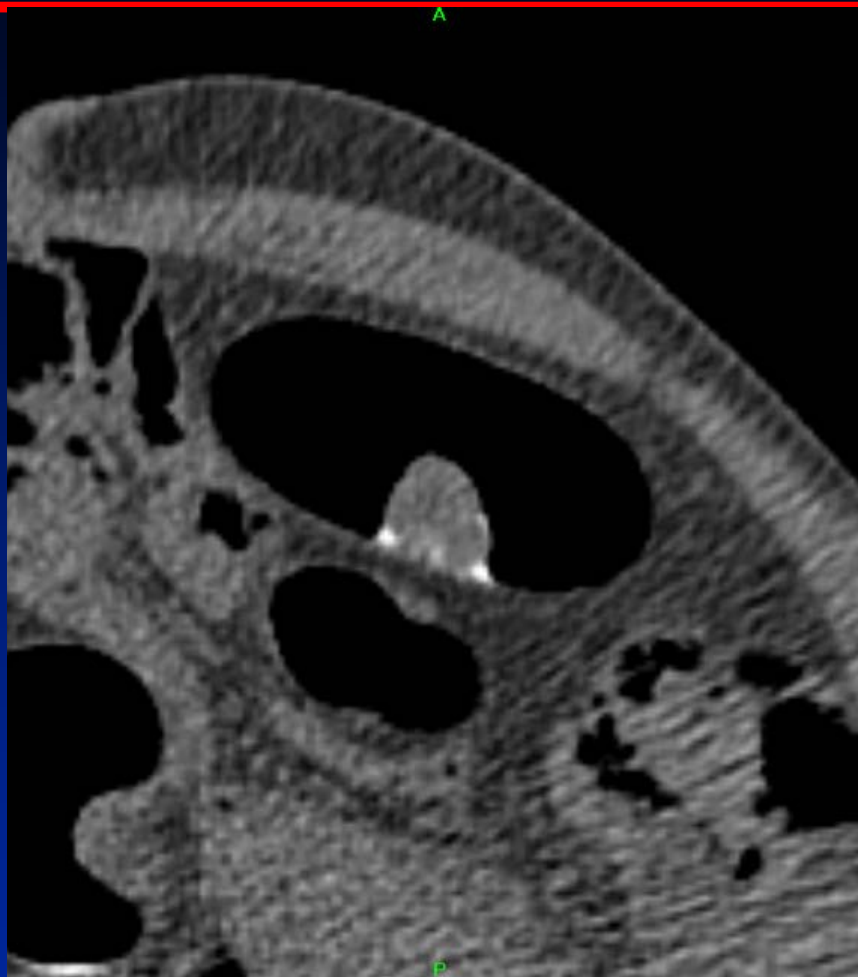
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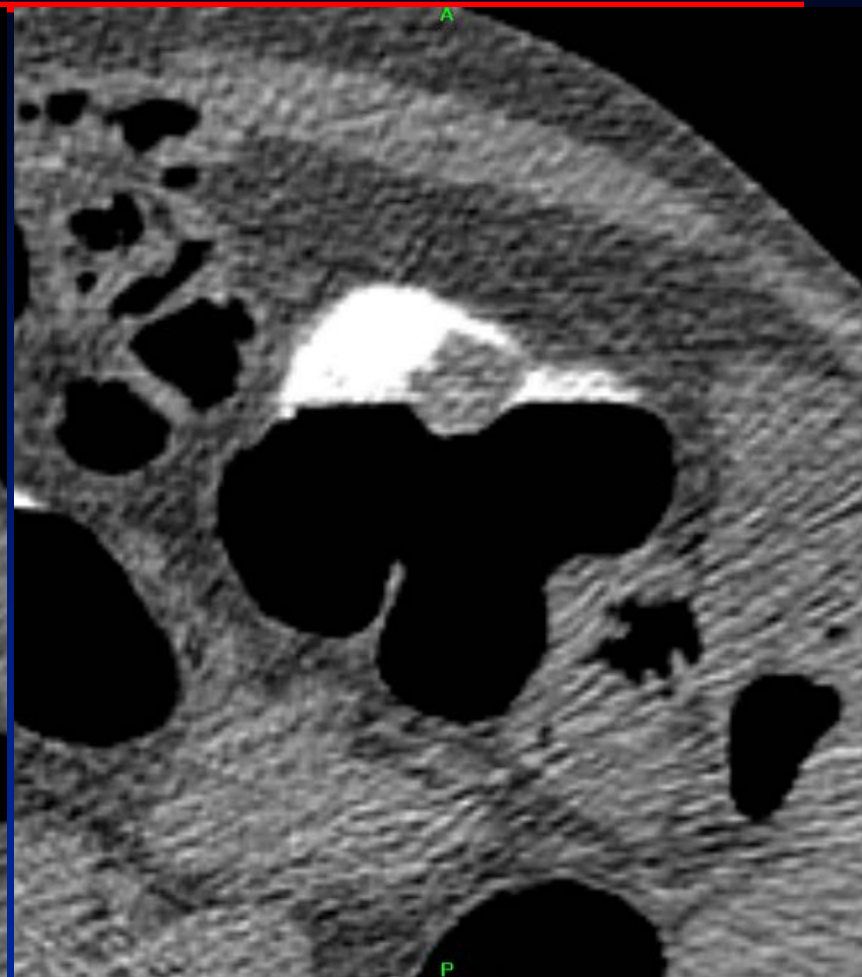
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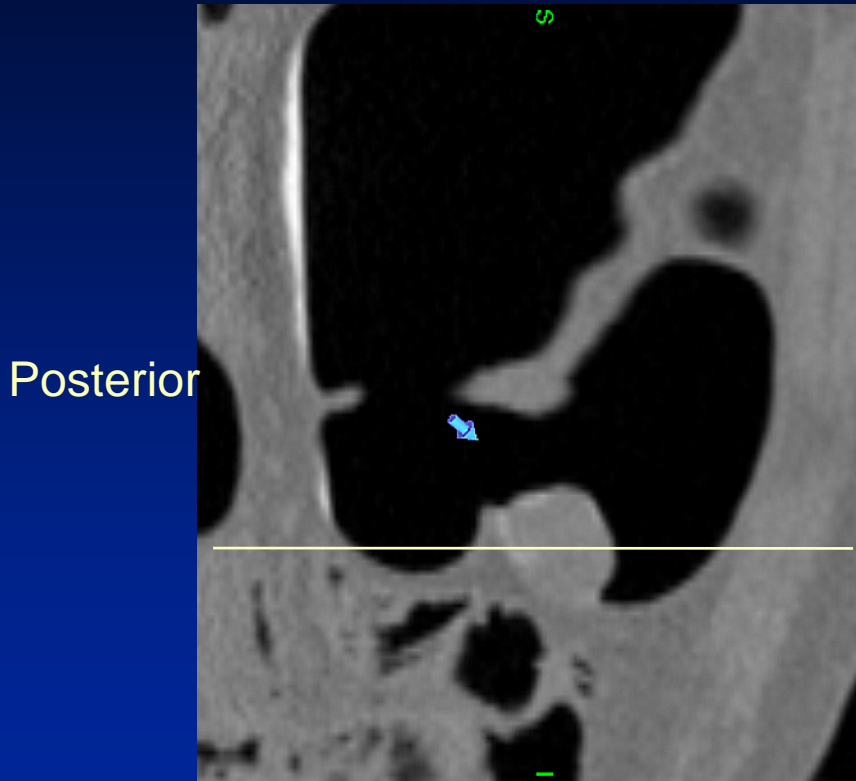
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# Colonic Mobility – Sagittal MPR Often Helpful!

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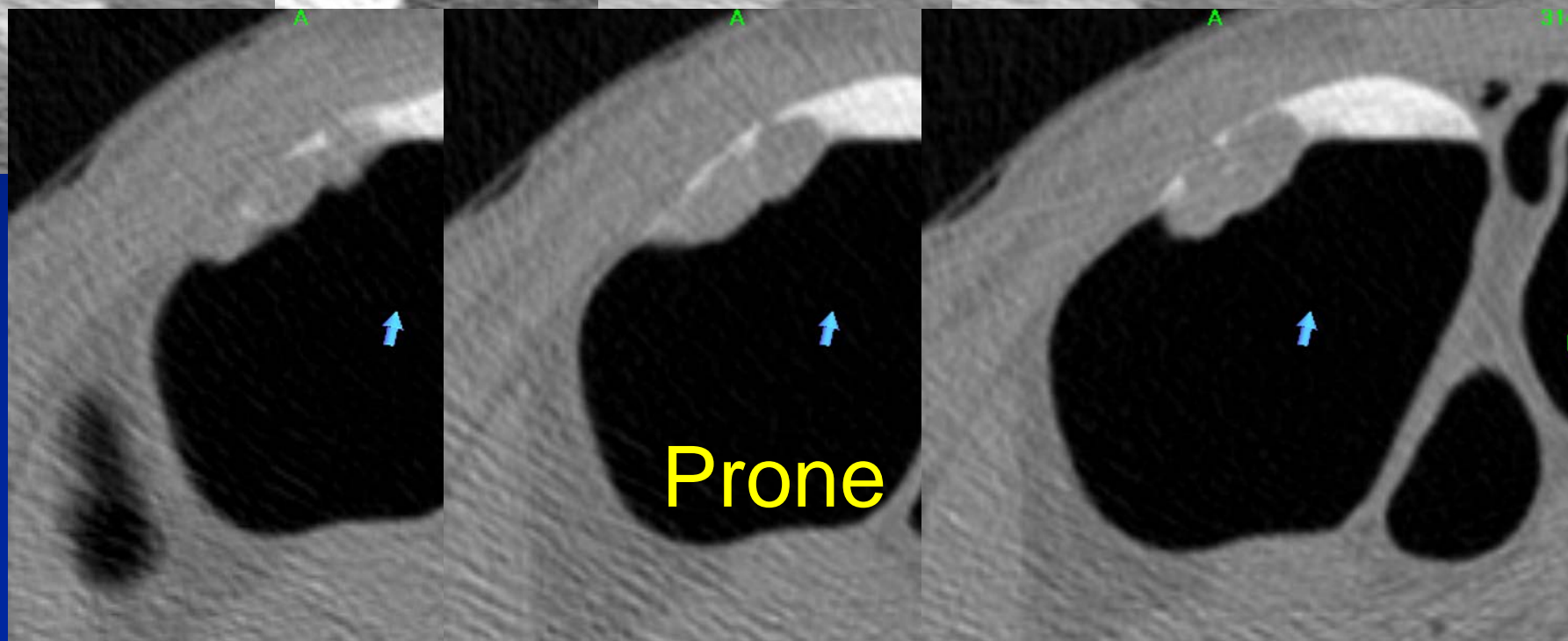
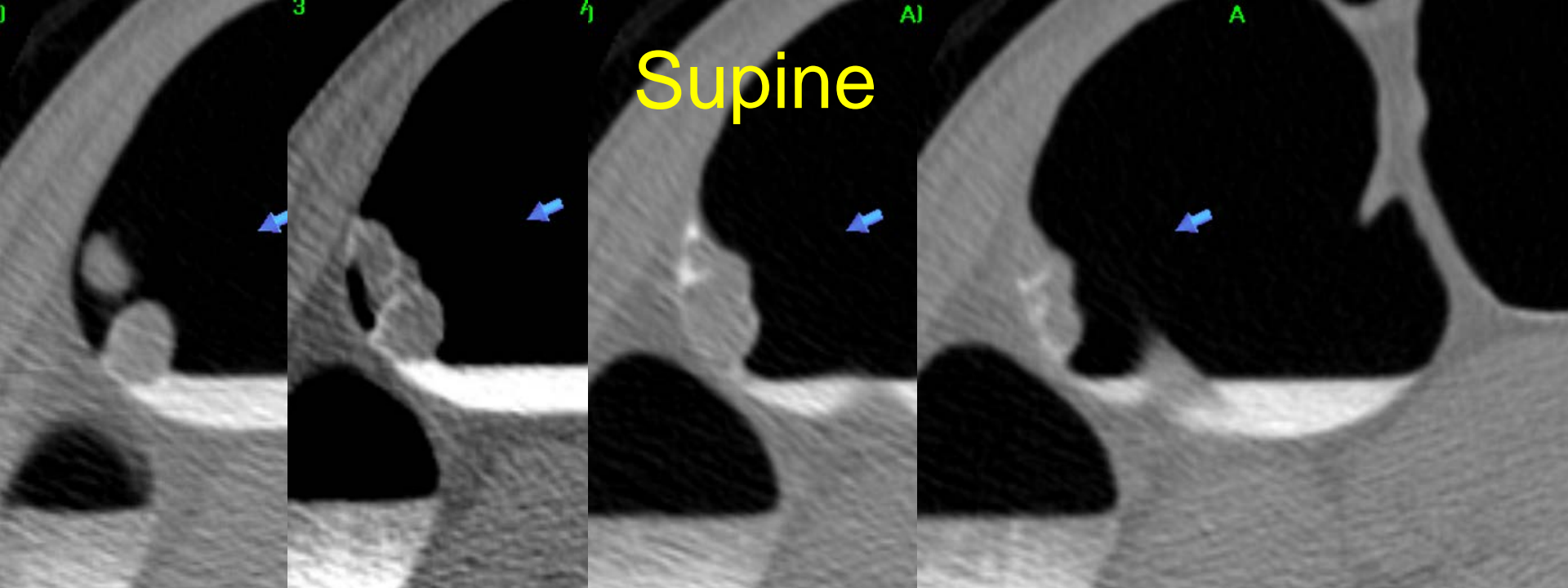
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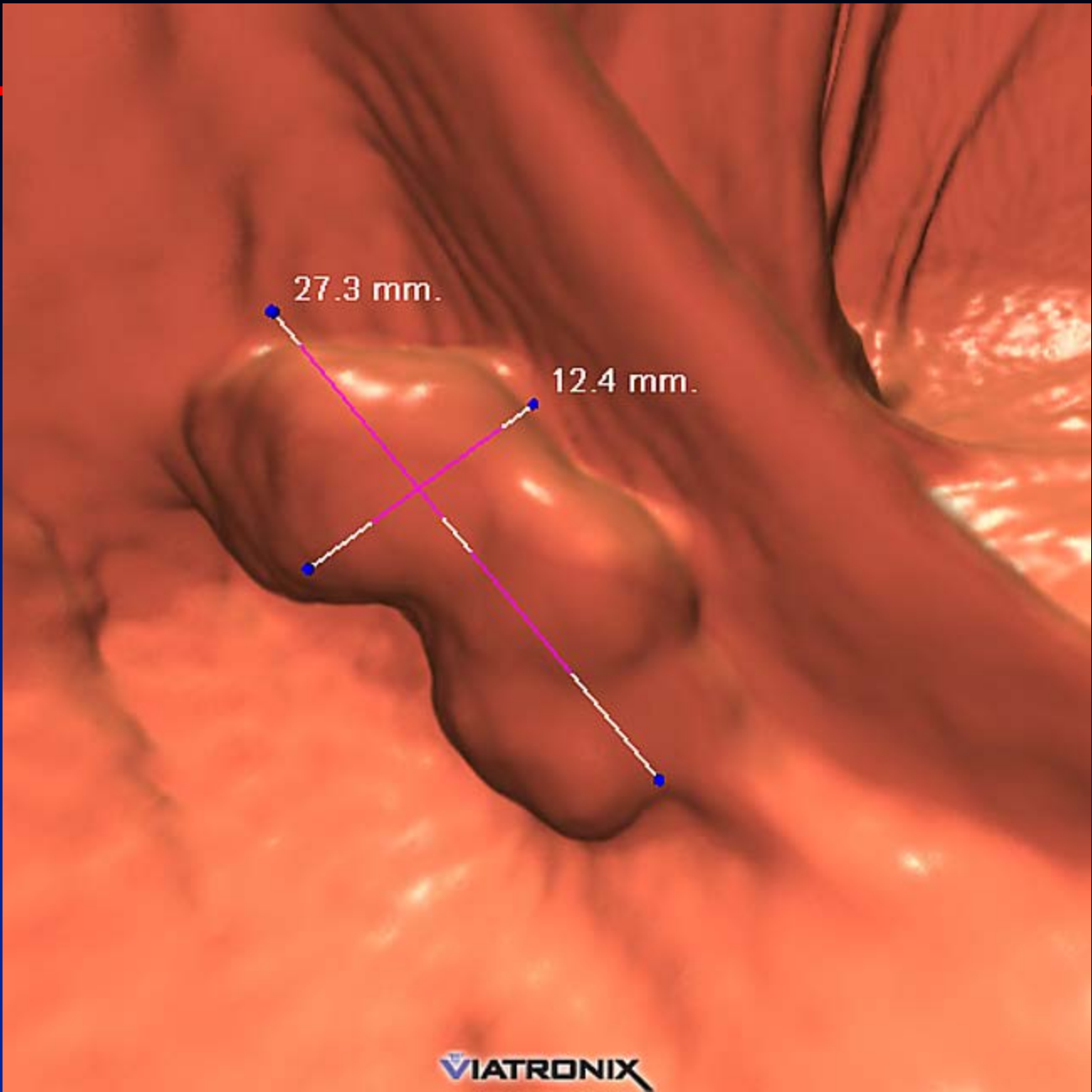


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Inferior



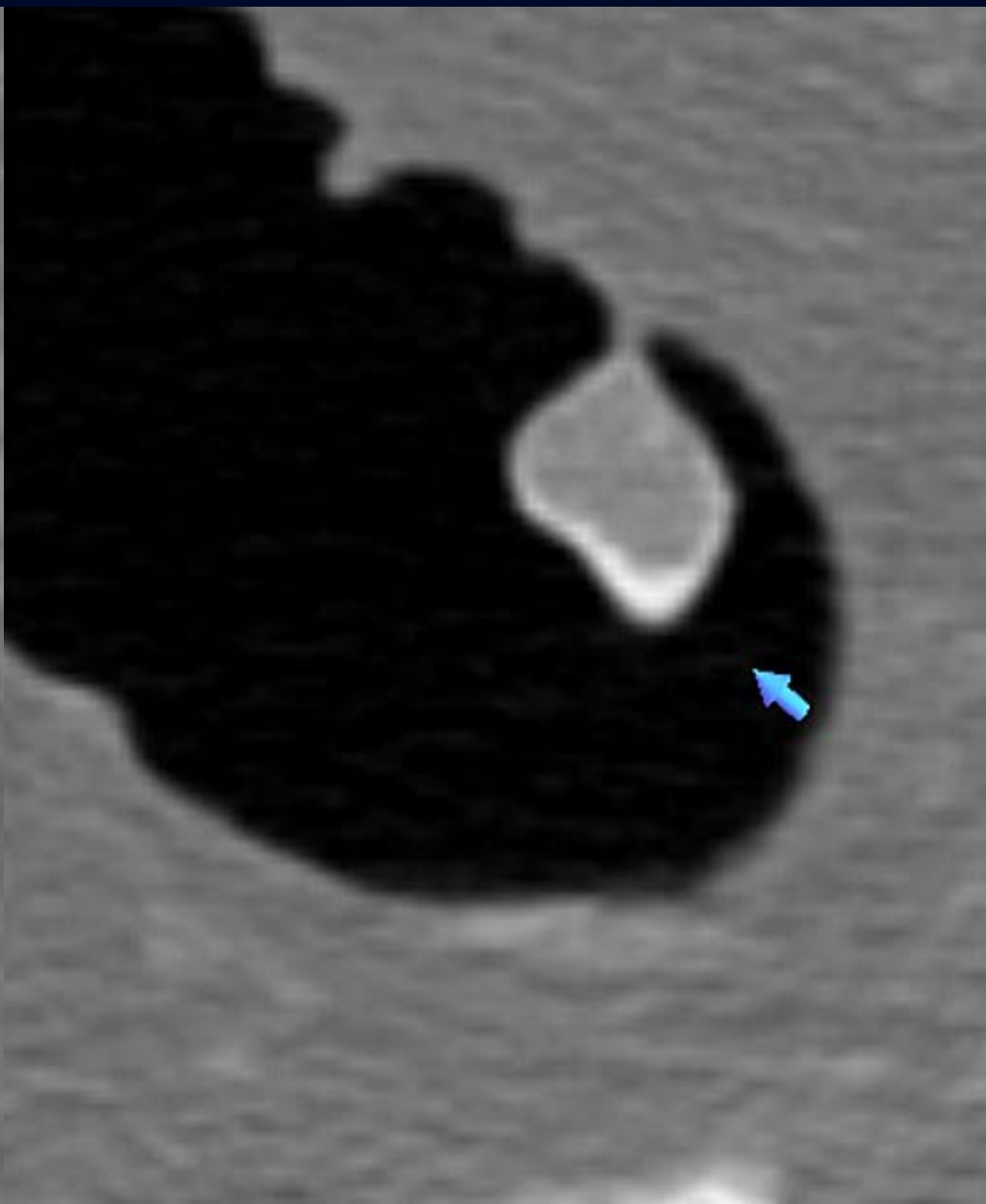
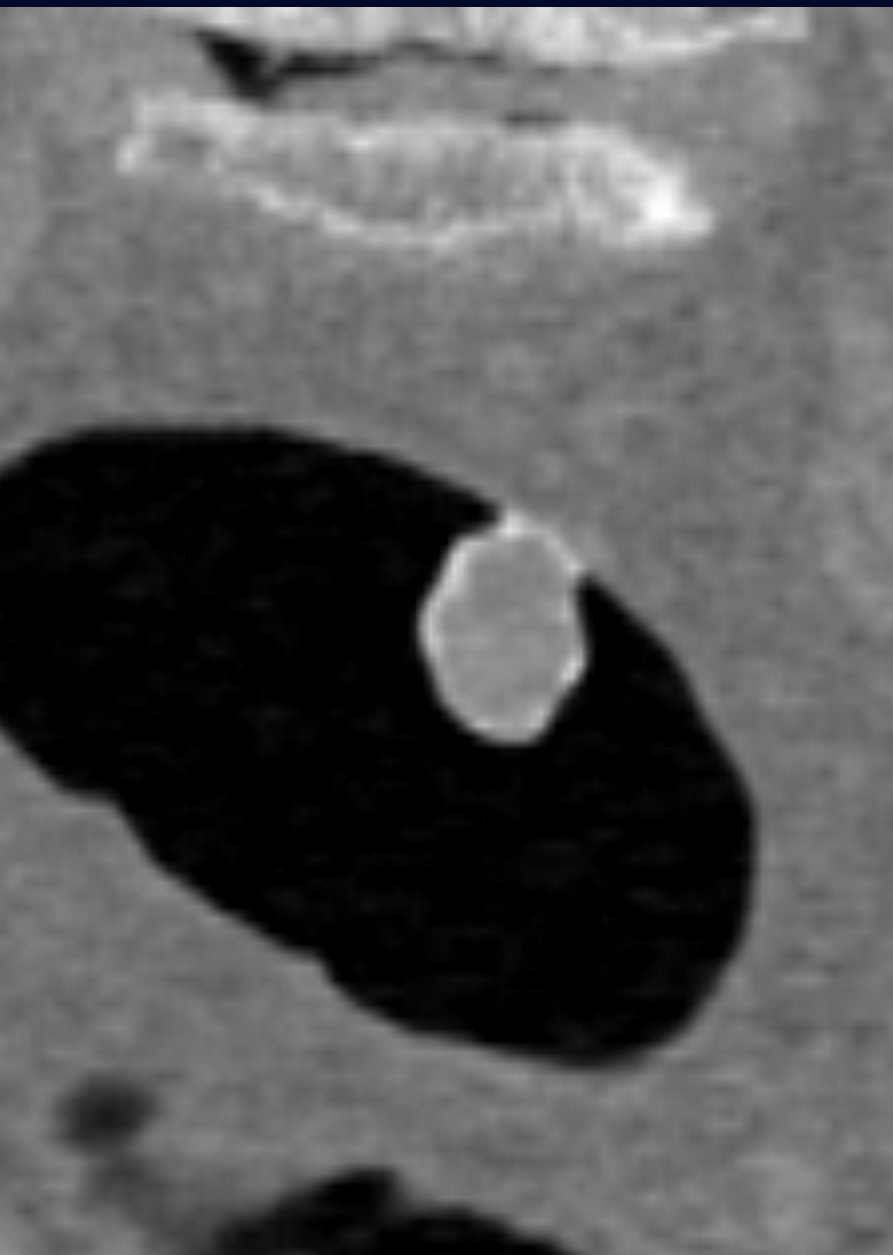


27.3 mm.

12.4 mm.

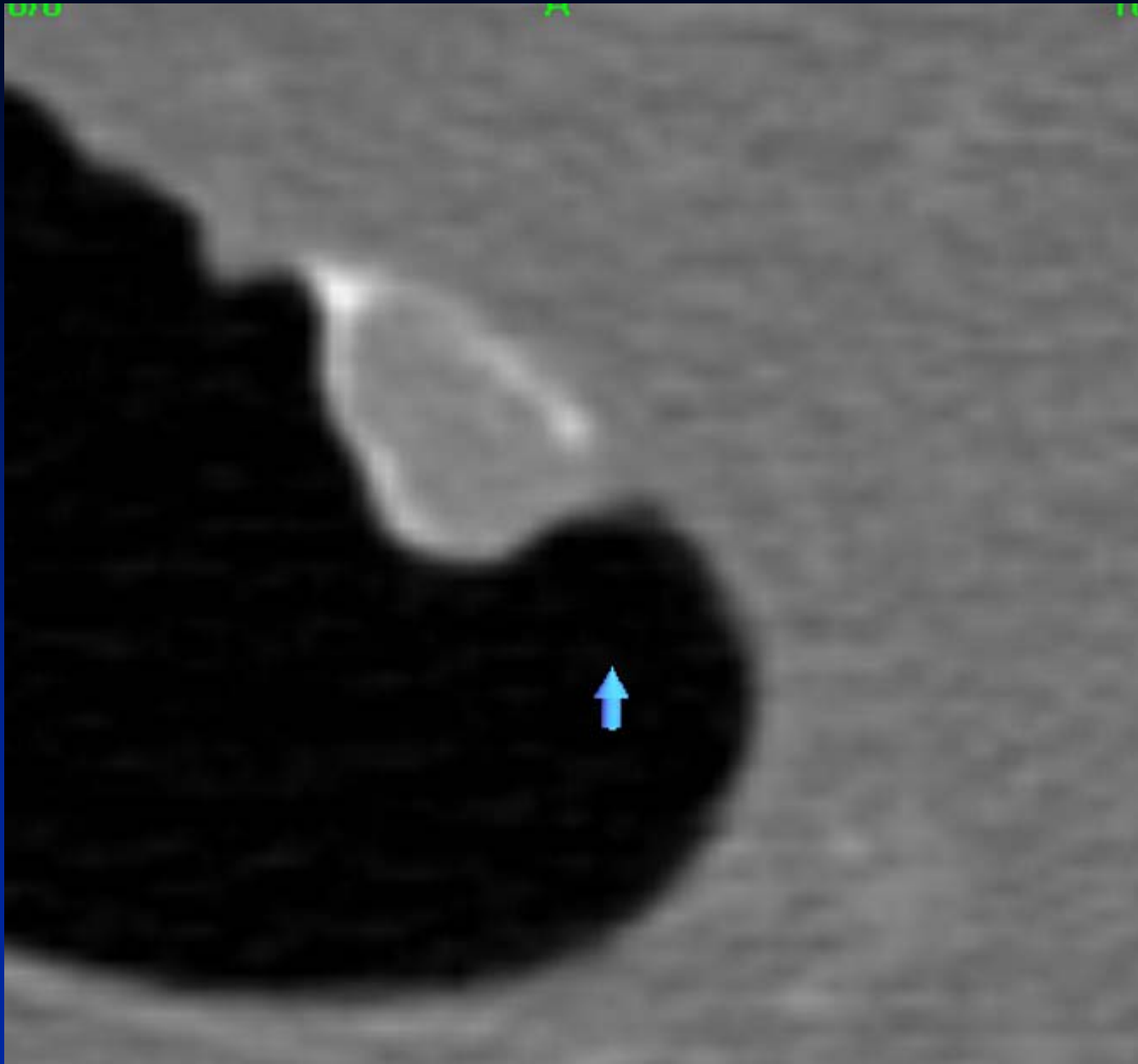
# Supine

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# Prone

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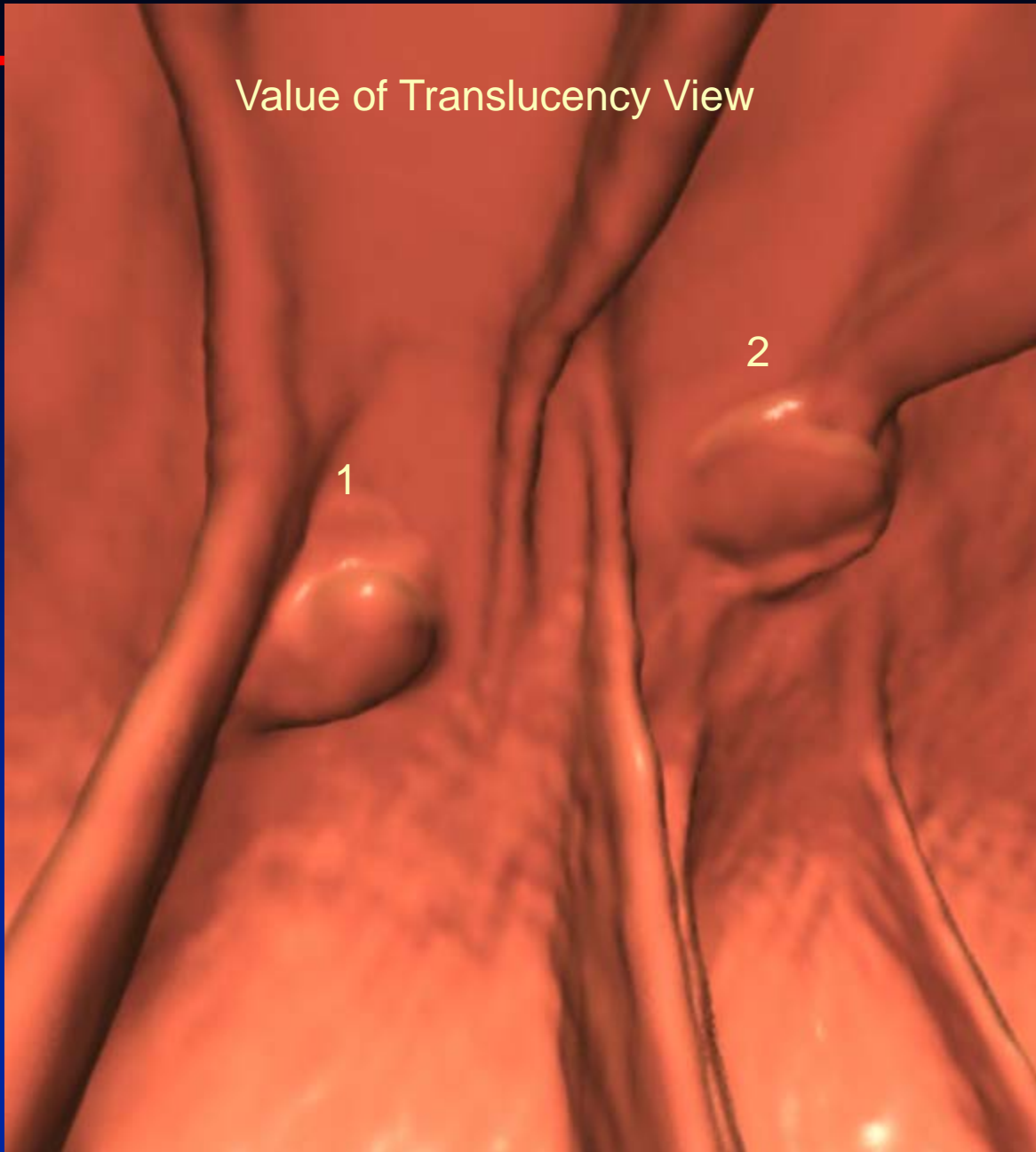


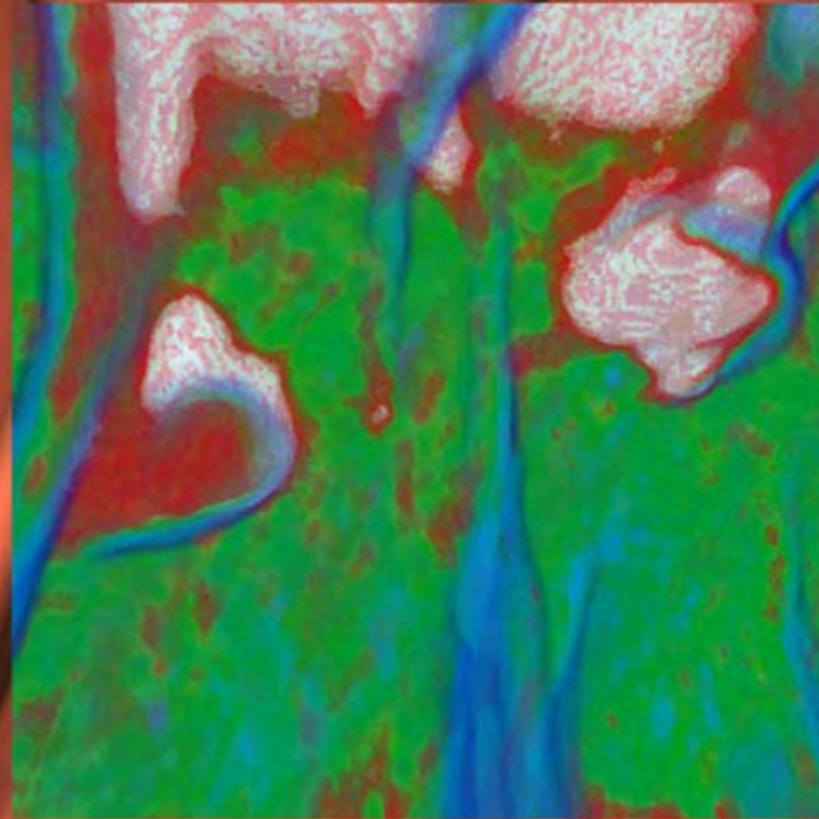
## 3-D Review – False Positives

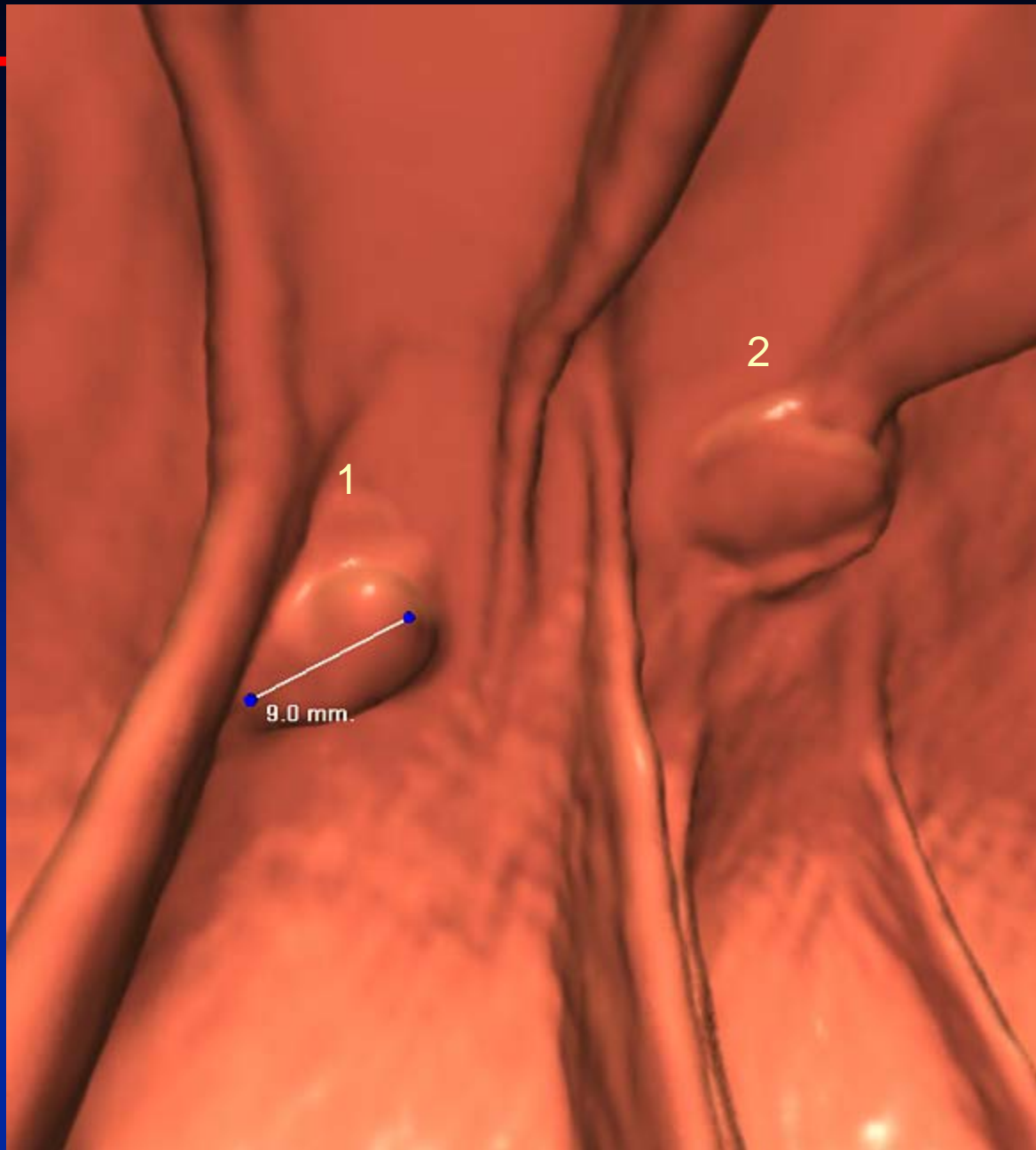
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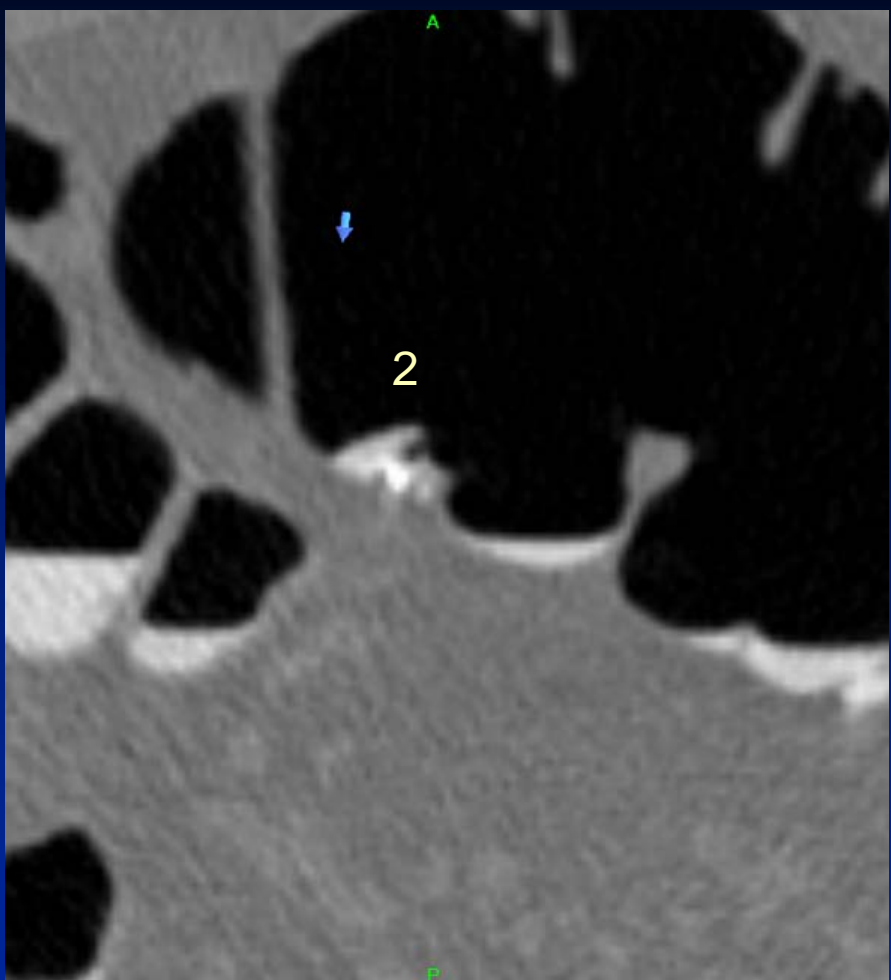
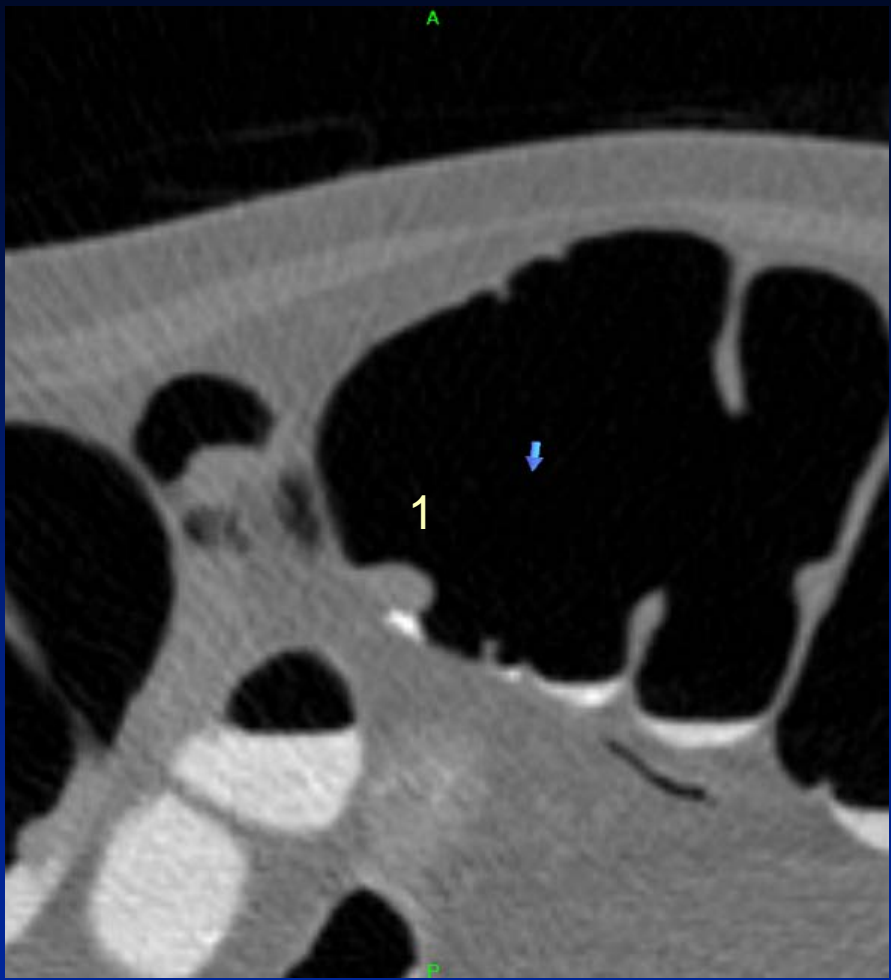
- ◆ Polypoid stool
  - Translucency view may be helpful but be careful!
- ◆ Impacted or inverted diverticuli
- ◆ Inverted appendiceal stump
- ◆ Extrinsic compression

## Value of Translucency View



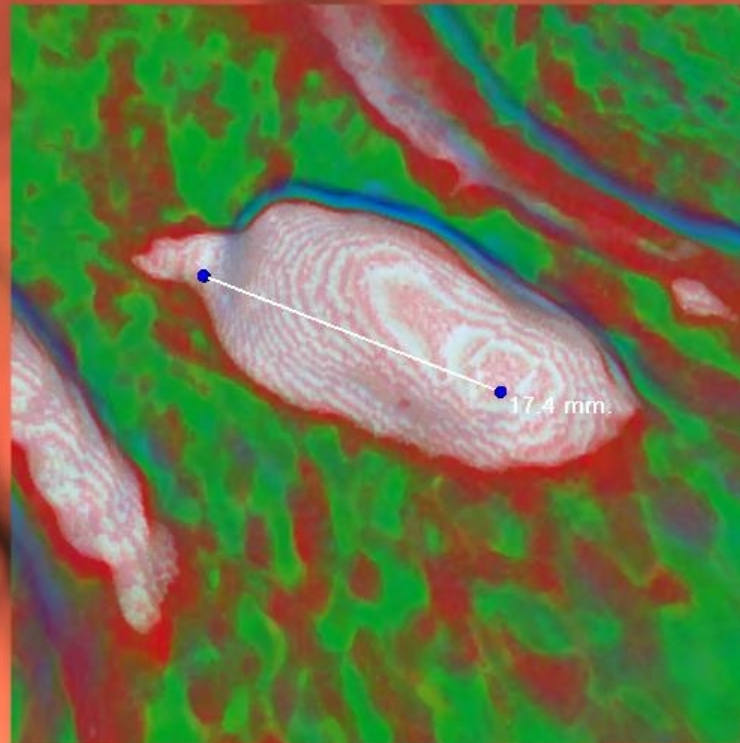


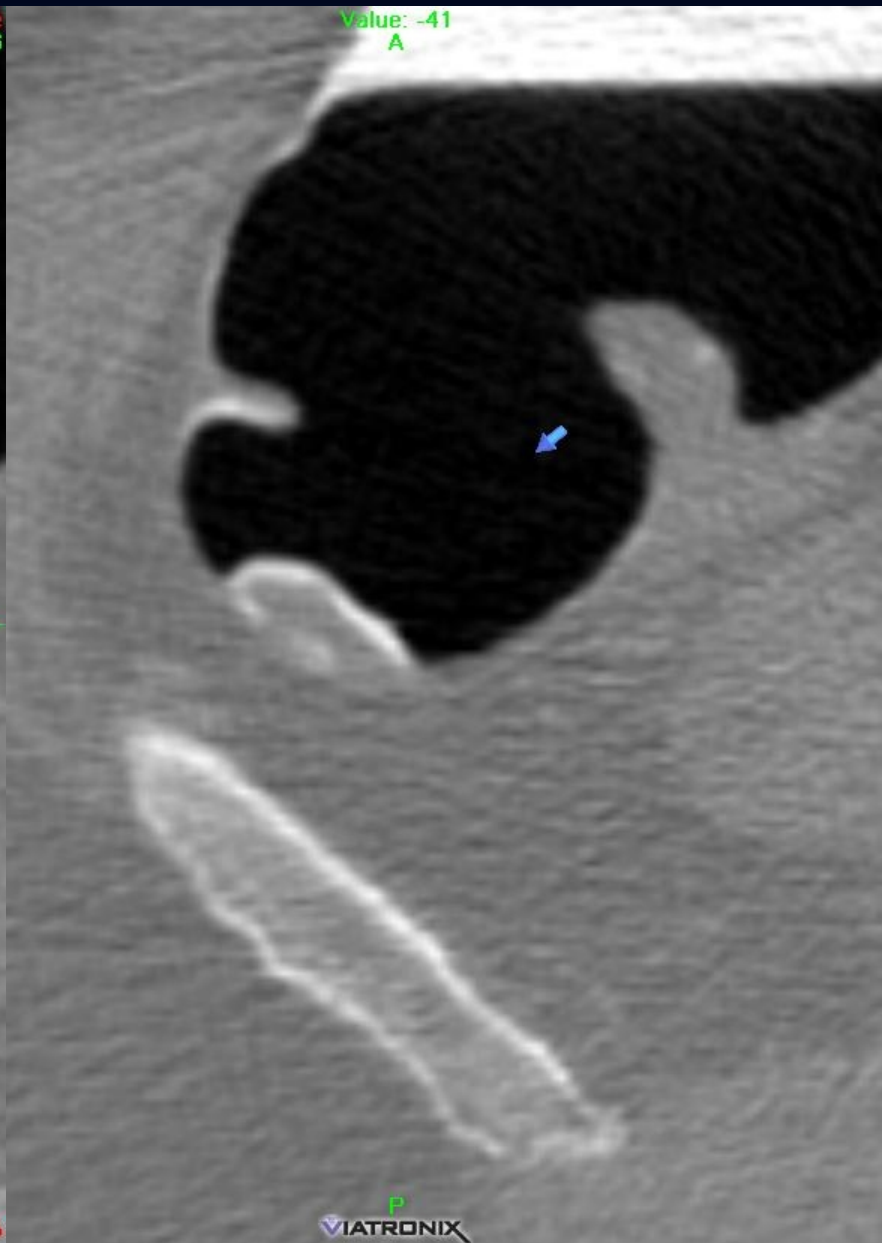
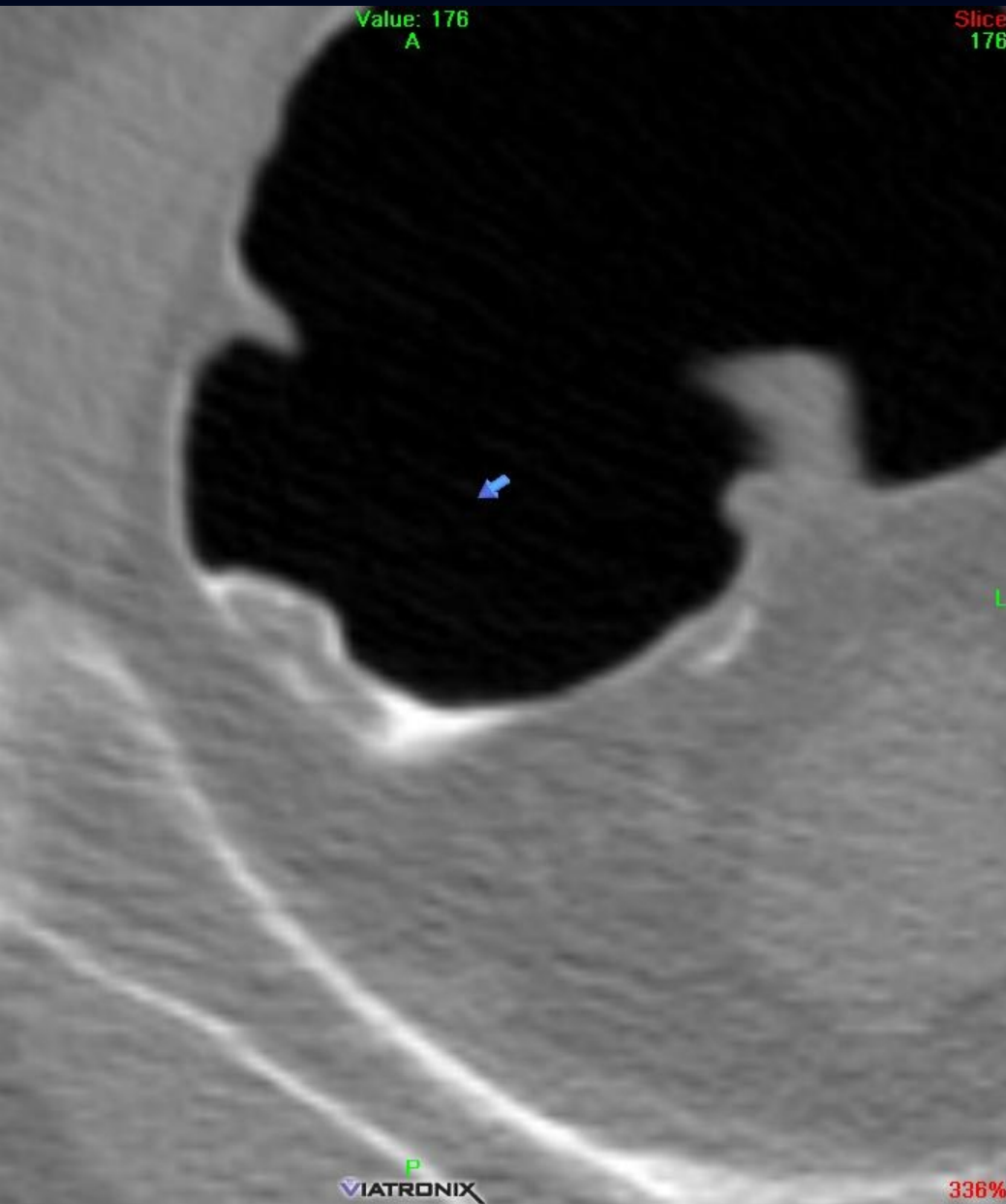


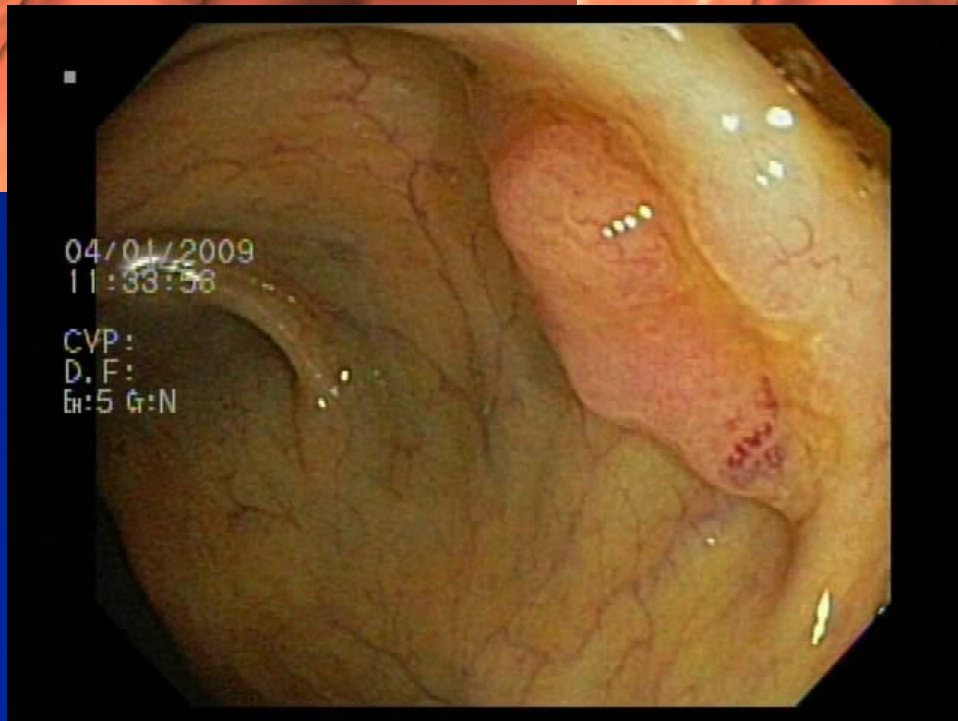
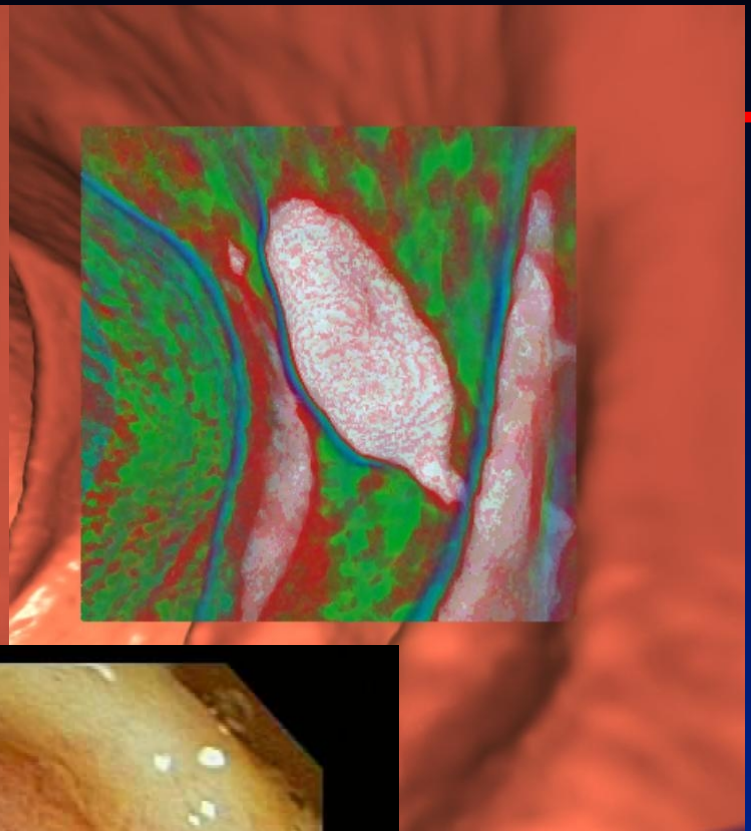
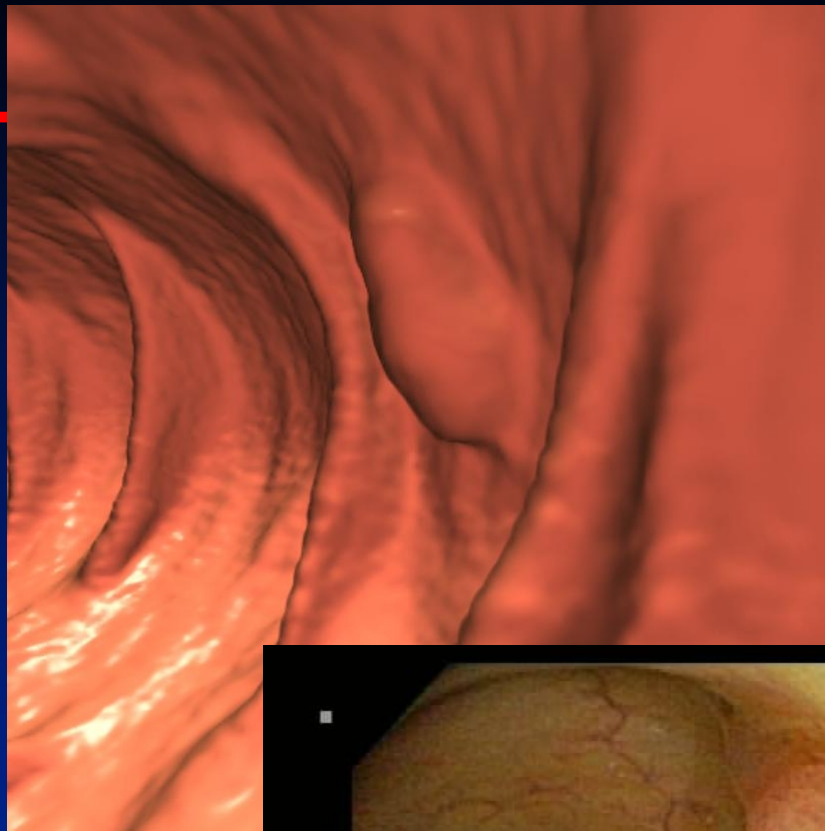


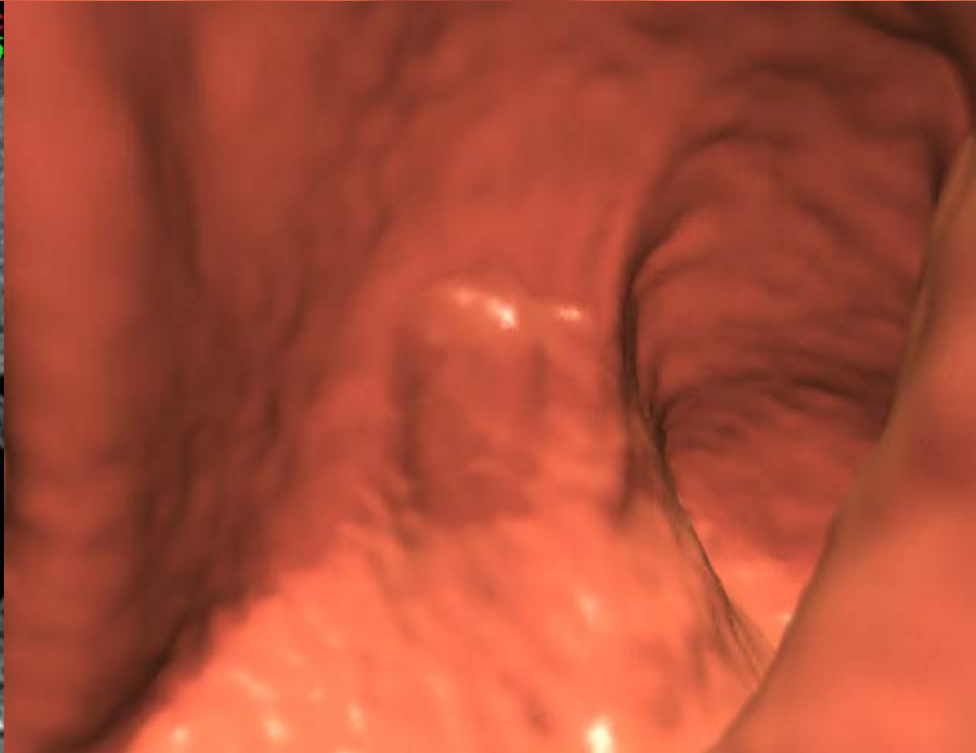
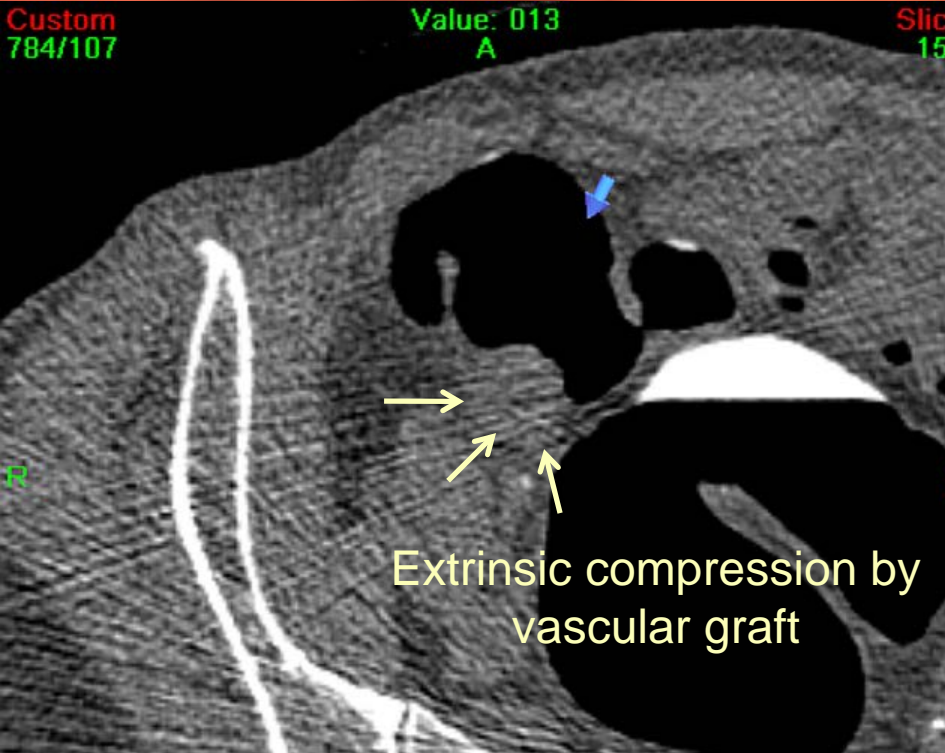
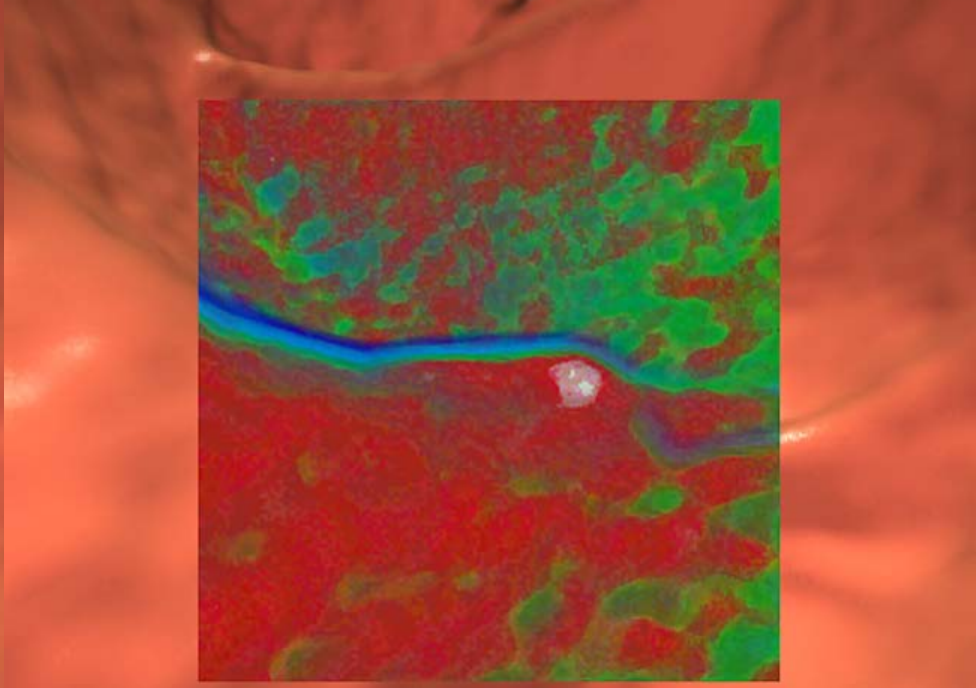
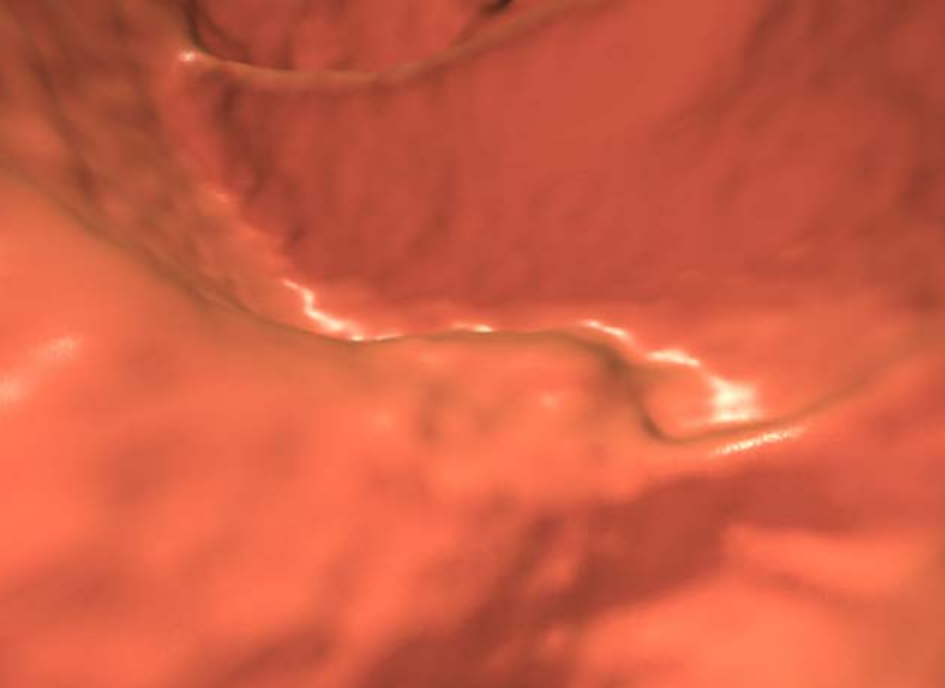
# Perils of Translucency View

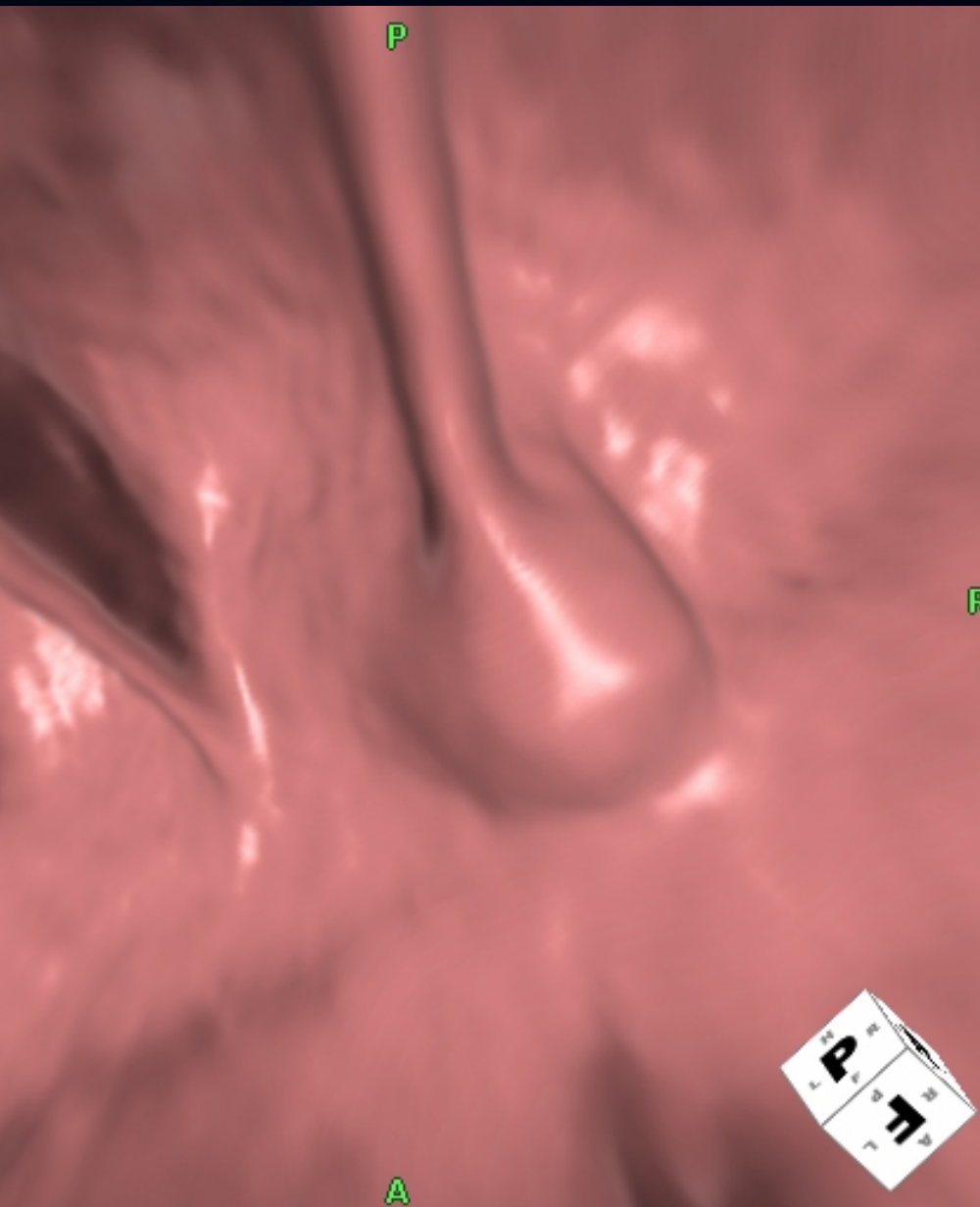
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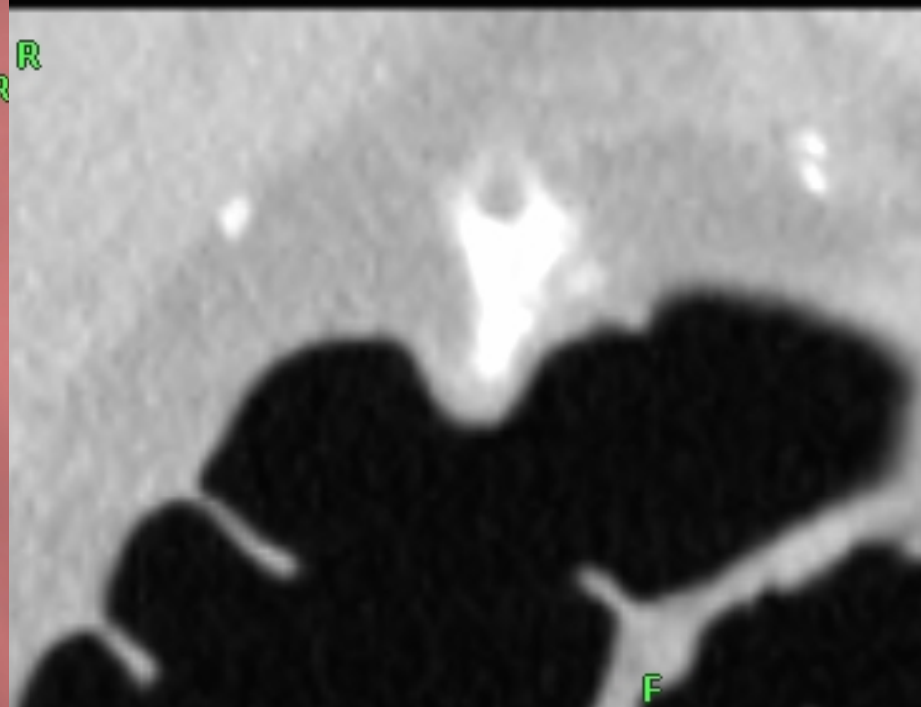


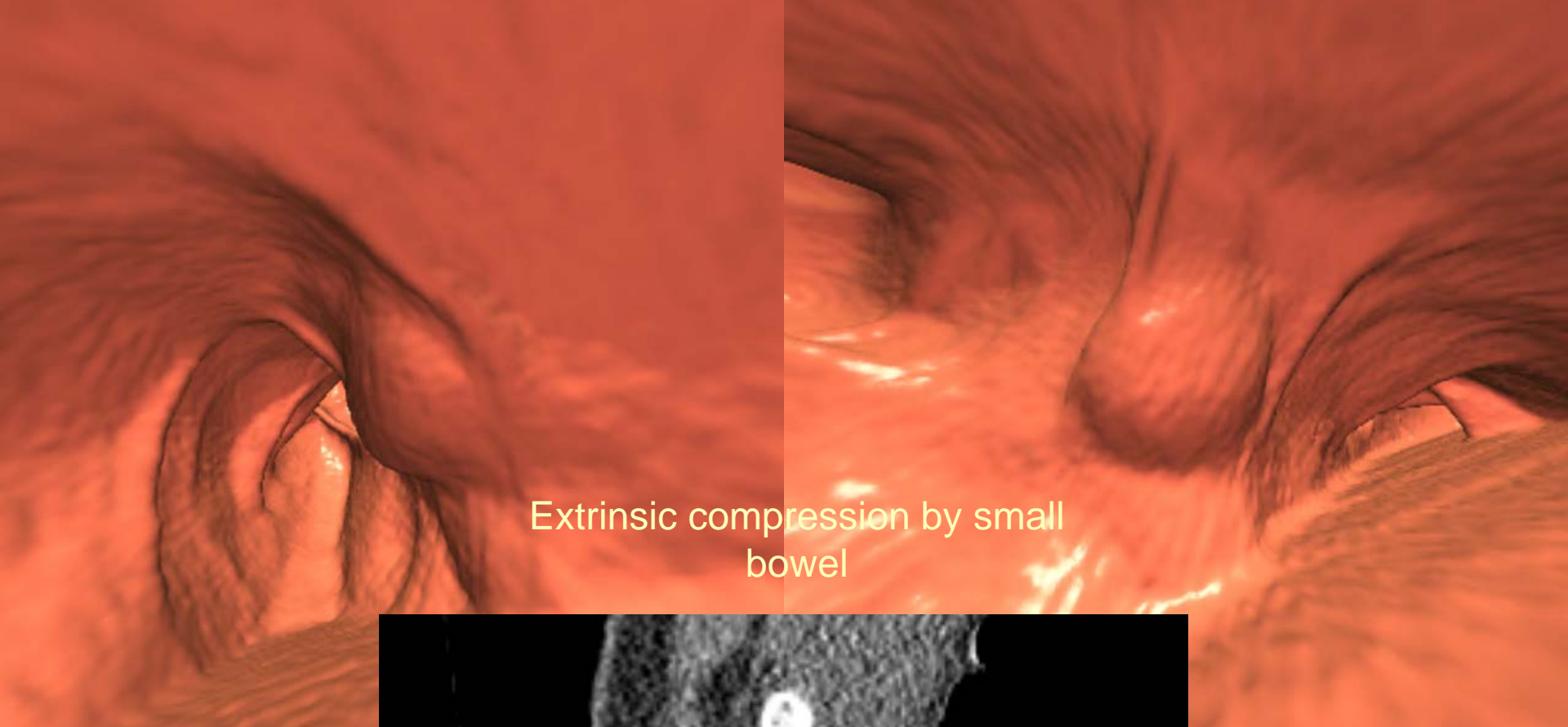




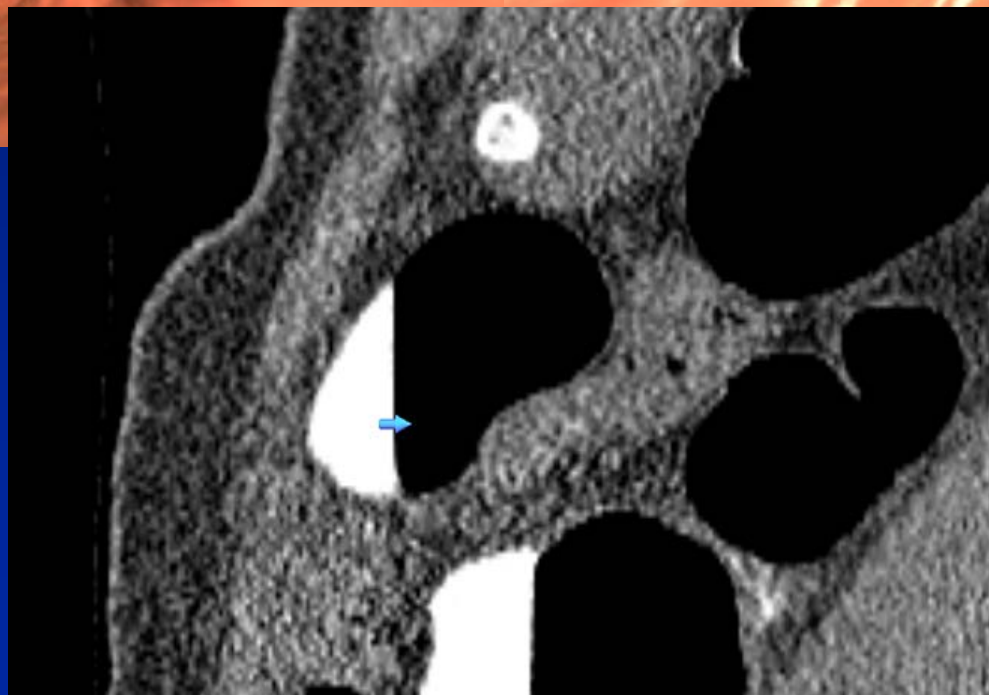
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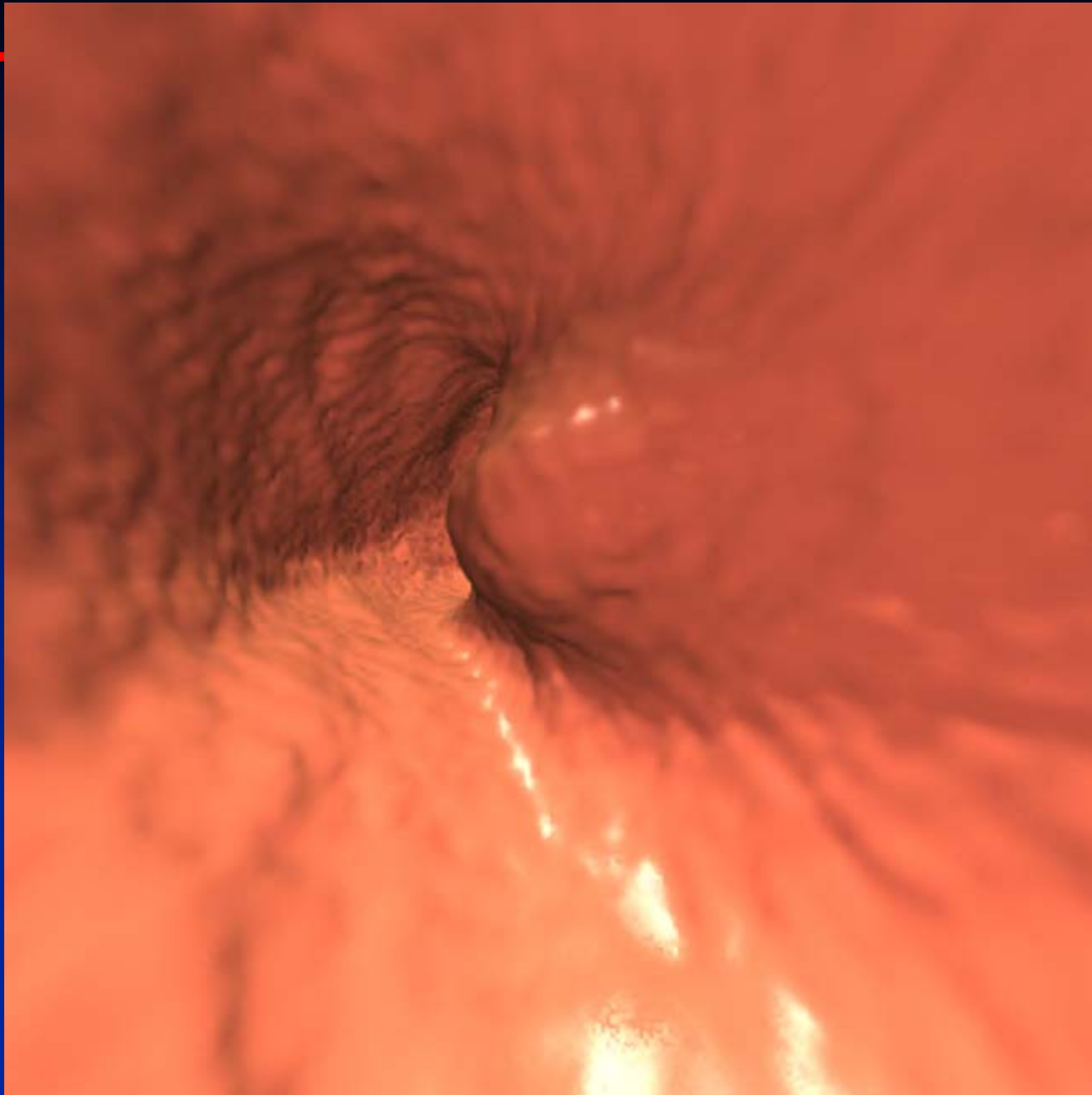
Extrinsic compression by xiphoid process of sternum

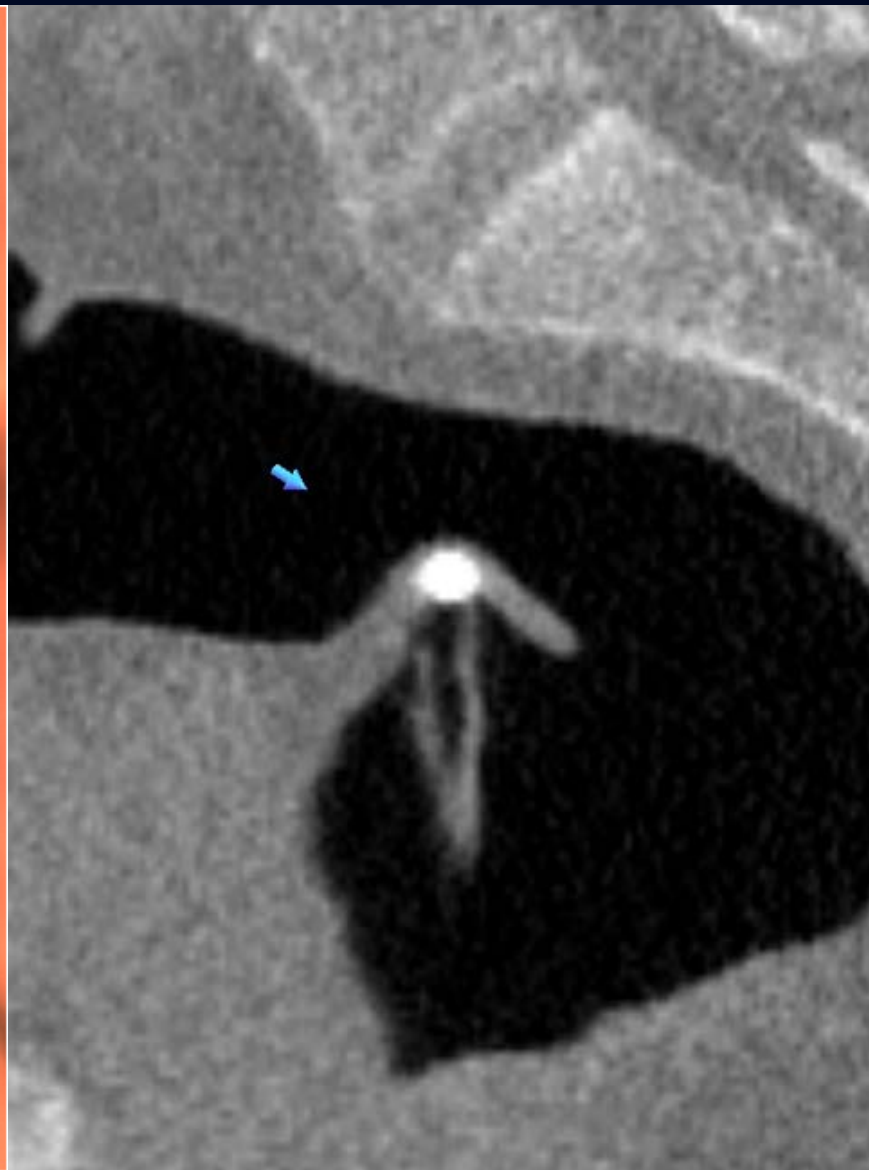
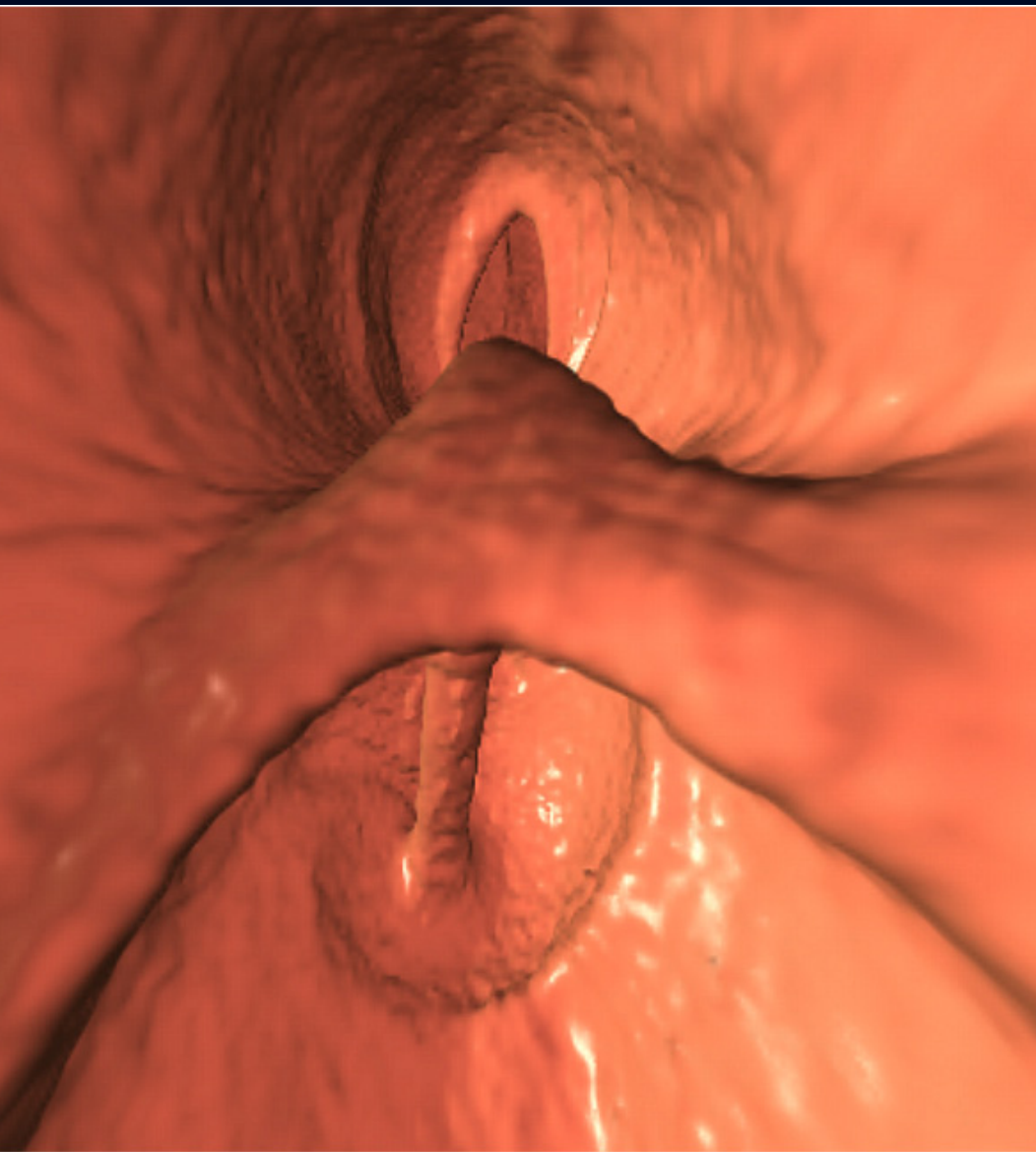




Extrinsic compression by small bowel

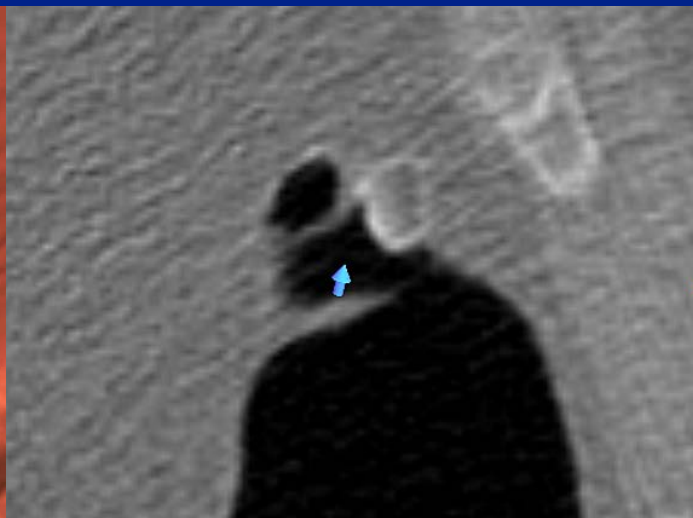
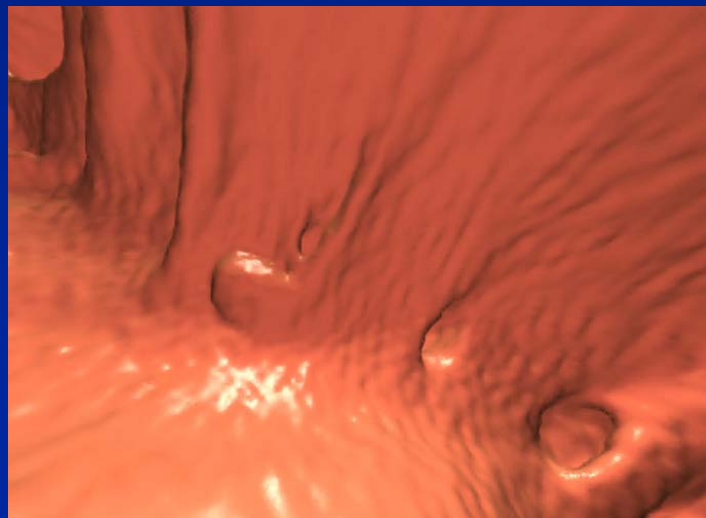
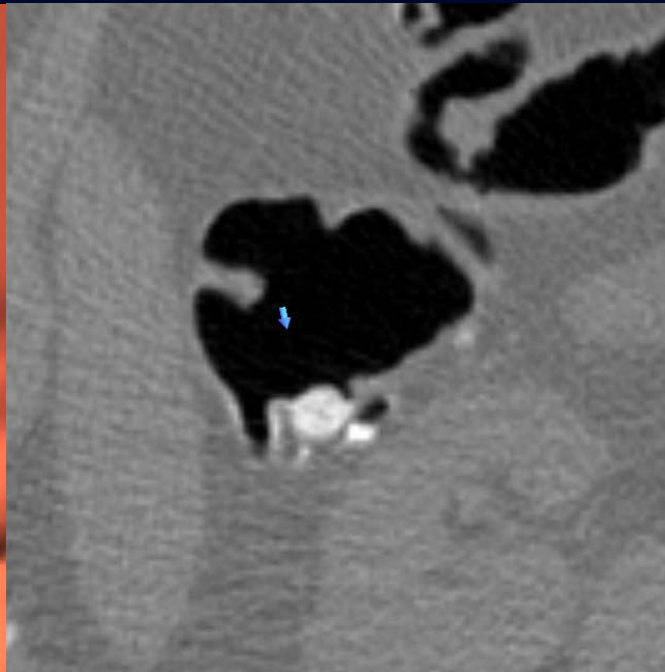
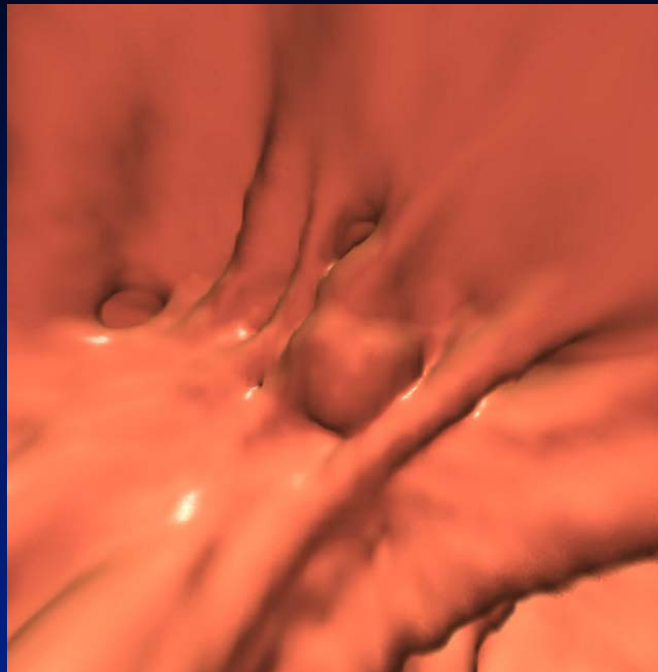






# Fecal Impacted Diverticulum

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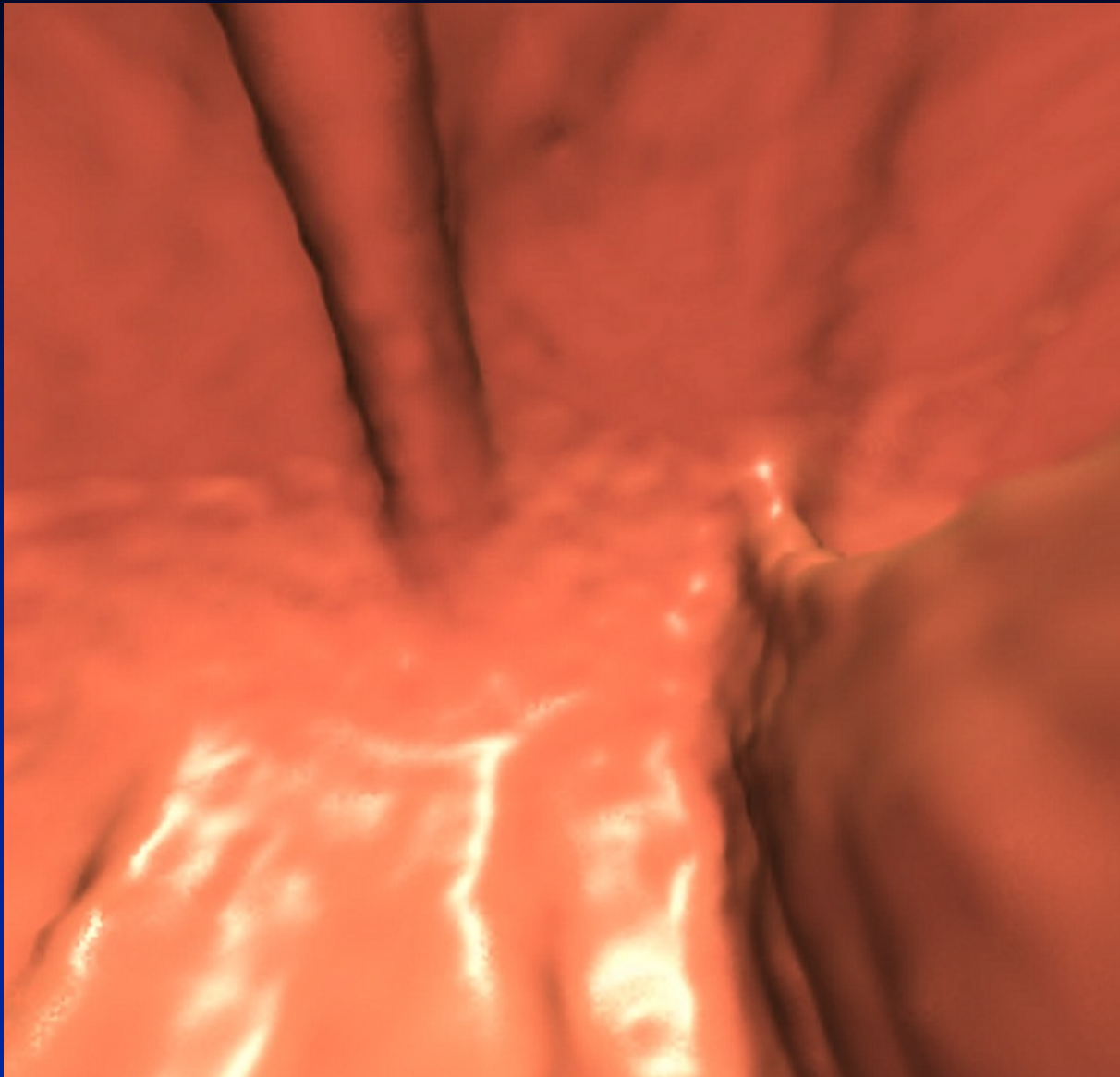
## 3-D Review – False Negatives

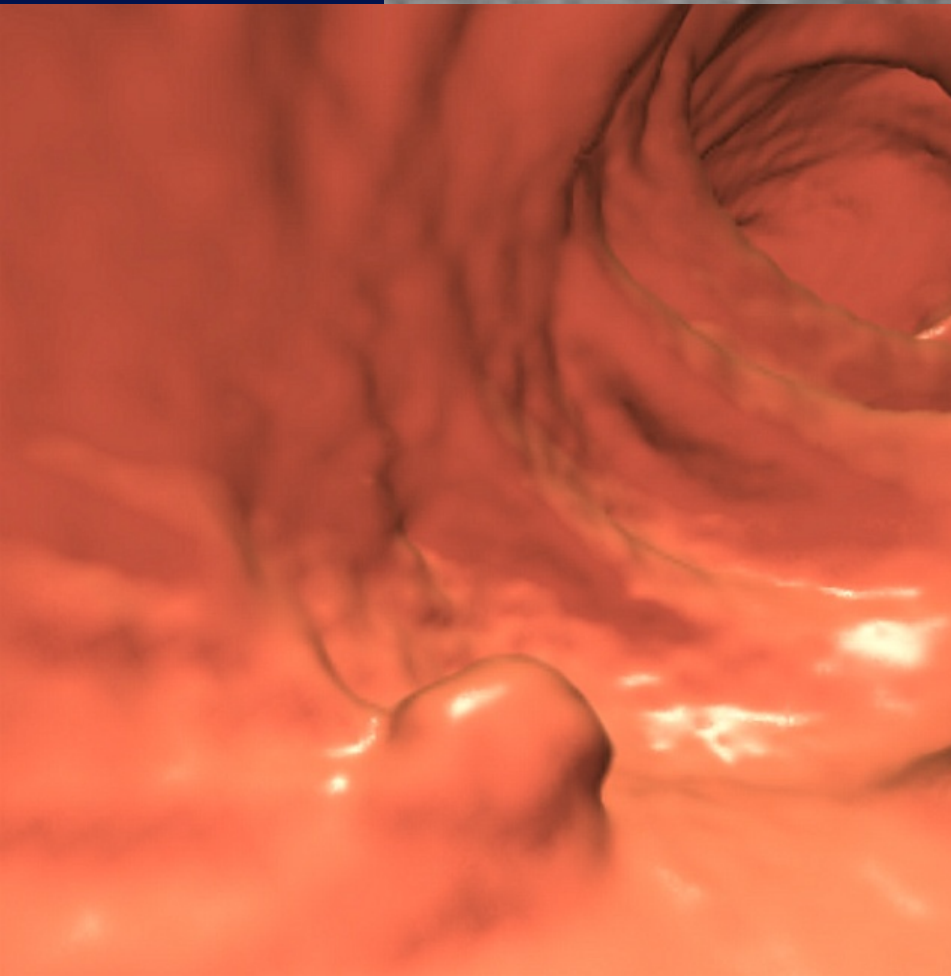
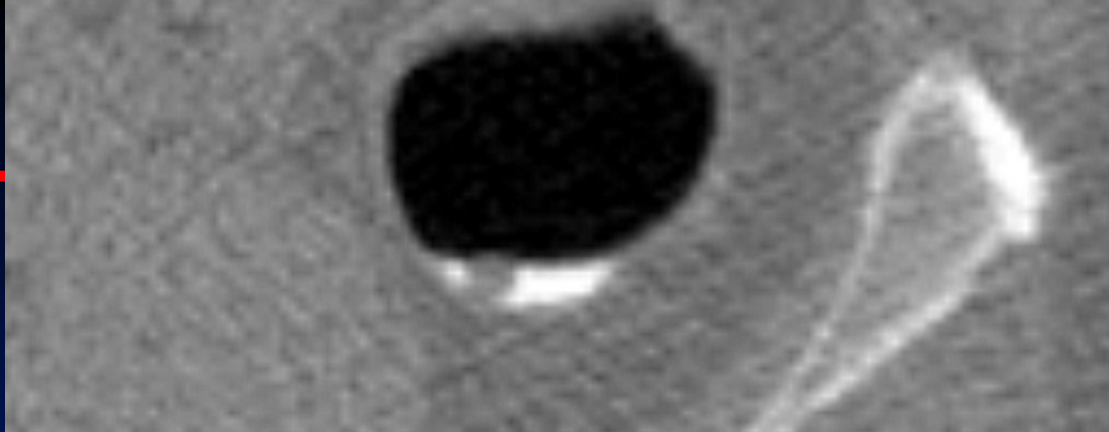
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- ◆ Lesions obscured in fluid pools
- ◆ Lesions in deep folds
- ◆ Polyp mistaken for feces in poor prep exam
- ◆ Lesions missed due to narrow FOV

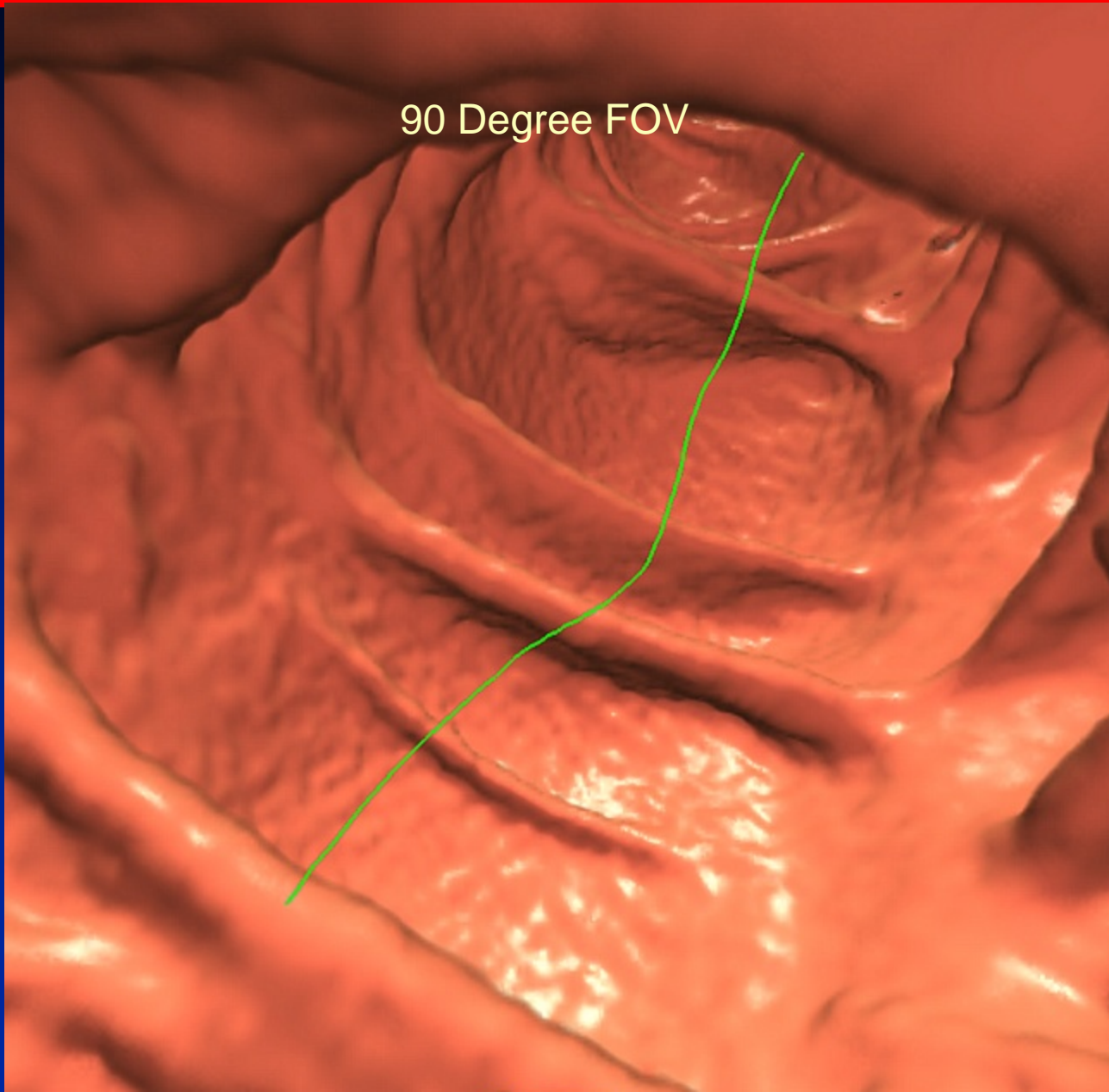
# Polyp obscured in fluid pool

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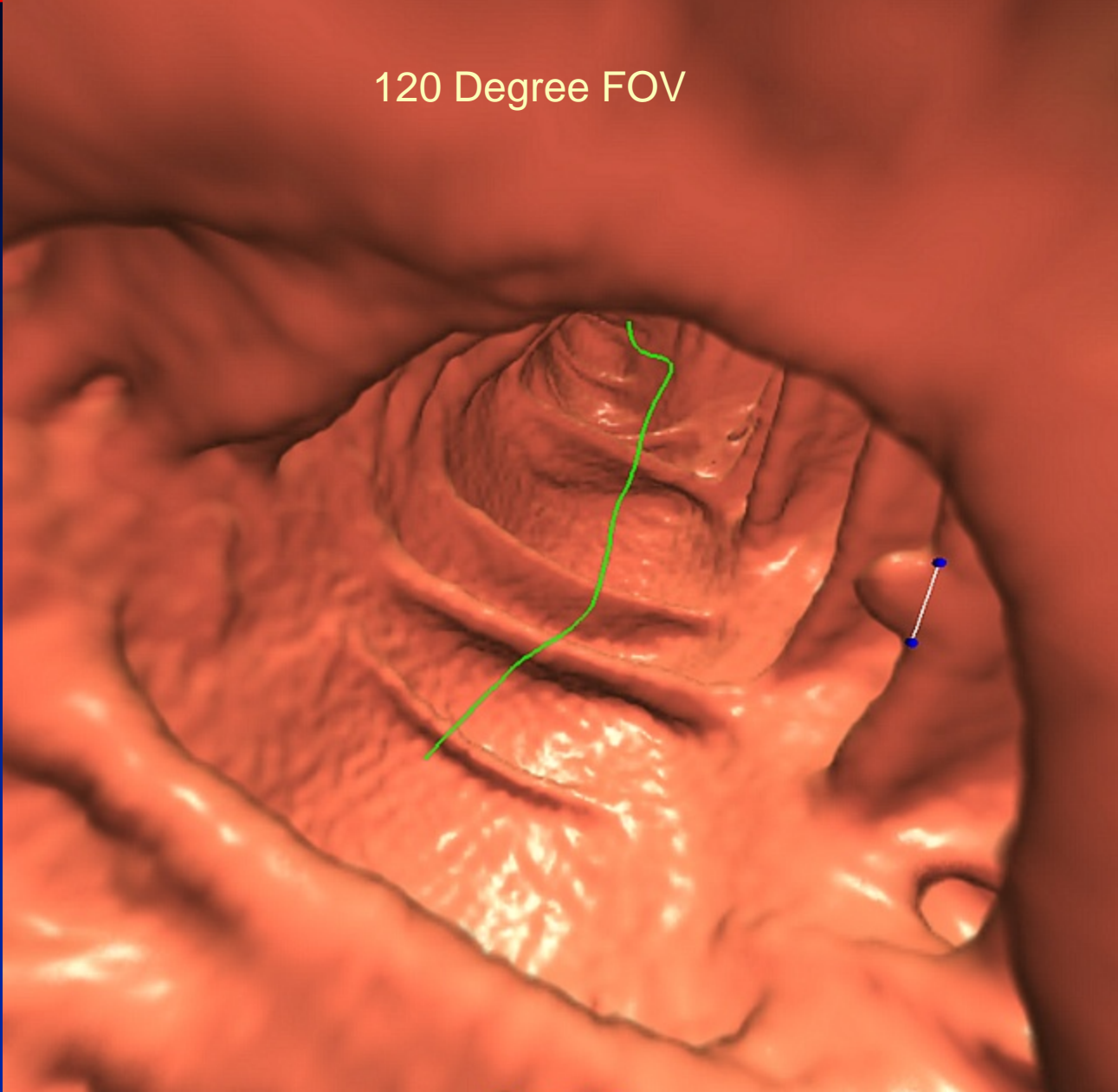




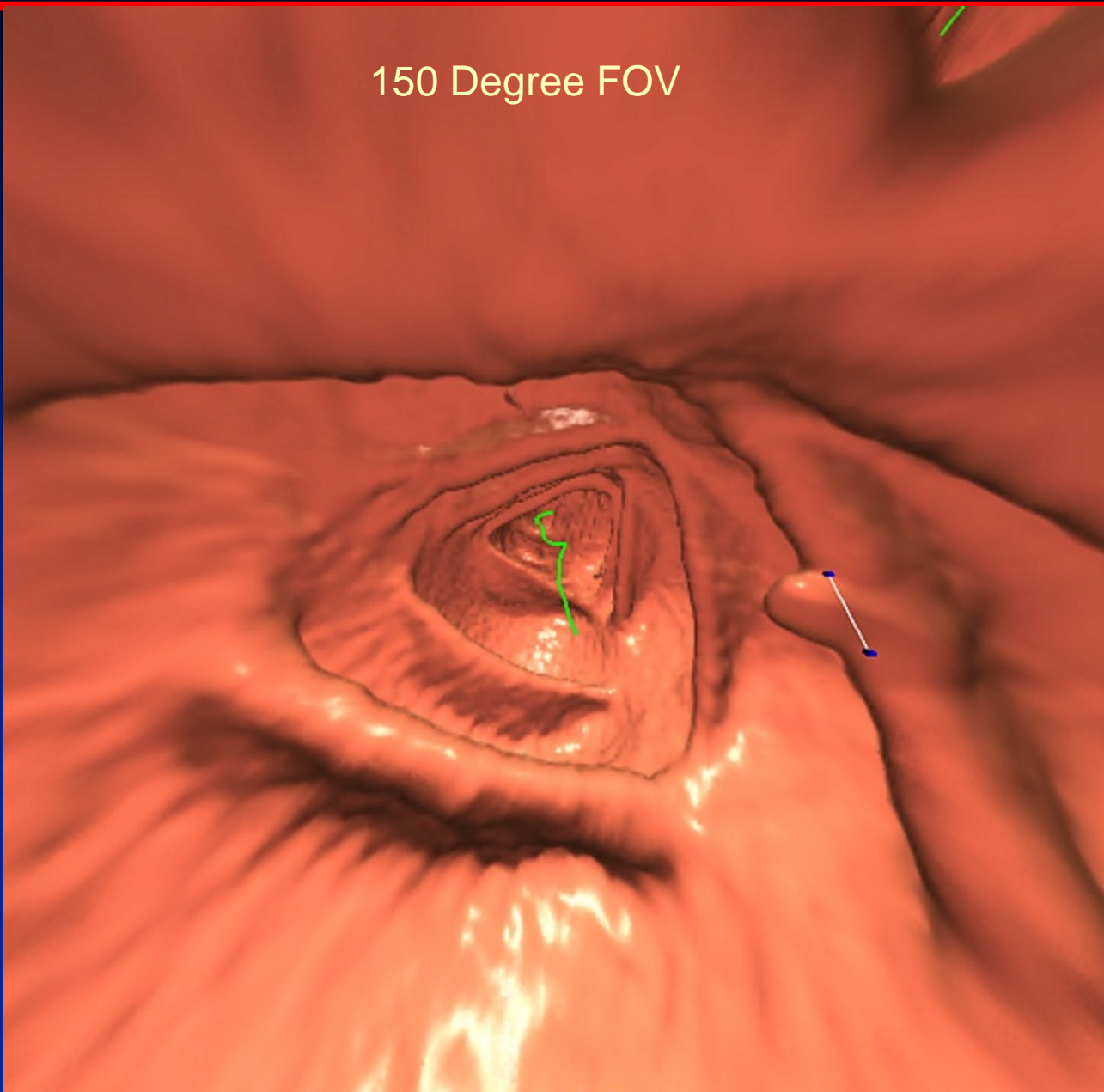
# Effect of FOV



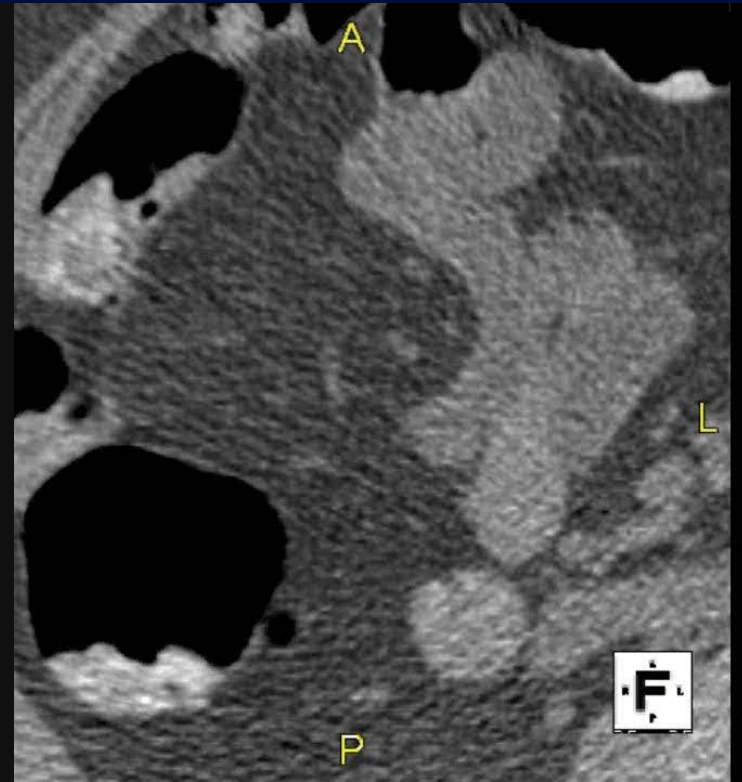
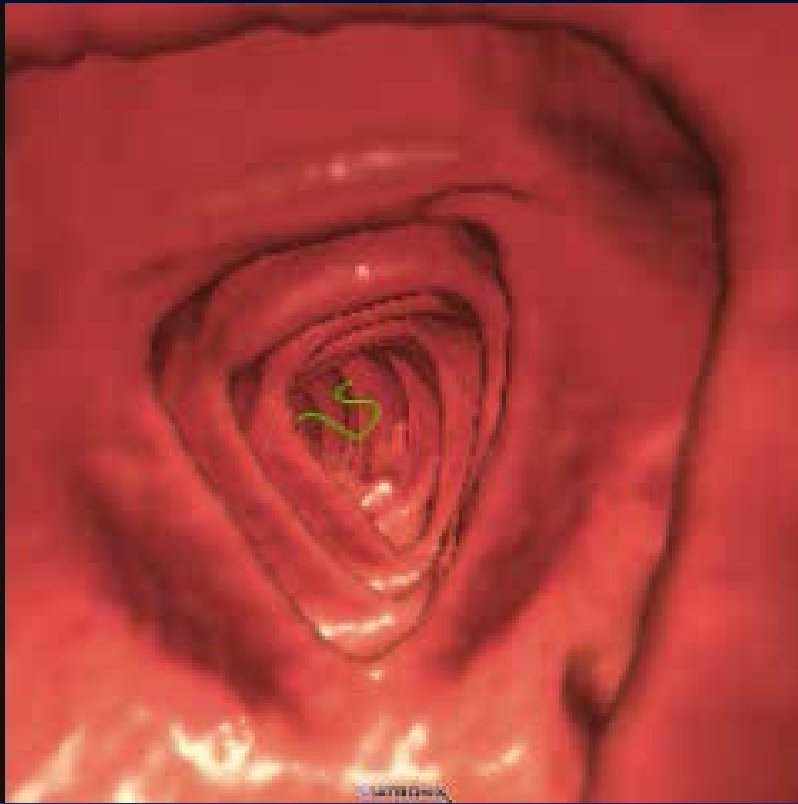
120 Degree FOV

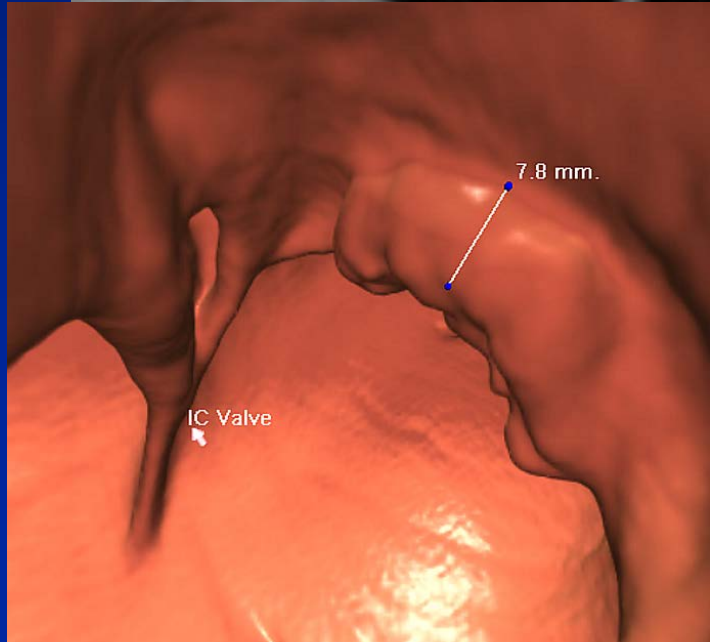
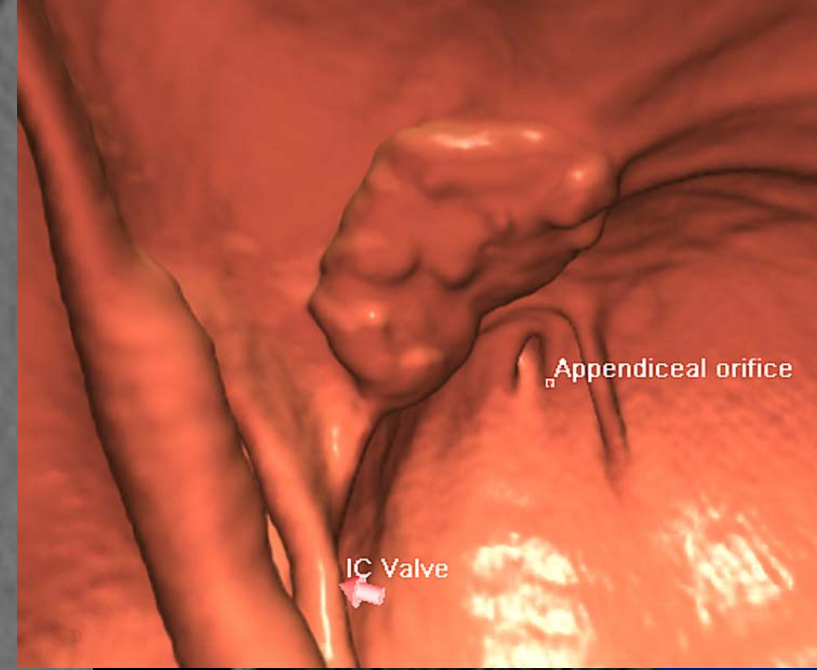


150 Degree FOV



# Don't Depend on 3D with poor prep





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# Non-Polypoid "Flat" Colorectal Neoplasia (NP-CRN)

# NP-CRN - Background

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- ◆ Subset of colonic polyps with nonpolypoid plaque-like morphology (includes both hyperplastic and adenomatous lesions)
- ◆ Prevalence and clinical significance source of great debate due to imprecise and often subjective definitions and inclusion of diminutive lesions
- ◆ Distinction between relatively flat and completely flat or flat and depressed lesions which are quite rare
- ◆ For given size polypoid lesions greatly outnumber flat lesions and more often harbor aggressive histology
- ◆ Majority of flat polyps detected (and missed) at VC tend to be hyperplastic

# NP-CRN - Background

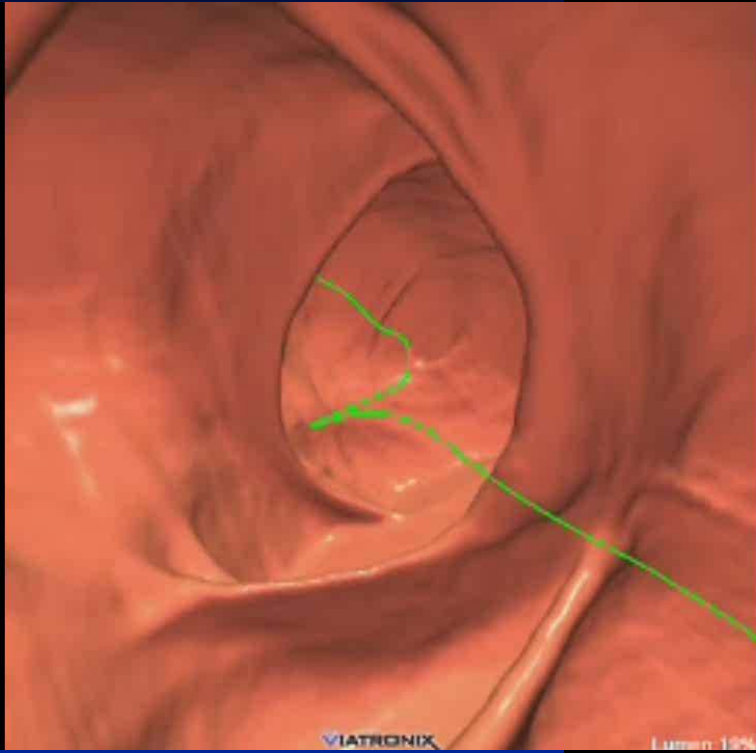
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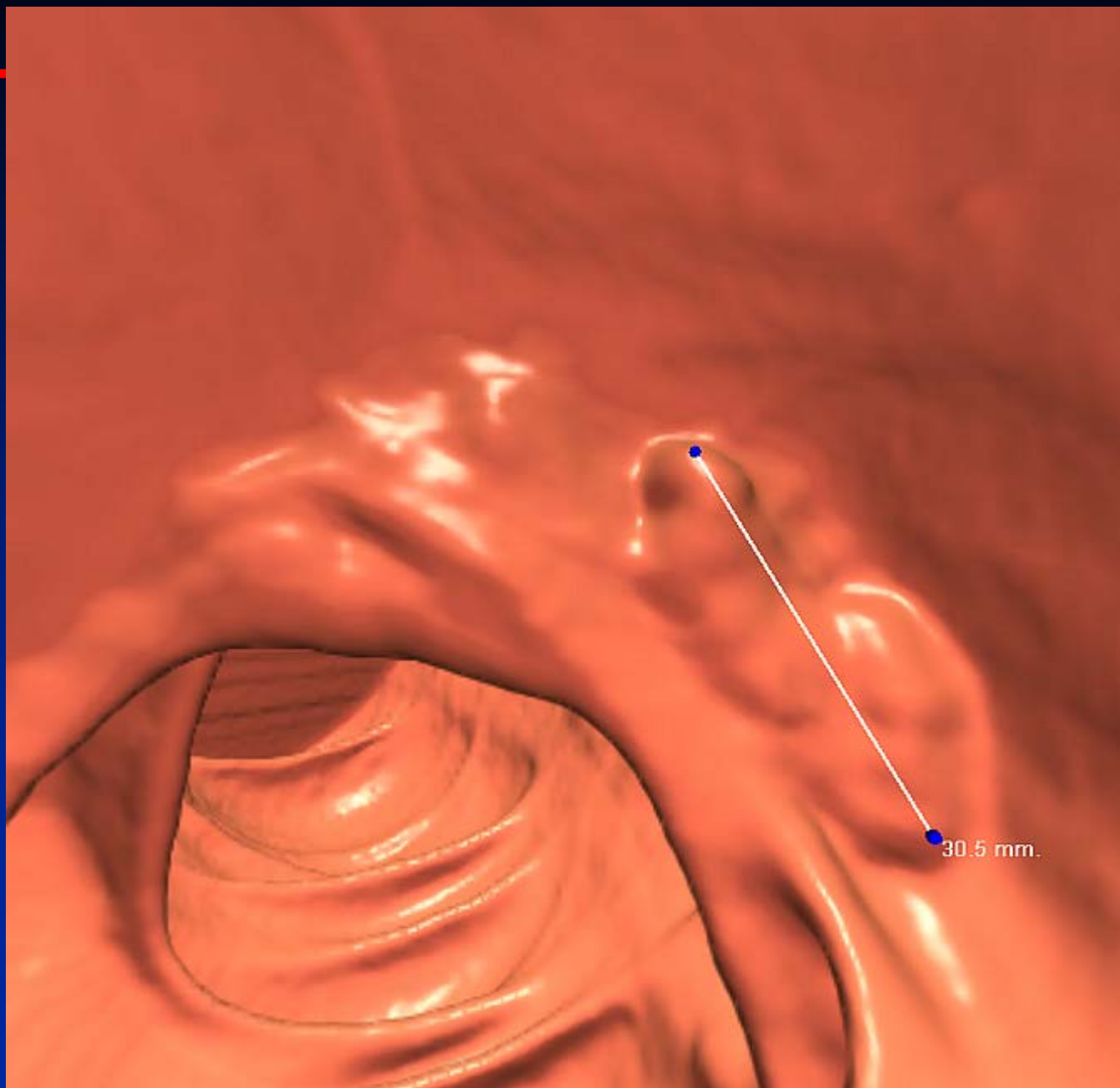
- u Traditional definition of height less than half of lesion width likely included many sessile lesions
- u Preferred definition is lesions  $< 3$  cm with lesion height  $< 3$  mm
- u More difficult to detect at both VC and OC
- u Sensitivity of combined 2D/3D approach appears satisfactory
- u Oral contrast tagging important to aid detection
- u Use of widened soft tissue window can be helpful

# NP-CRN - Background

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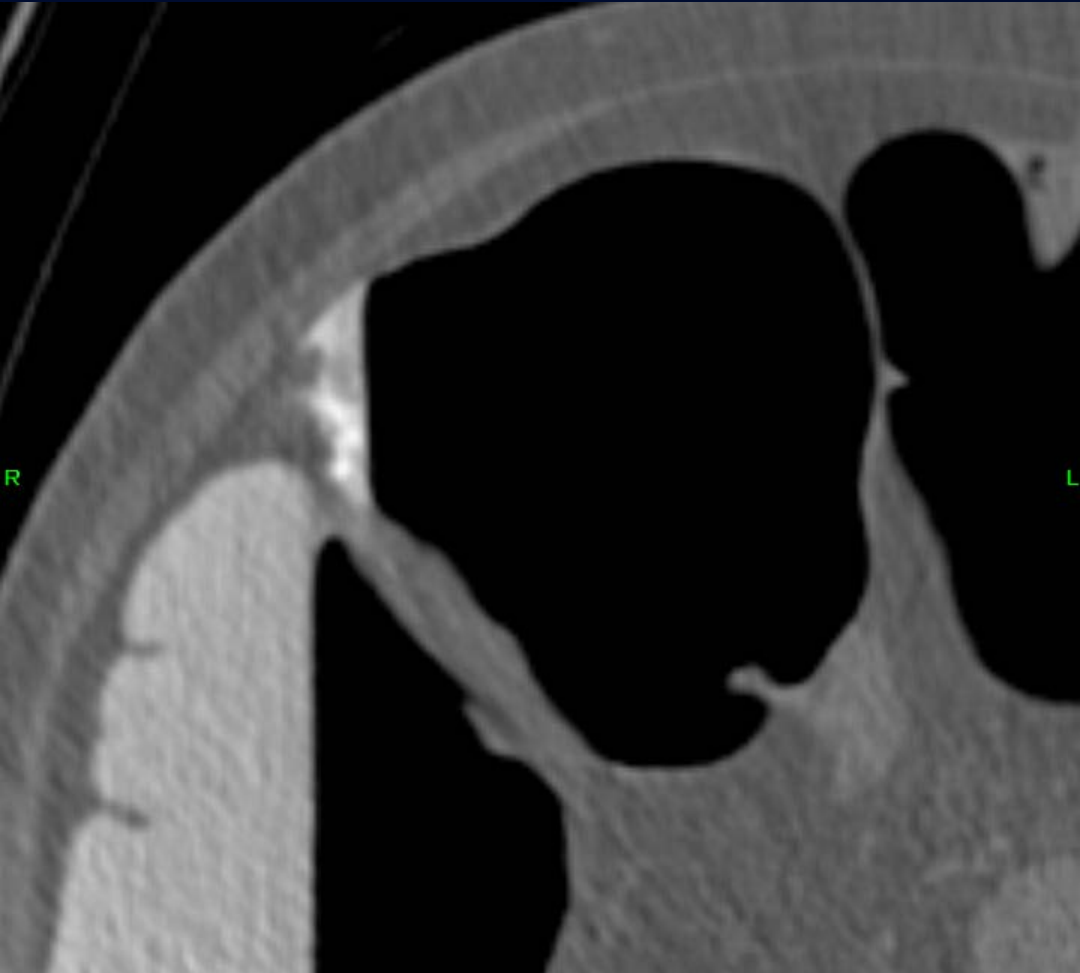
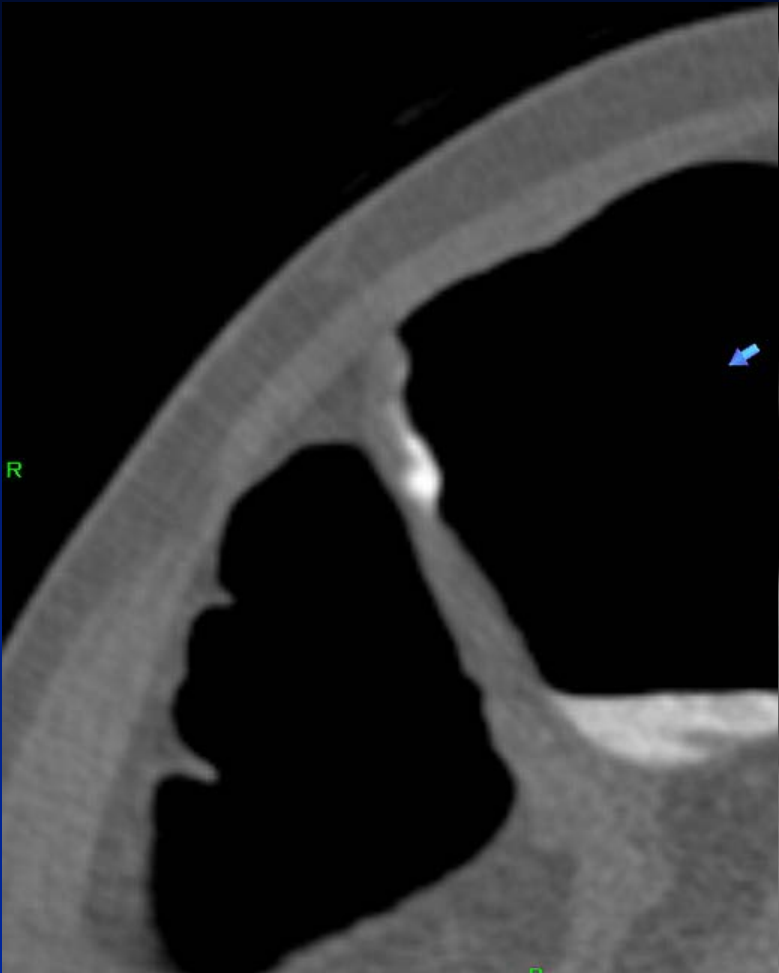
- ◆ Flat lesions  $> 3$  cm are termed carpet or laterally spreading lesions which have strong predilection for rectum or cecum
- ◆ This subset of flat lesions is of most concern and can be subtle at VC
- ◆ Carpet lesions can have thickness up to 1 cm
- ◆ Increased predilection for advanced histology but low rate of malignancy despite large size



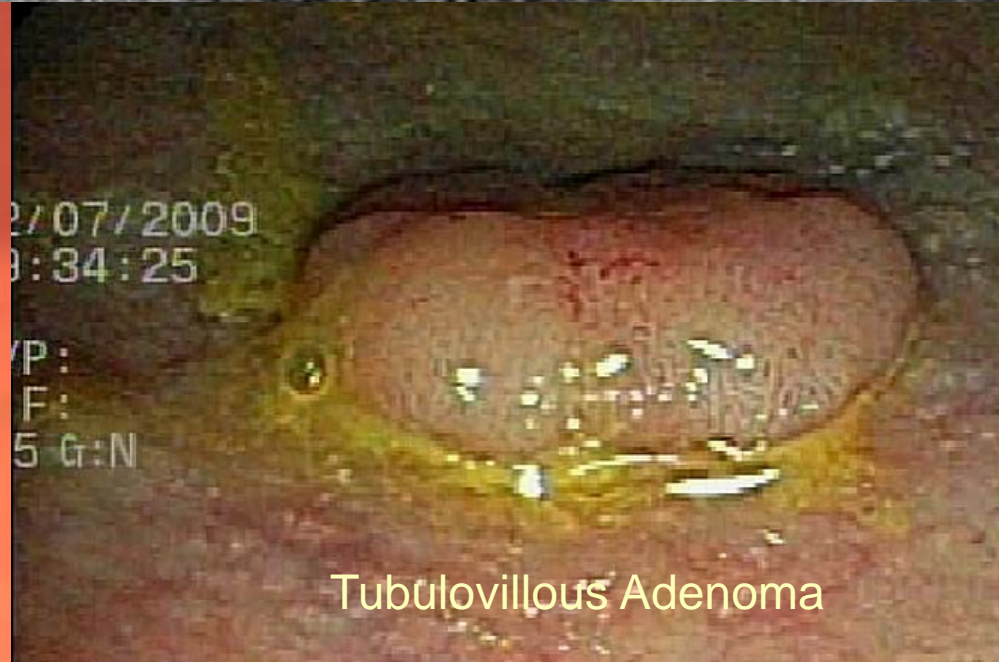
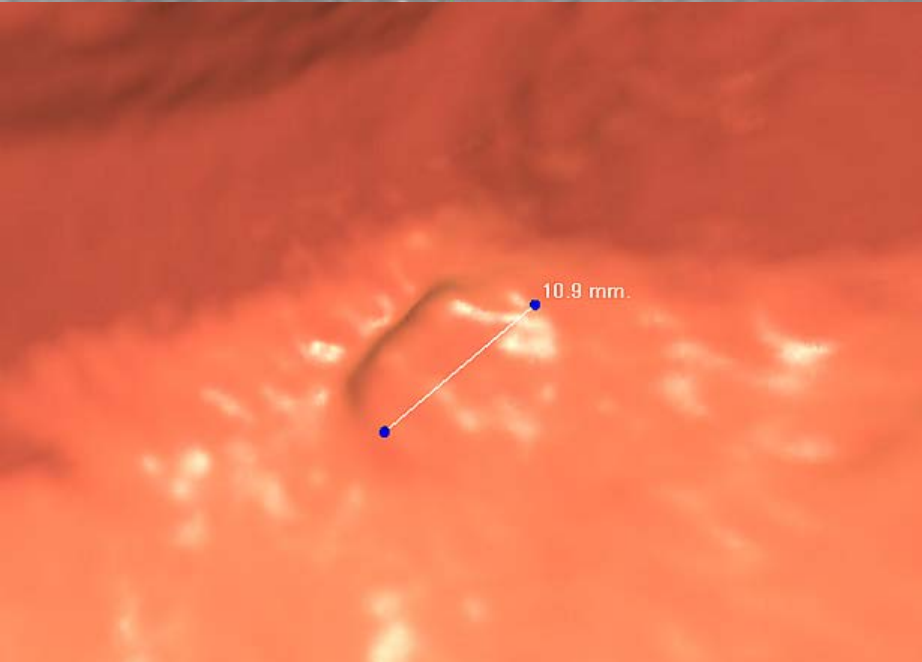
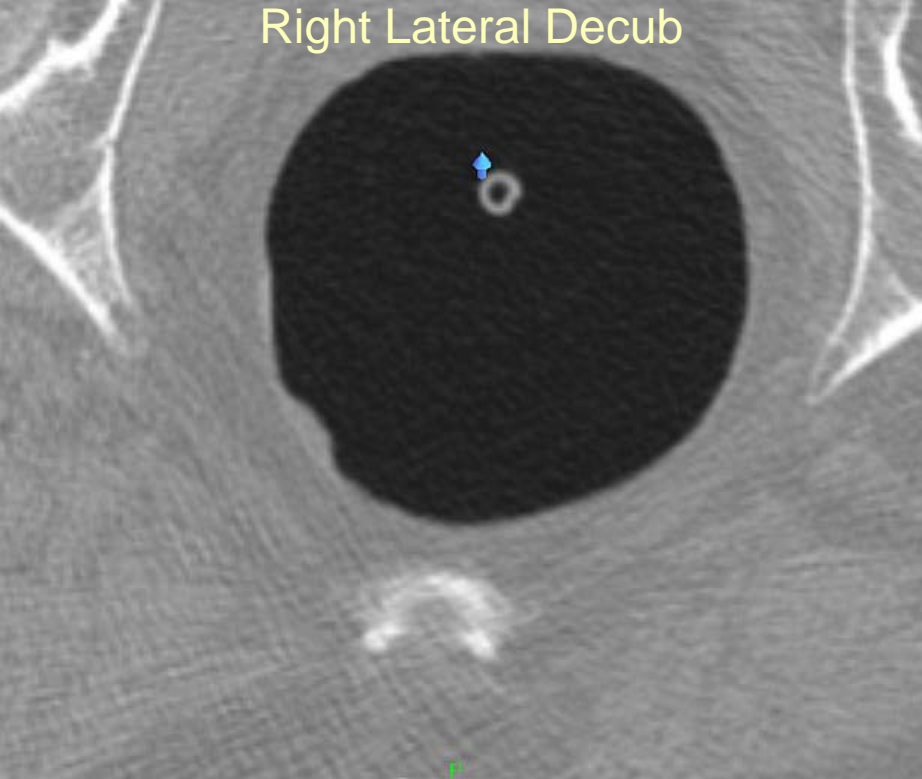


30.5 mm.

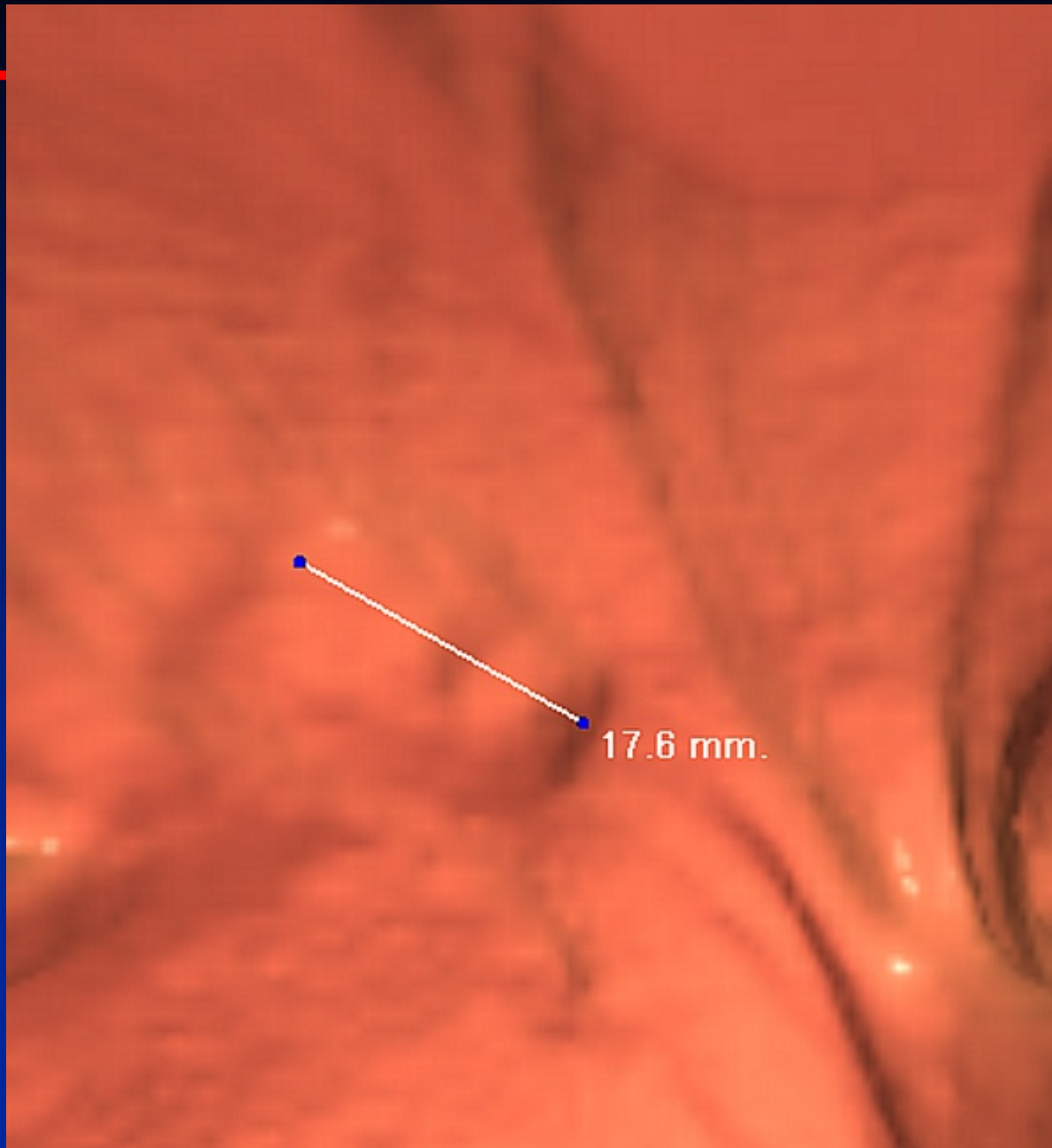
Tubular Adenoma



Right Lateral Decub

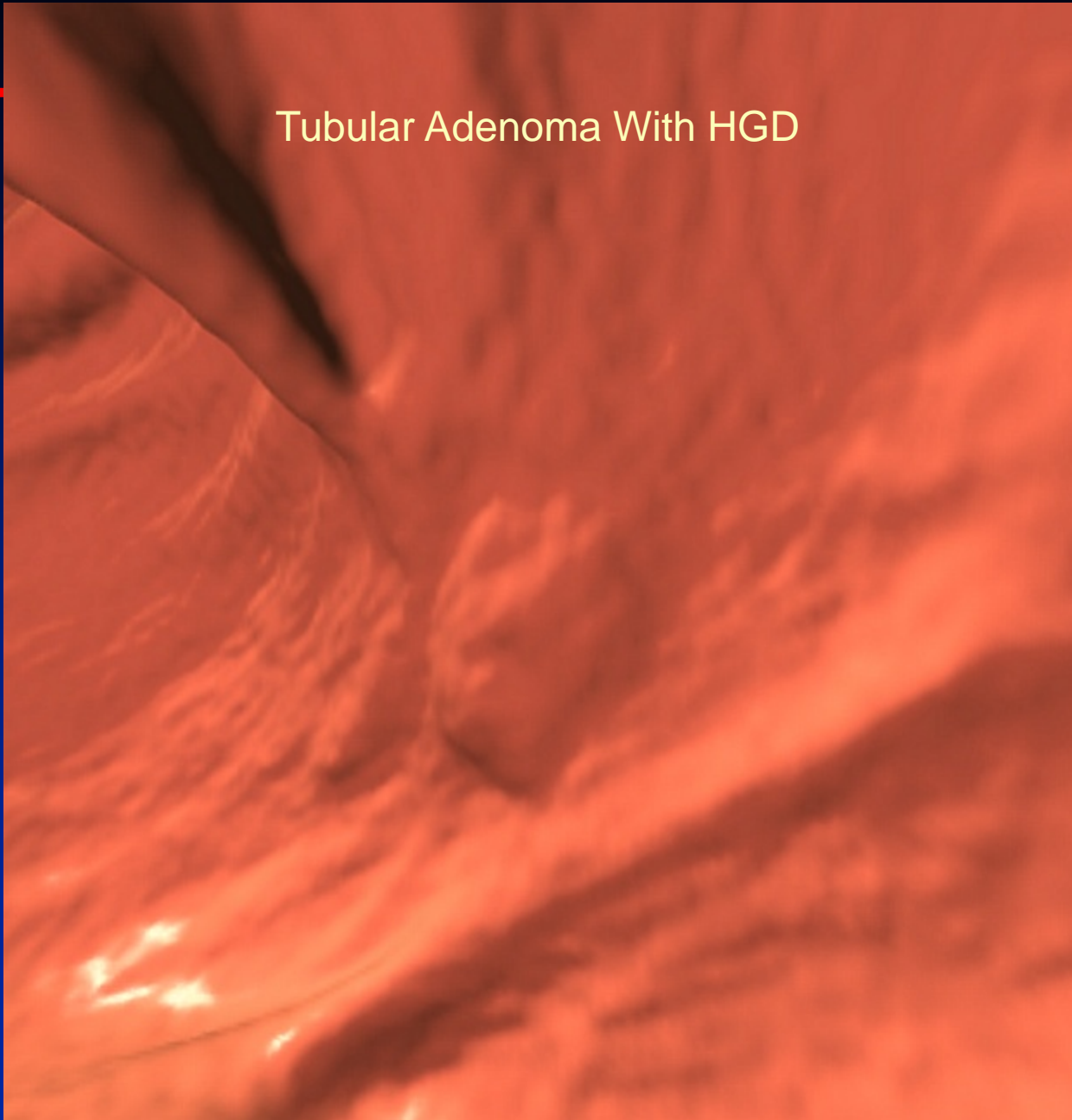


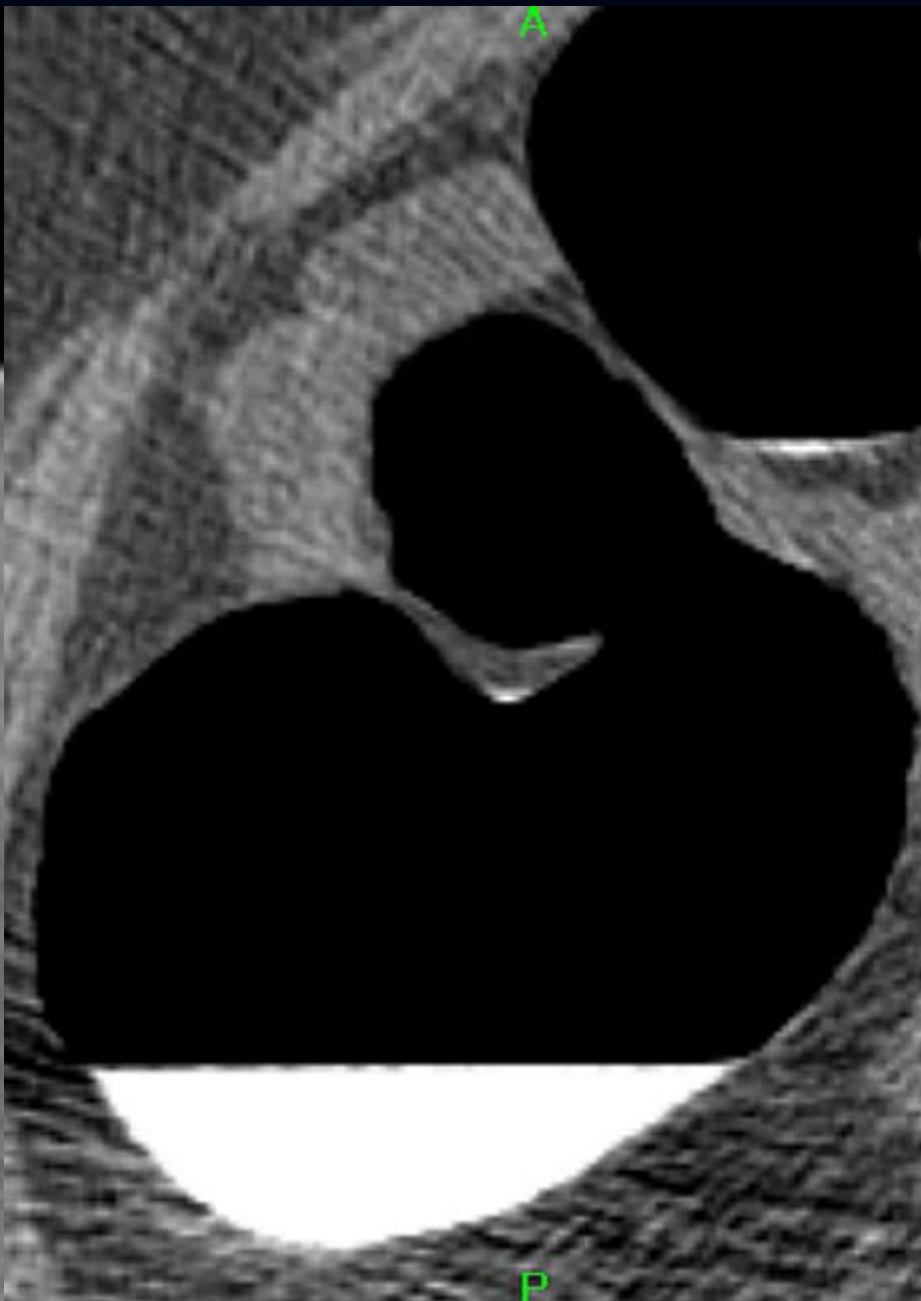
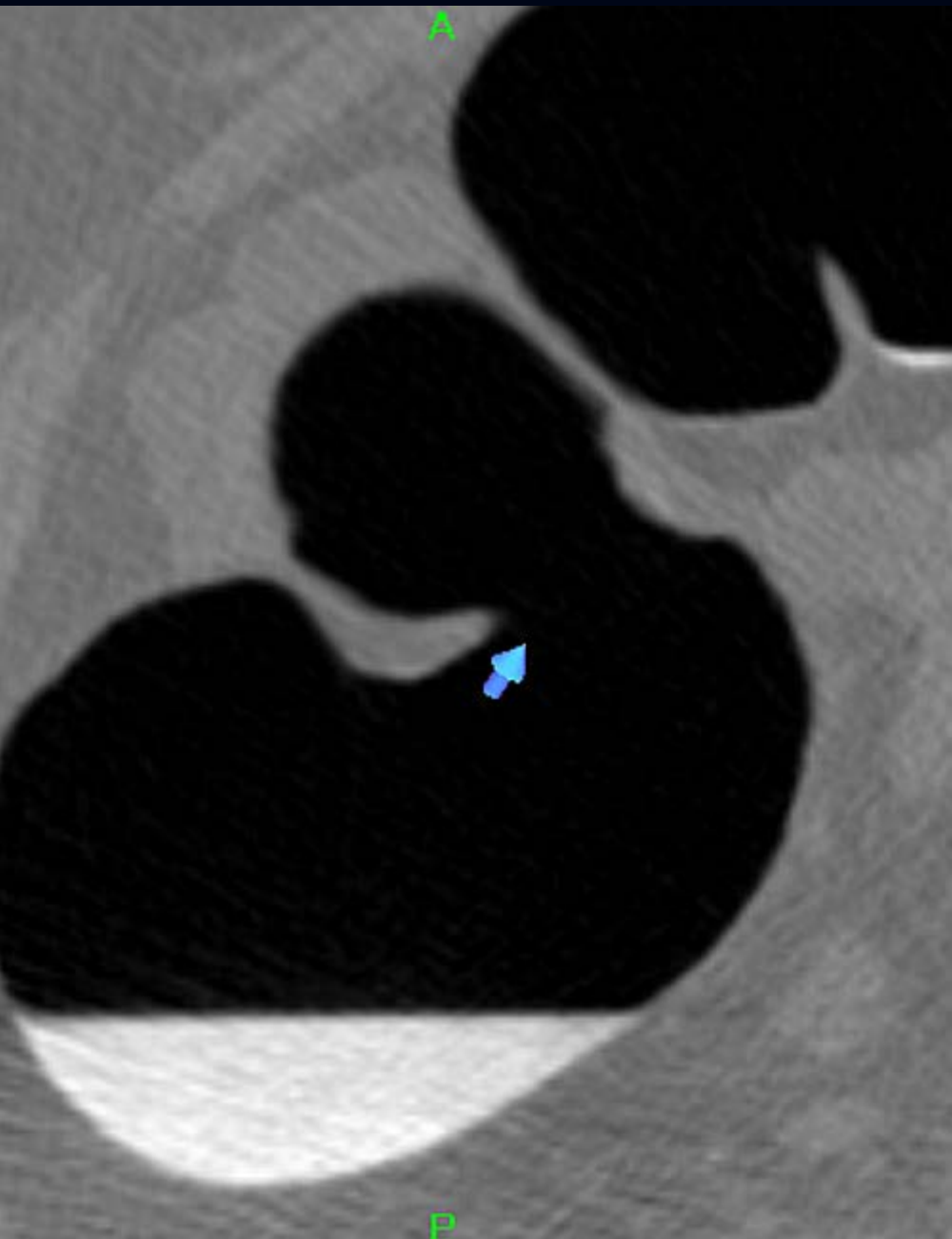
Tubulovillous Adenoma

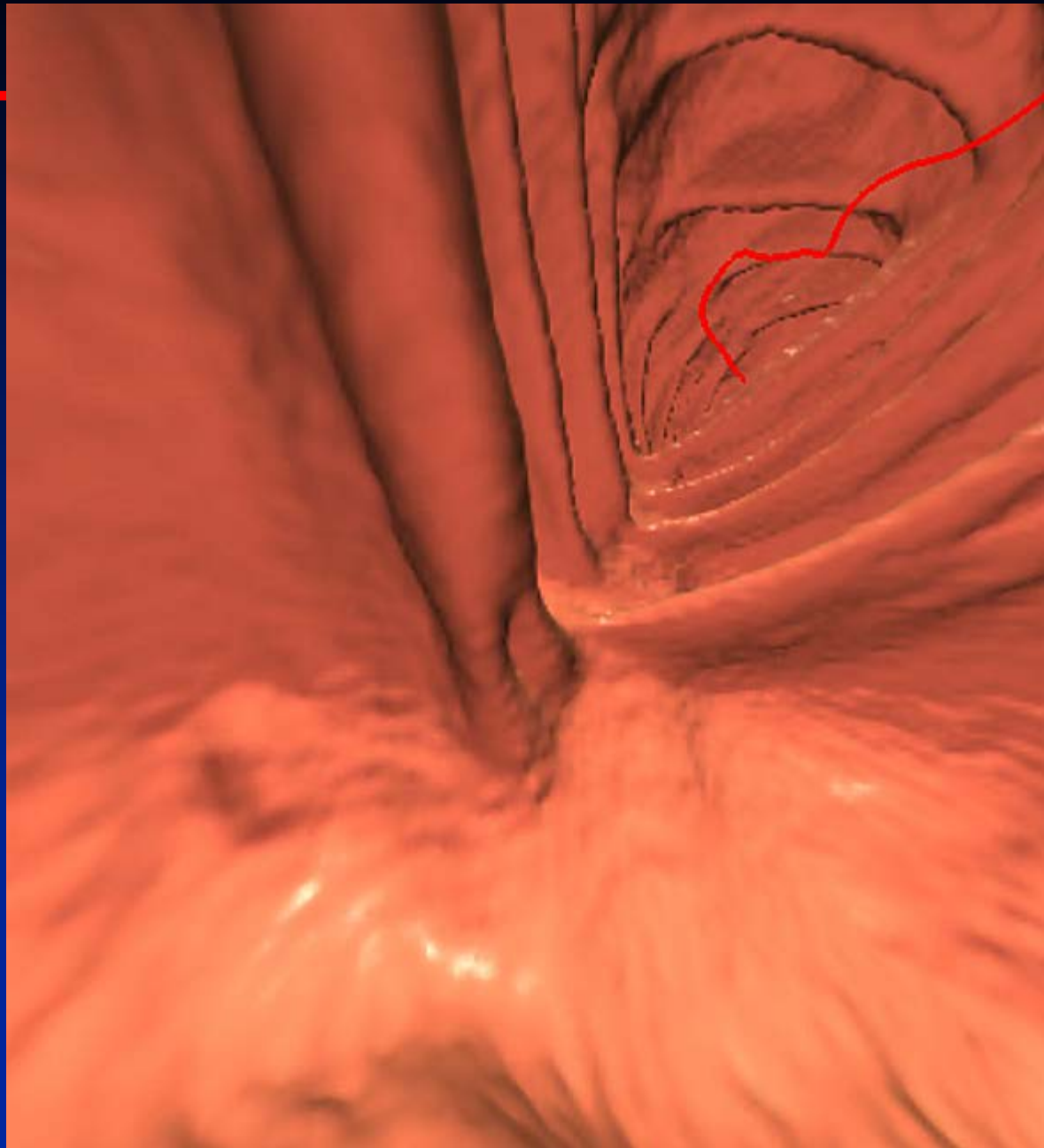


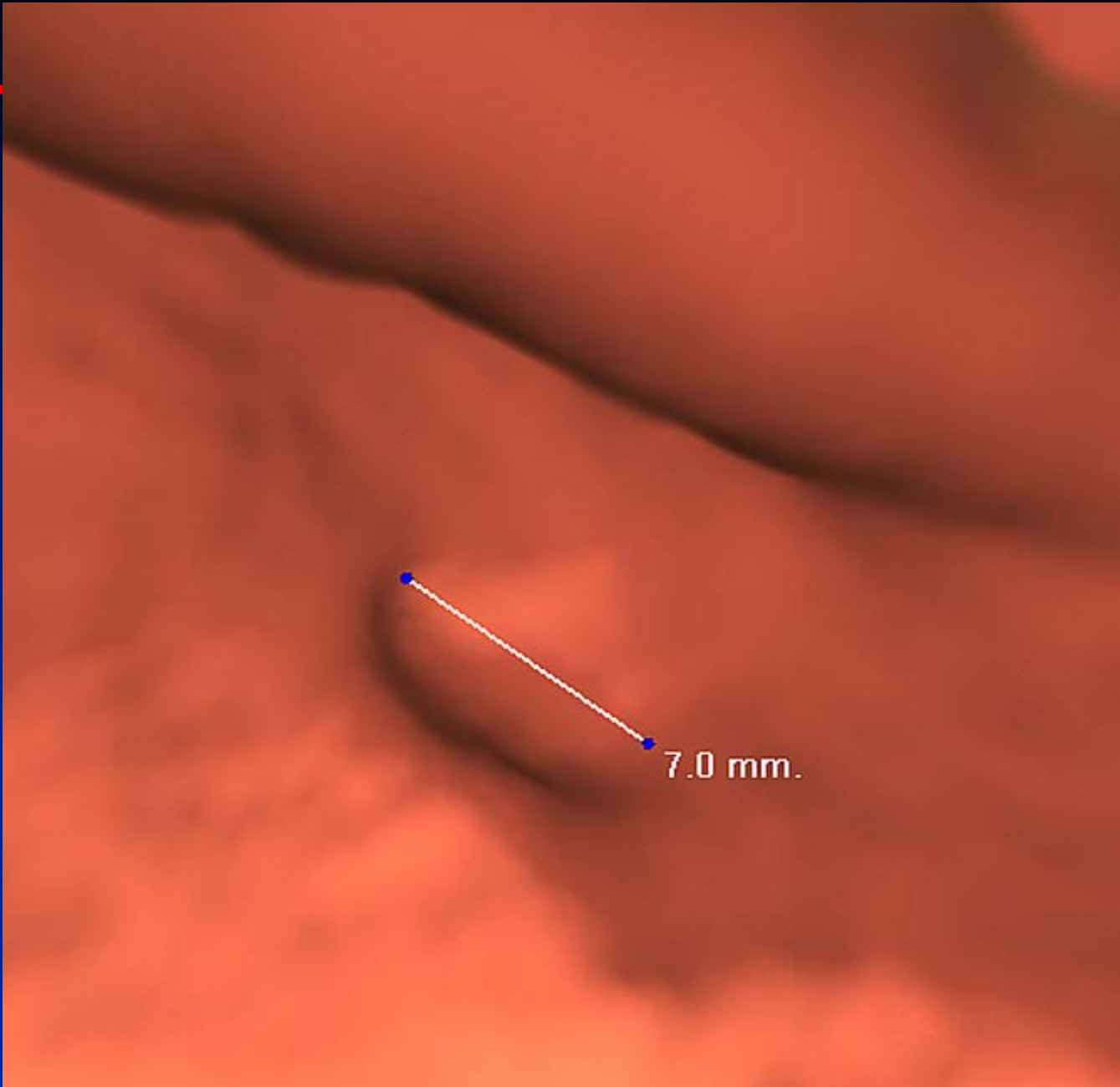
17.6 mm.

Tubular Adenoma With HGD

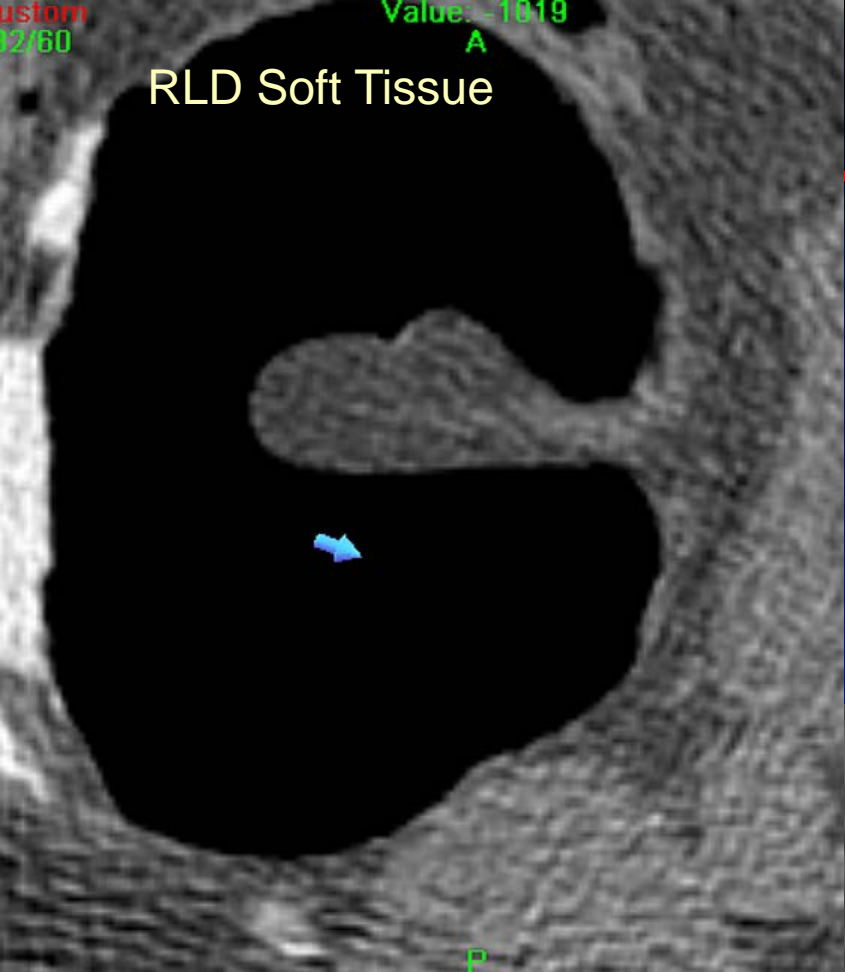




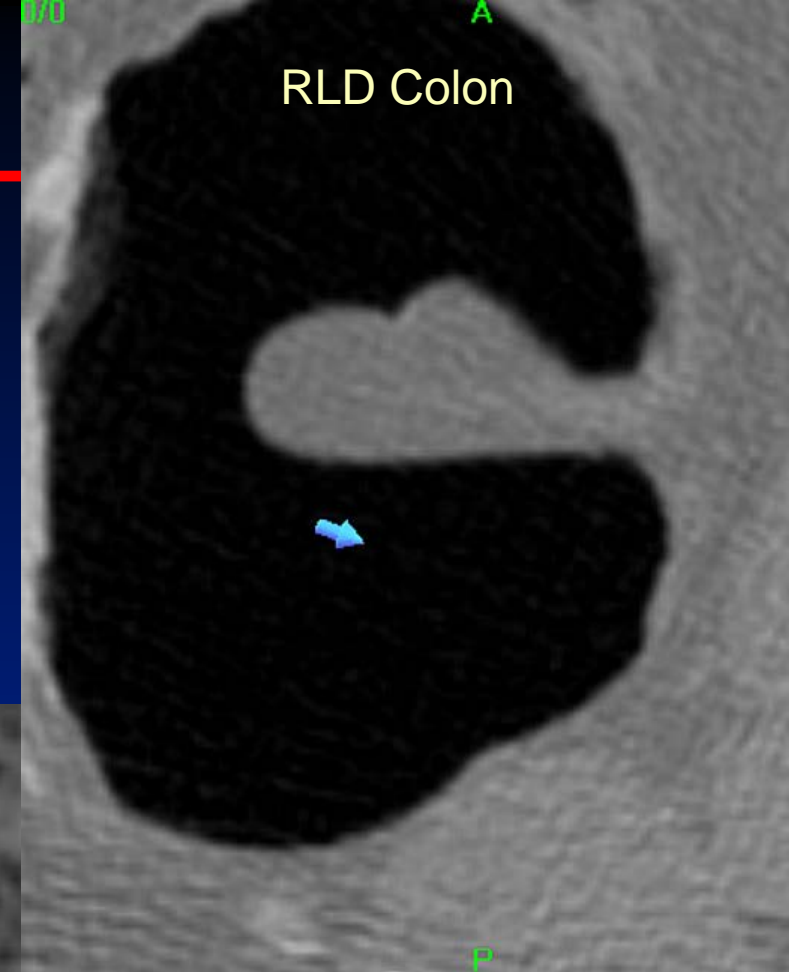




RLD Soft Tissue



RLD Colon

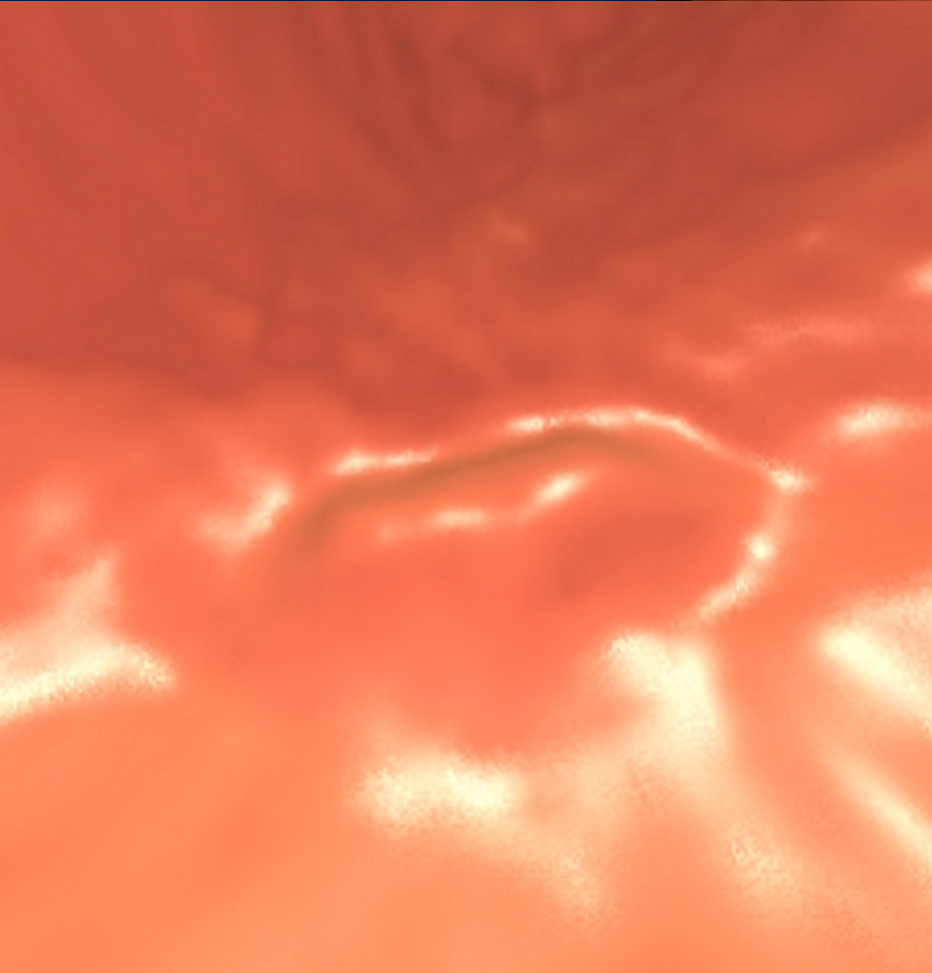


Supine Soft Tissue



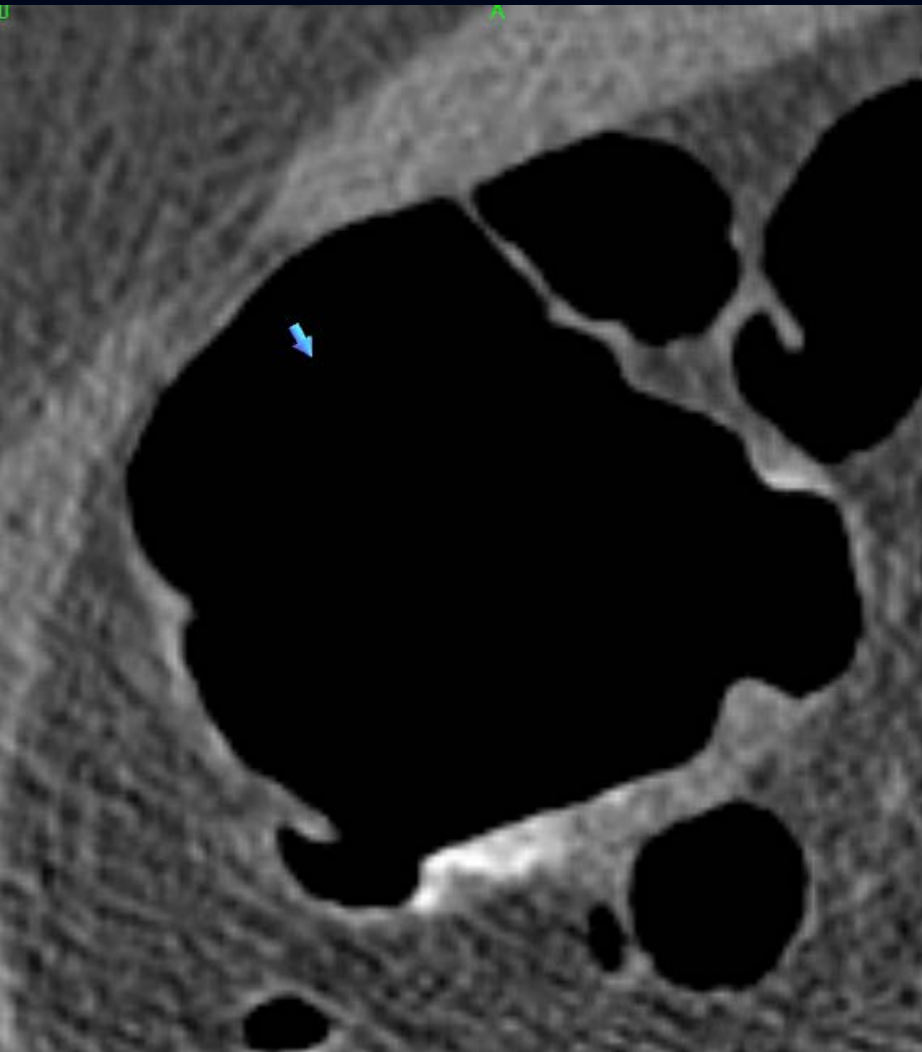
08/21/2009  
11:49:23

VP:  
S, F:  
H:3 G:N

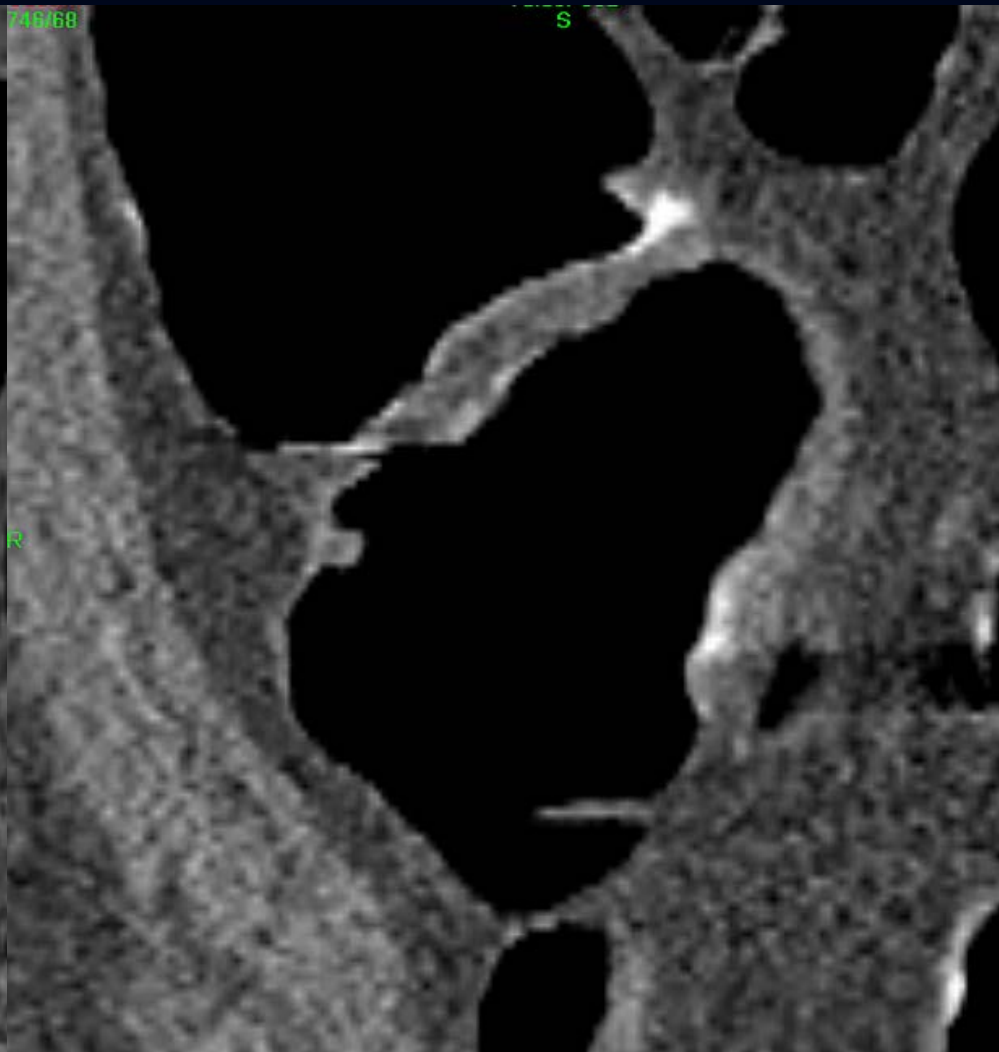


Tubular Adenoma

Supine - Axial

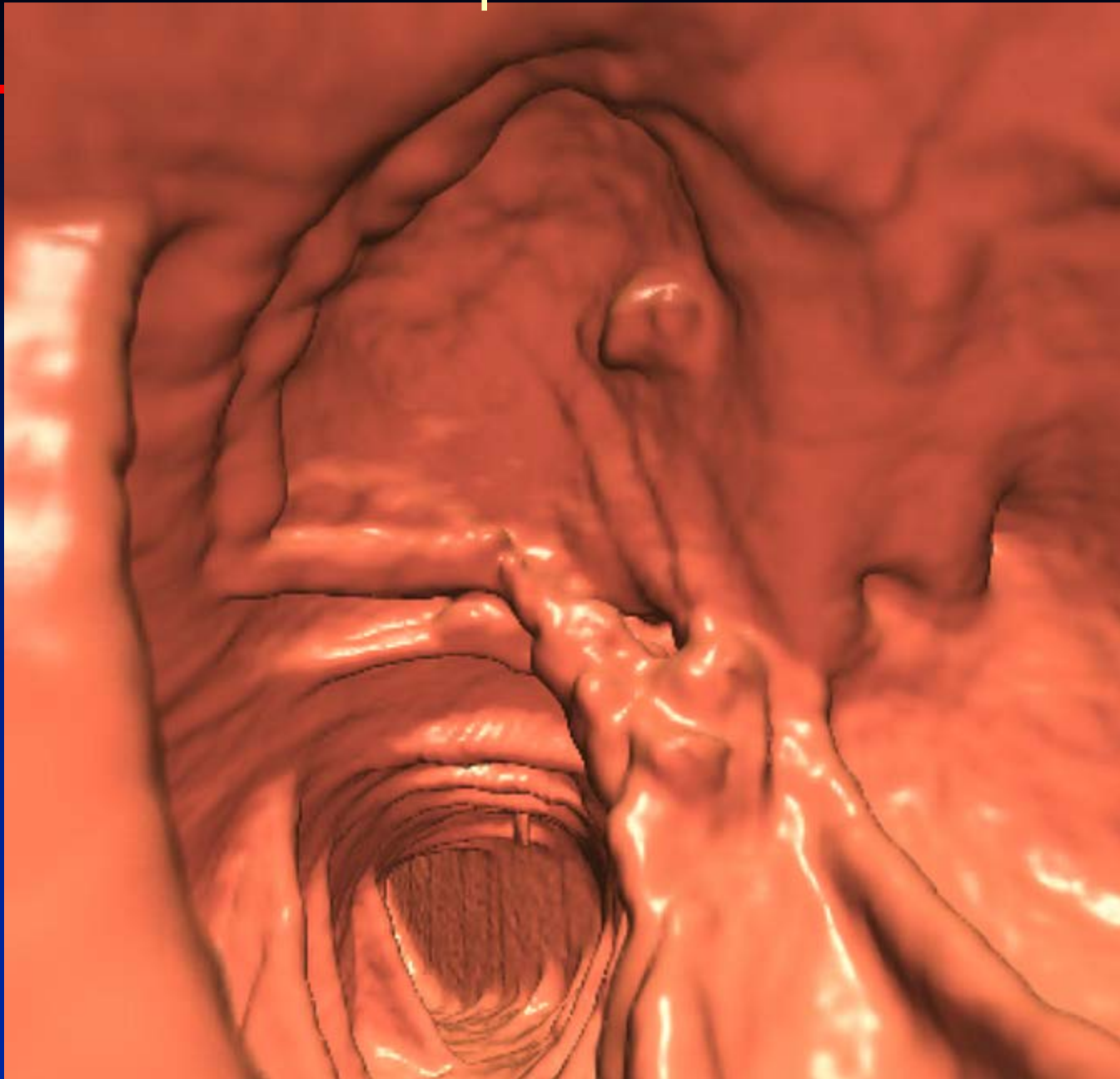


Supine - Coronal

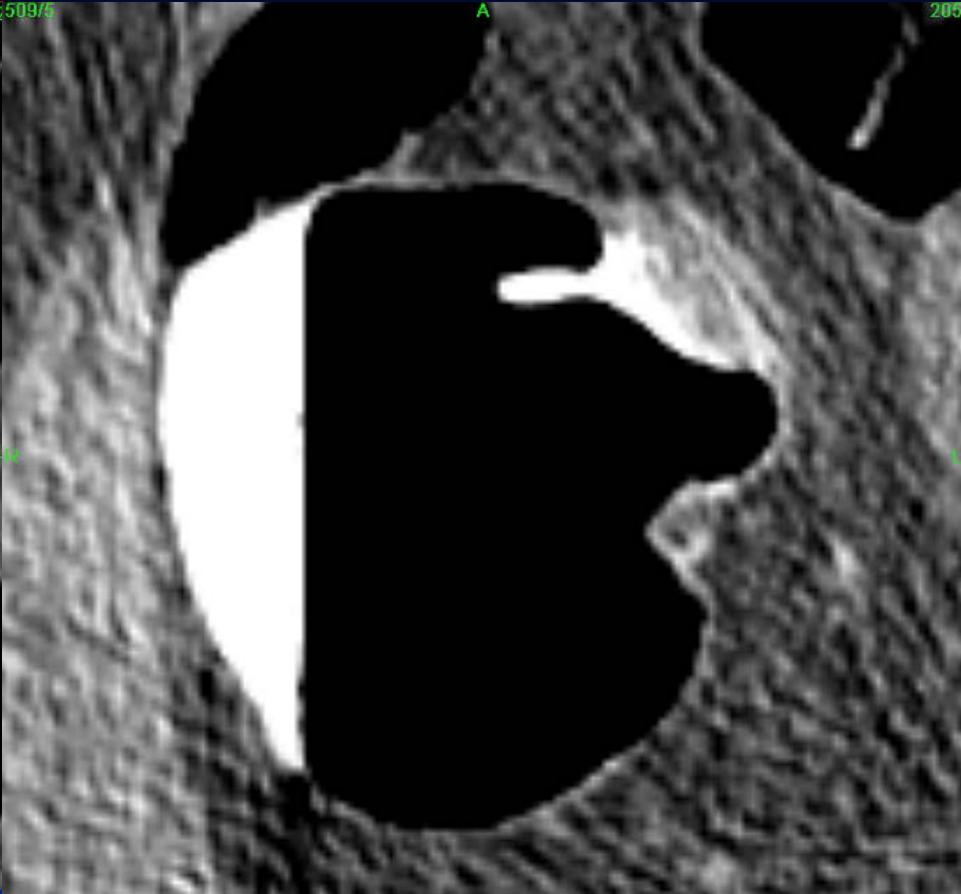
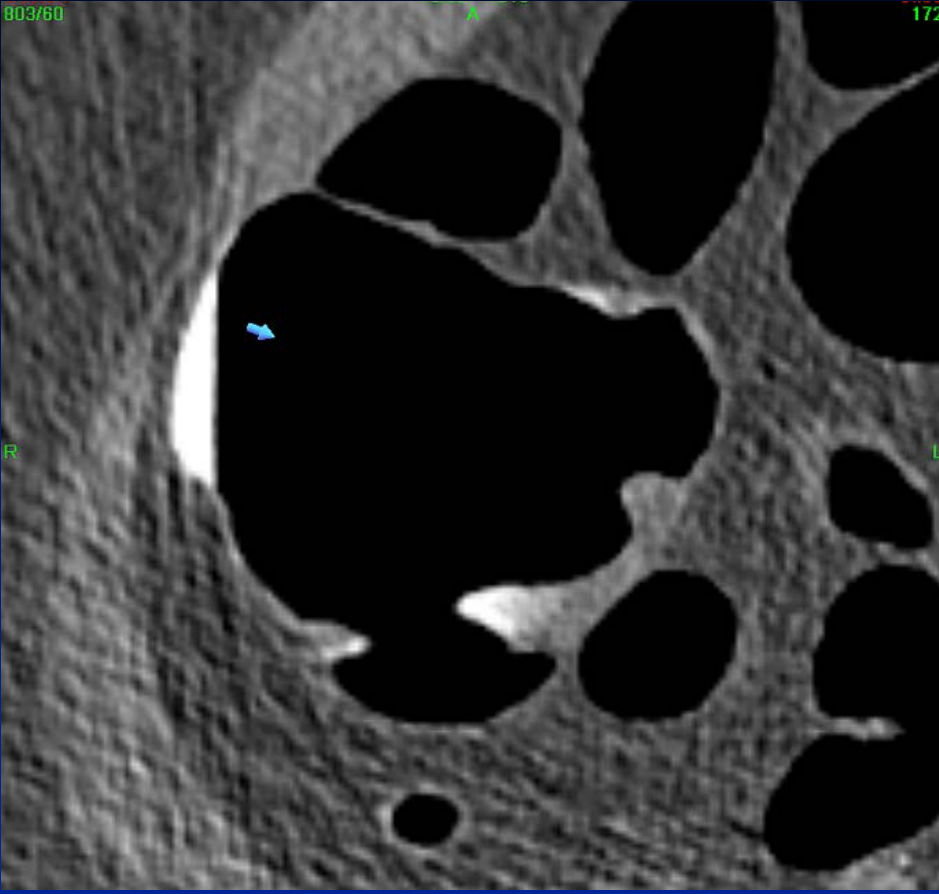


Asx Screening Exam

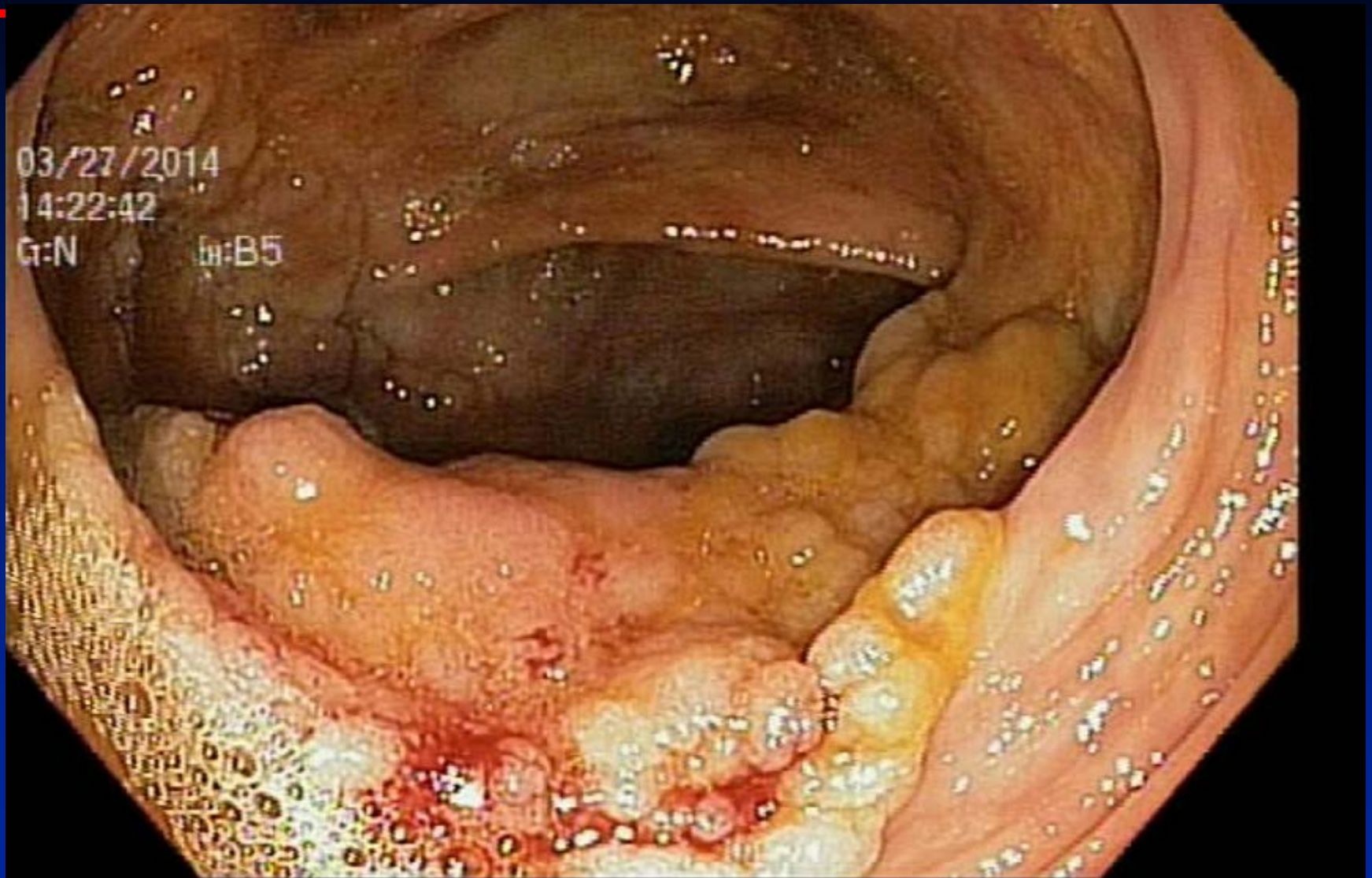
# 6.5 cm Carpet Lesion Cecum



# Right Lateral Decub



# Tubulovillous Adenoma



# NP-CRN –Take Home Message

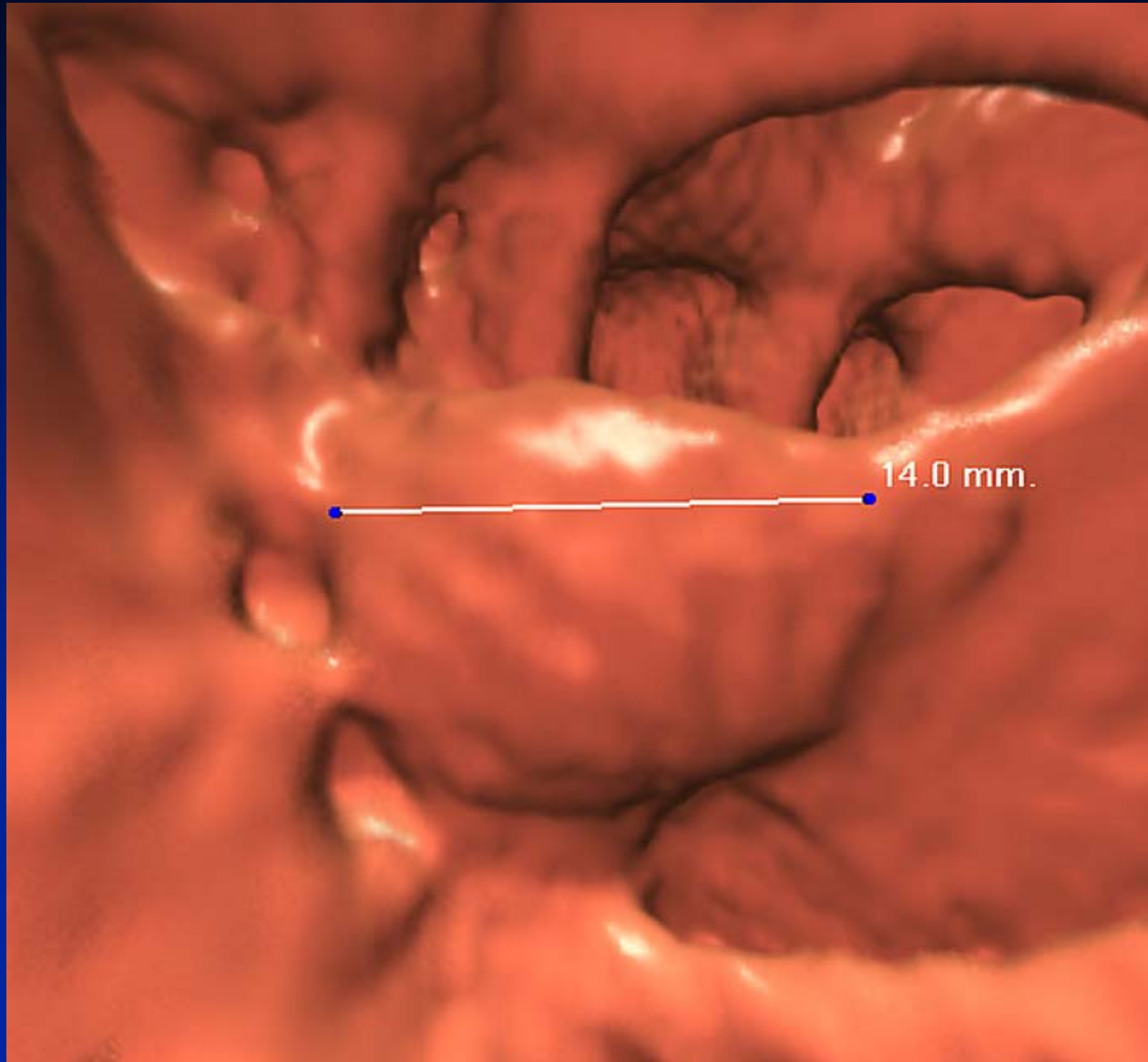
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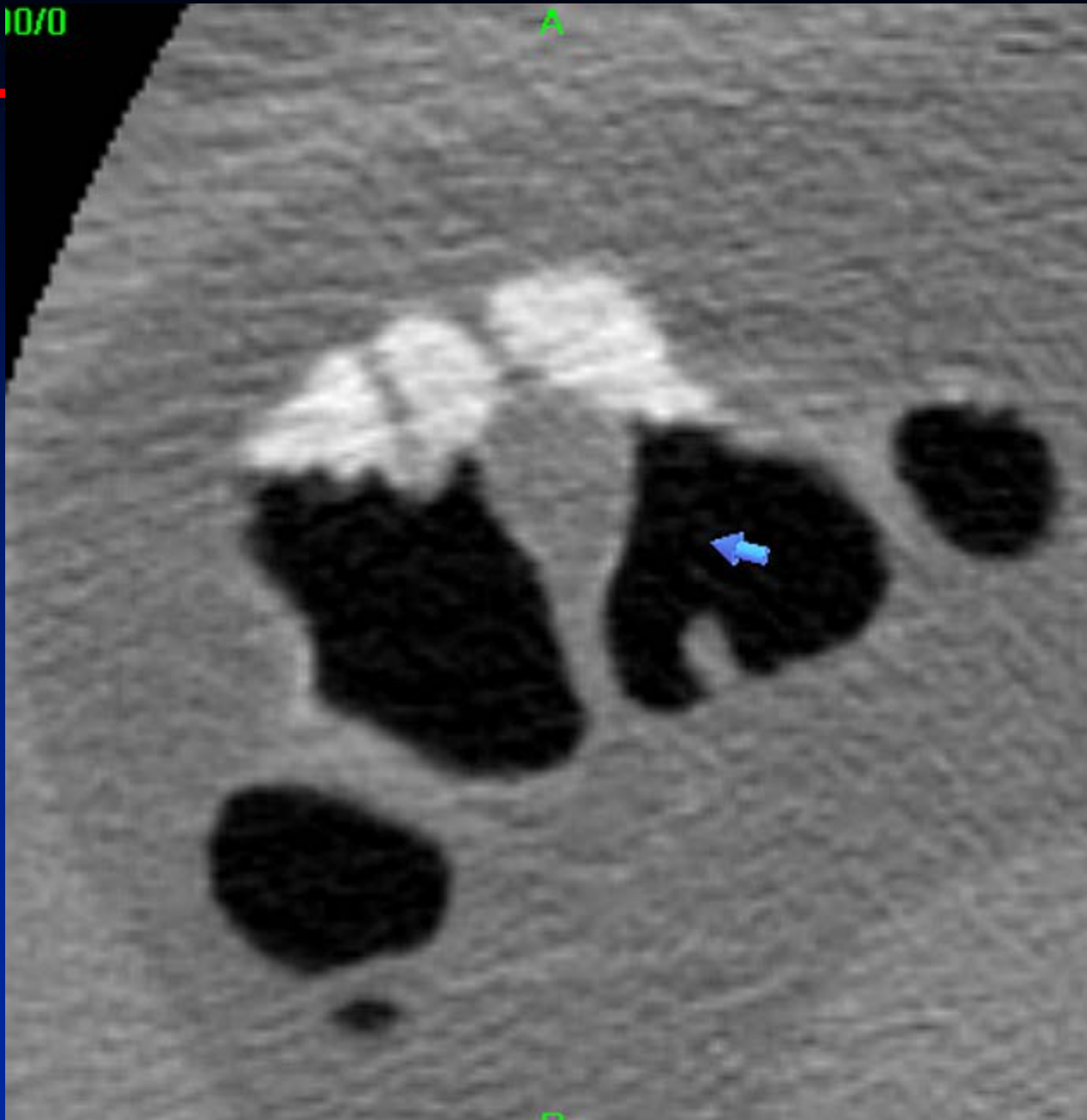
- ◆ Be aware of the potential for NP-CRN
- ◆ Prevalence and clinical significance in US remains to be fully defined
- ◆ Detection more challenging than polypoid neoplasia and requires meticulous technique
- ◆ Good sensitivity for CTC detection with 3D and 2D soft tissue windows
- ◆ CAD may be helpful as algorithms are refined

# Submucosal Lesions

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- ◆ Some superficial submucosal lesions can't be differentiated from mucosal lesions at CTC
- ◆ OC readily differentiates mucosal lesions from those deep to the mucosa
- ◆ Useful to characterize OC detected potential “lesions” as truly submucosal vs. extrinsic, and confirm indeterminate OC lesions as lipomas
- ◆ Smooth broad-based lesions with obtuse angles to colon wall
- ◆ +/- Exoenteric growth

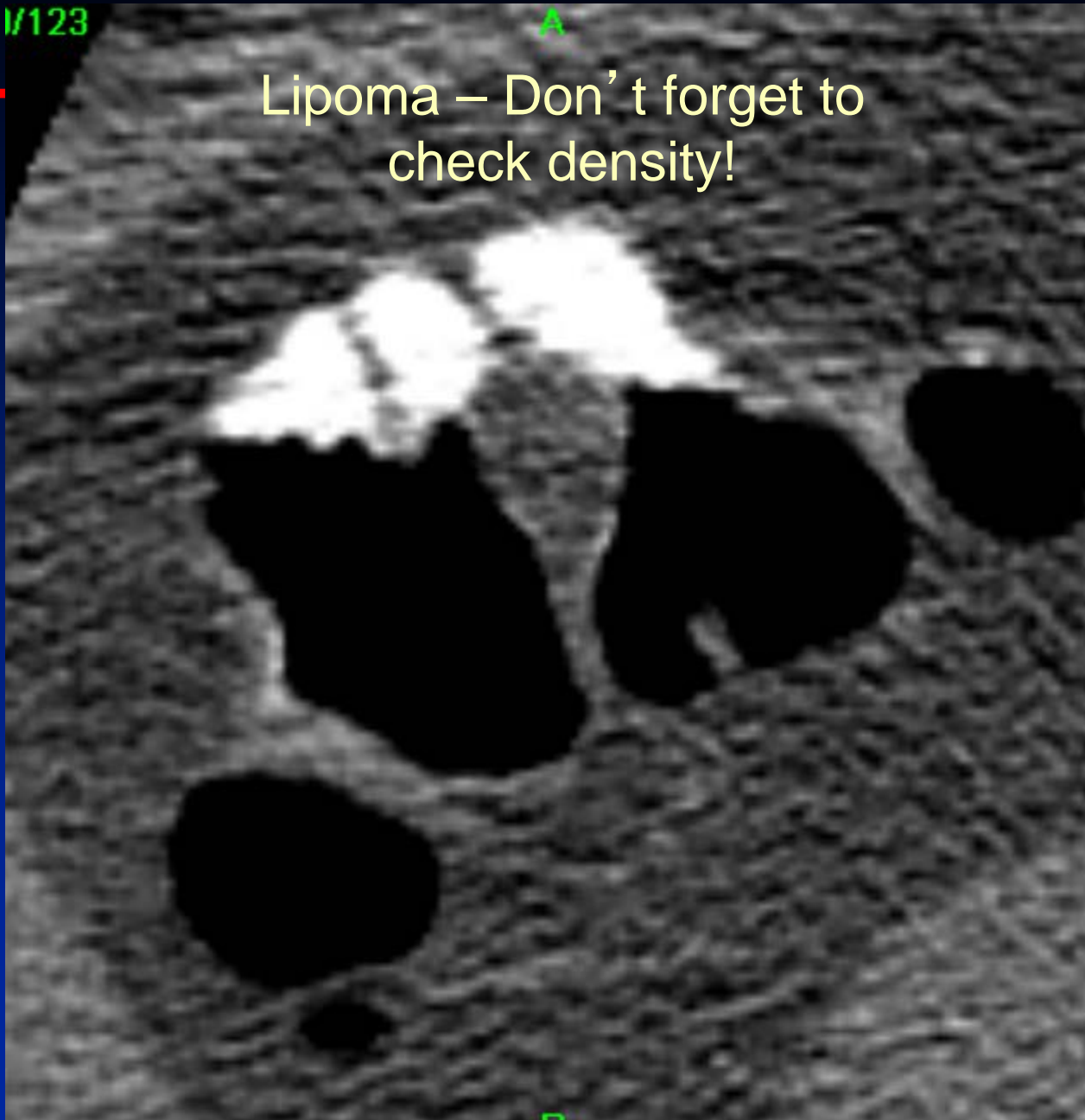




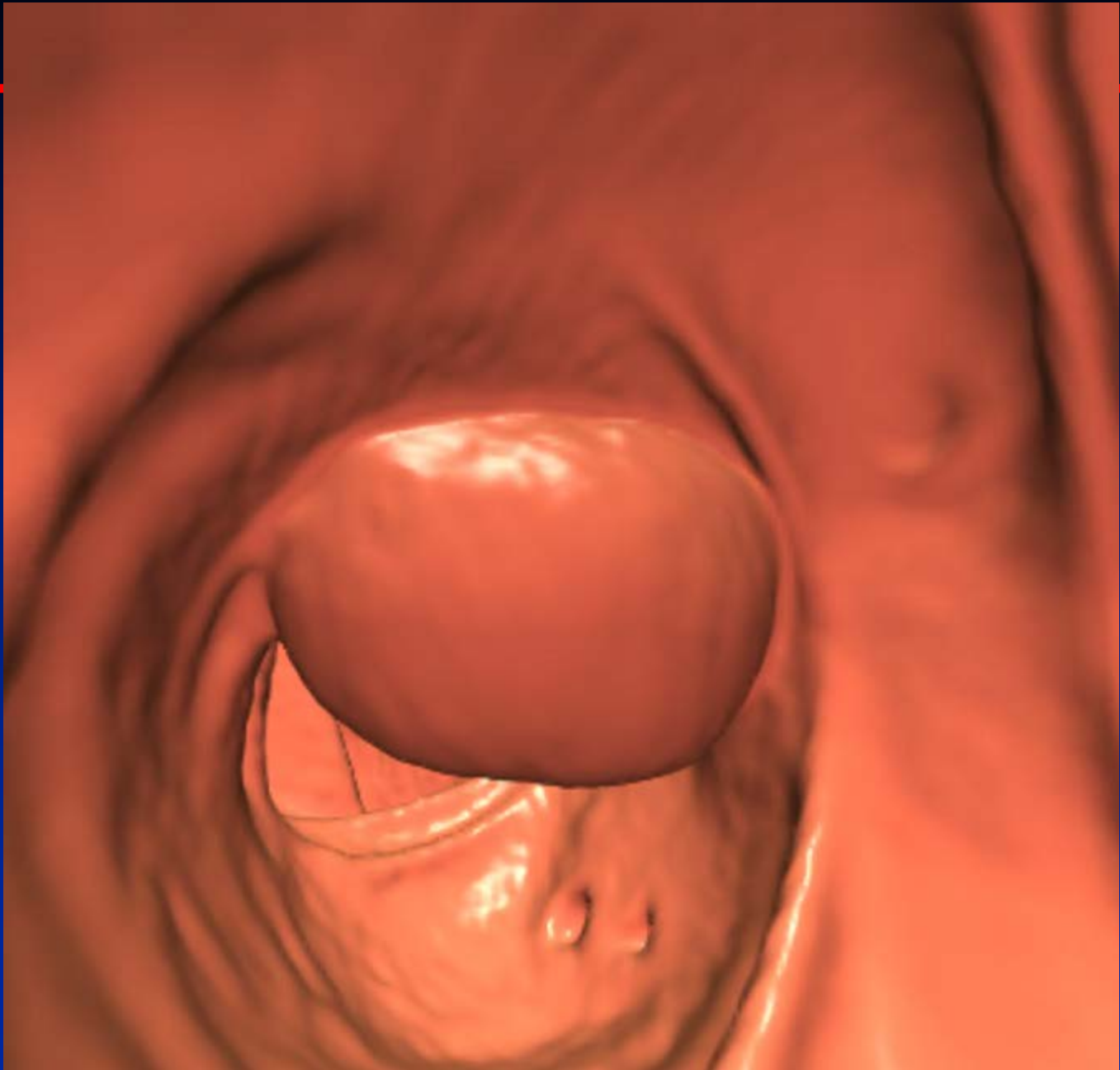
W123

A

Lipoma – Don't forget to  
check density!



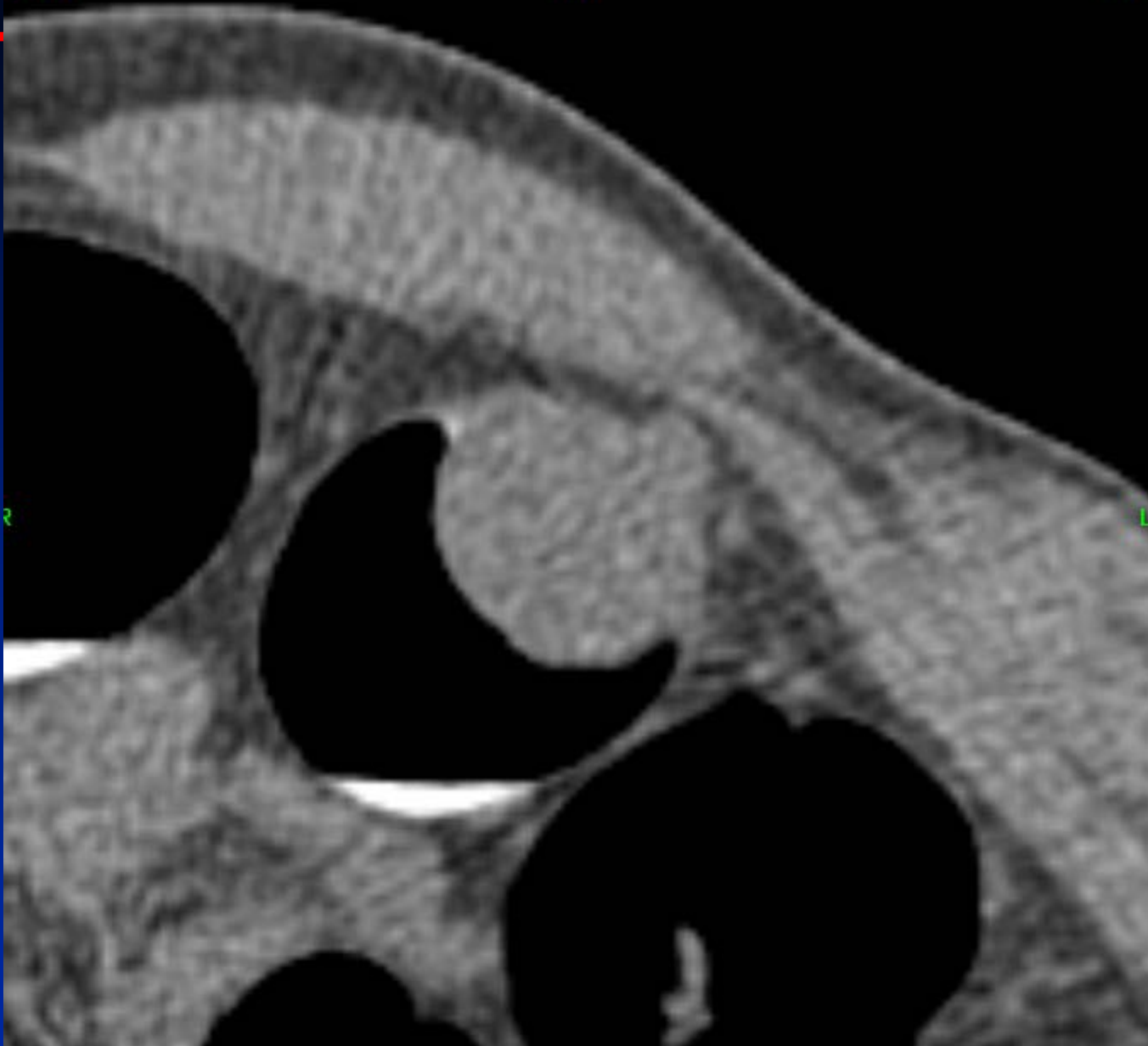
B



Custom  
i22/41

Value: --  
A

Slice  
263



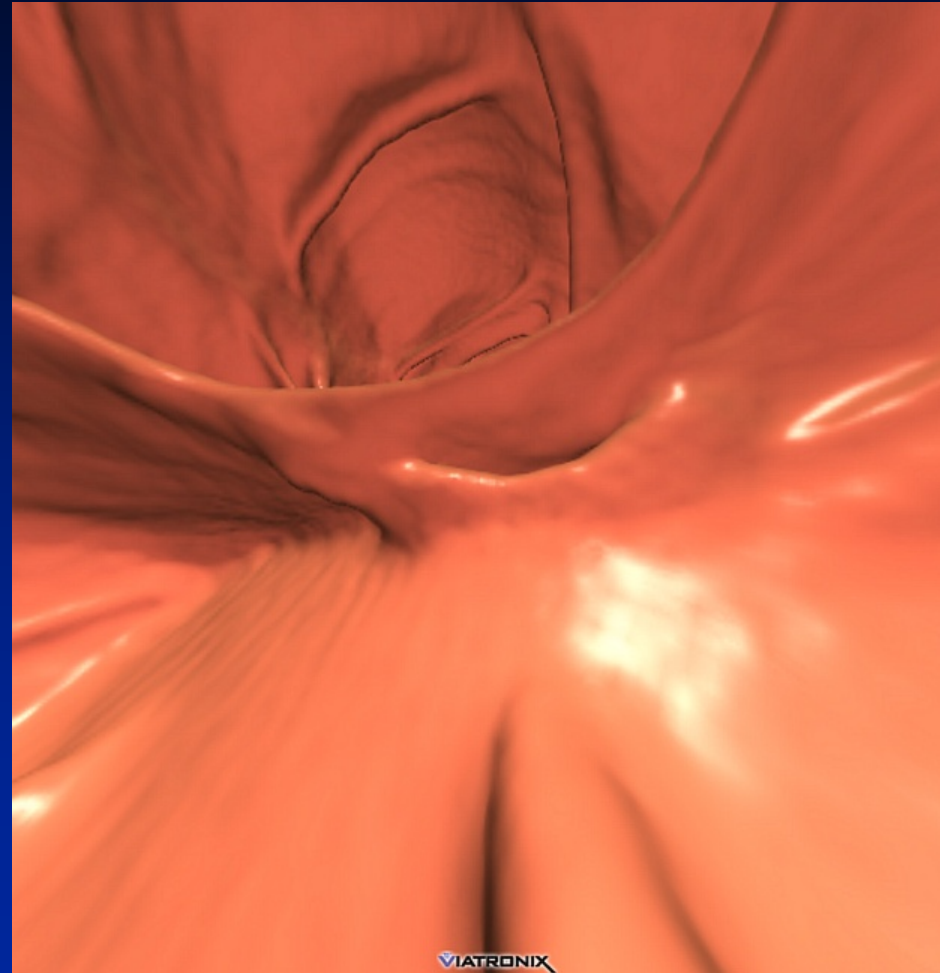
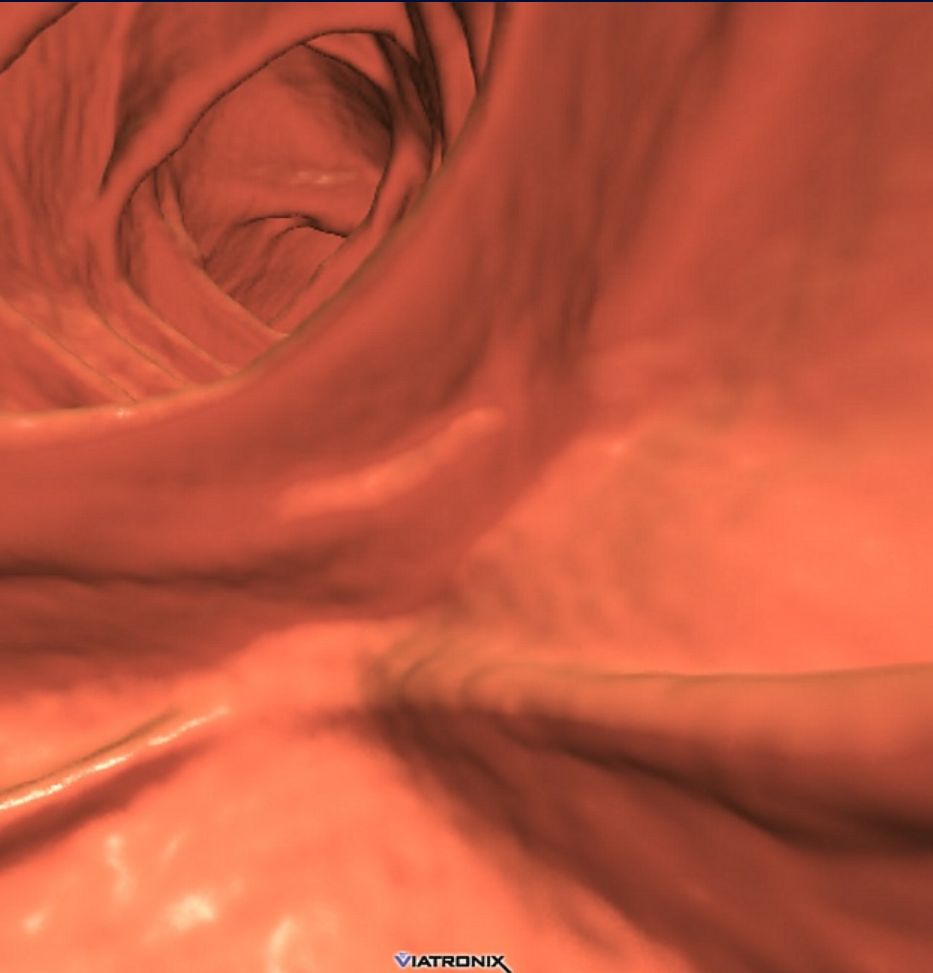
# Ileocecal Valve

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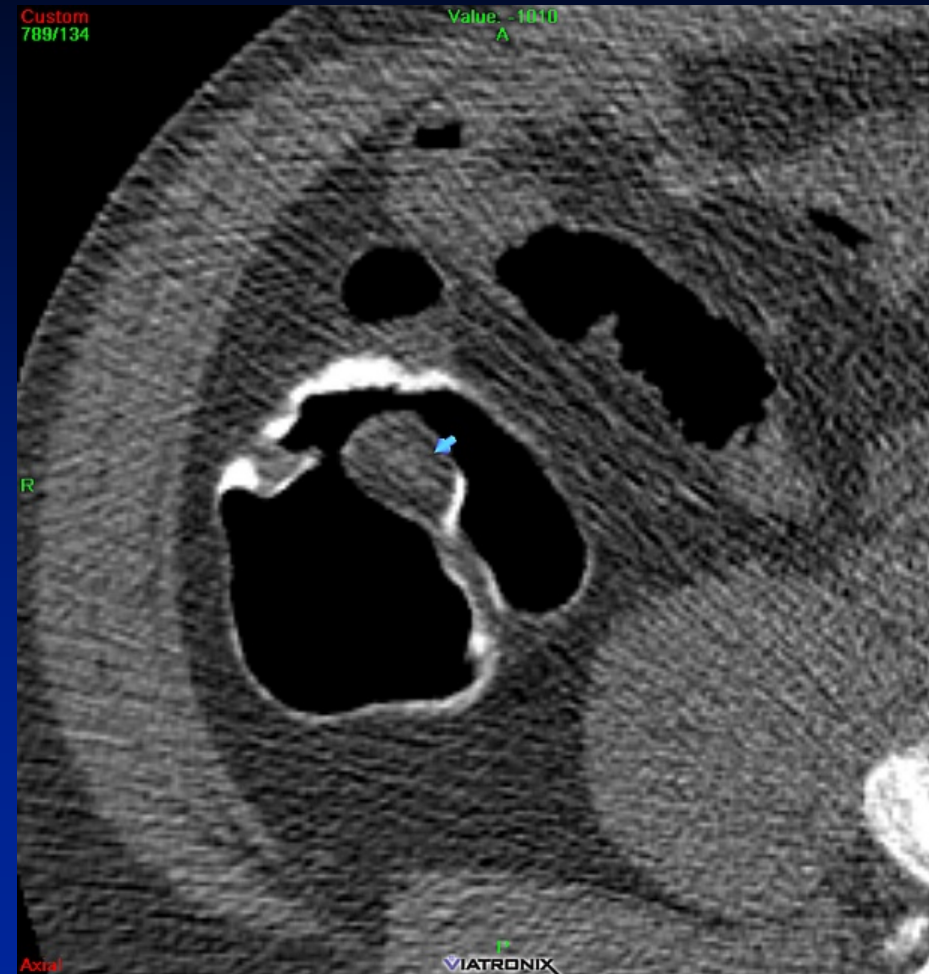
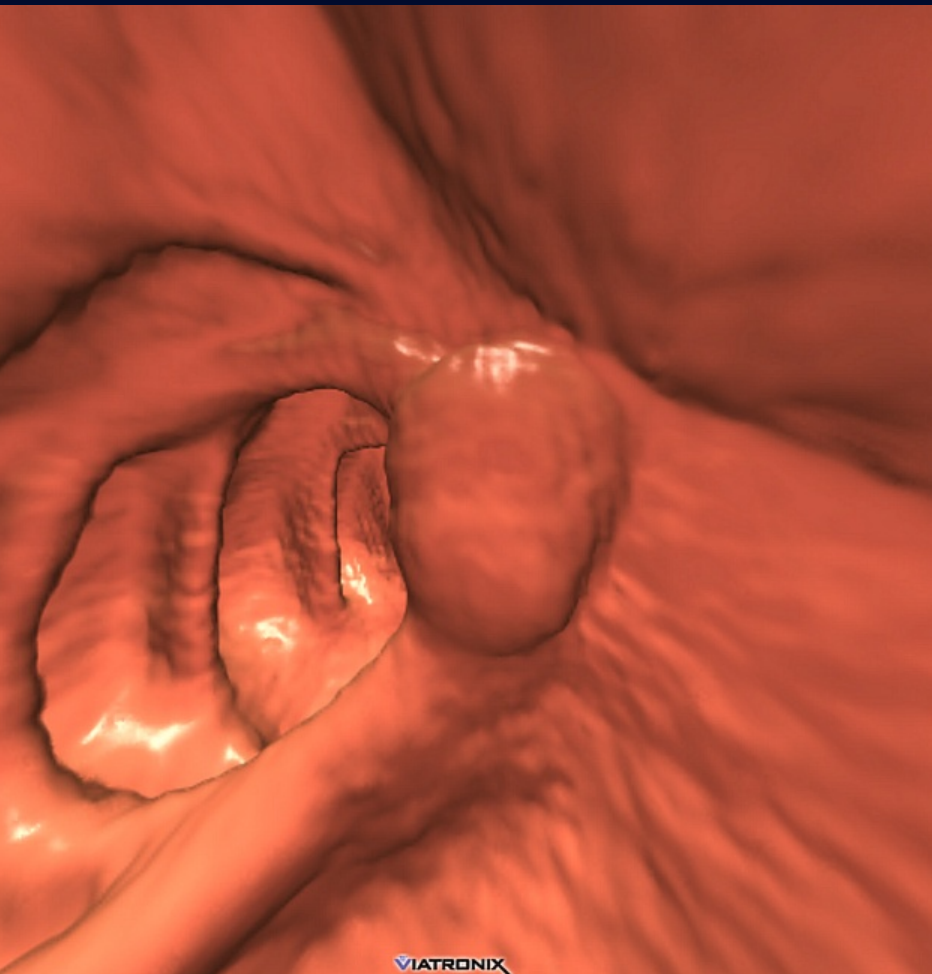
- ◆ Variable Appearance
  - Labial – most common
  - Papillary (with or without central depression)
  - Mixed
- ◆ Identify IC valve in every case
- ◆ Look for any areas of asymmetric soft tissue density – polyps occur on the IC valve

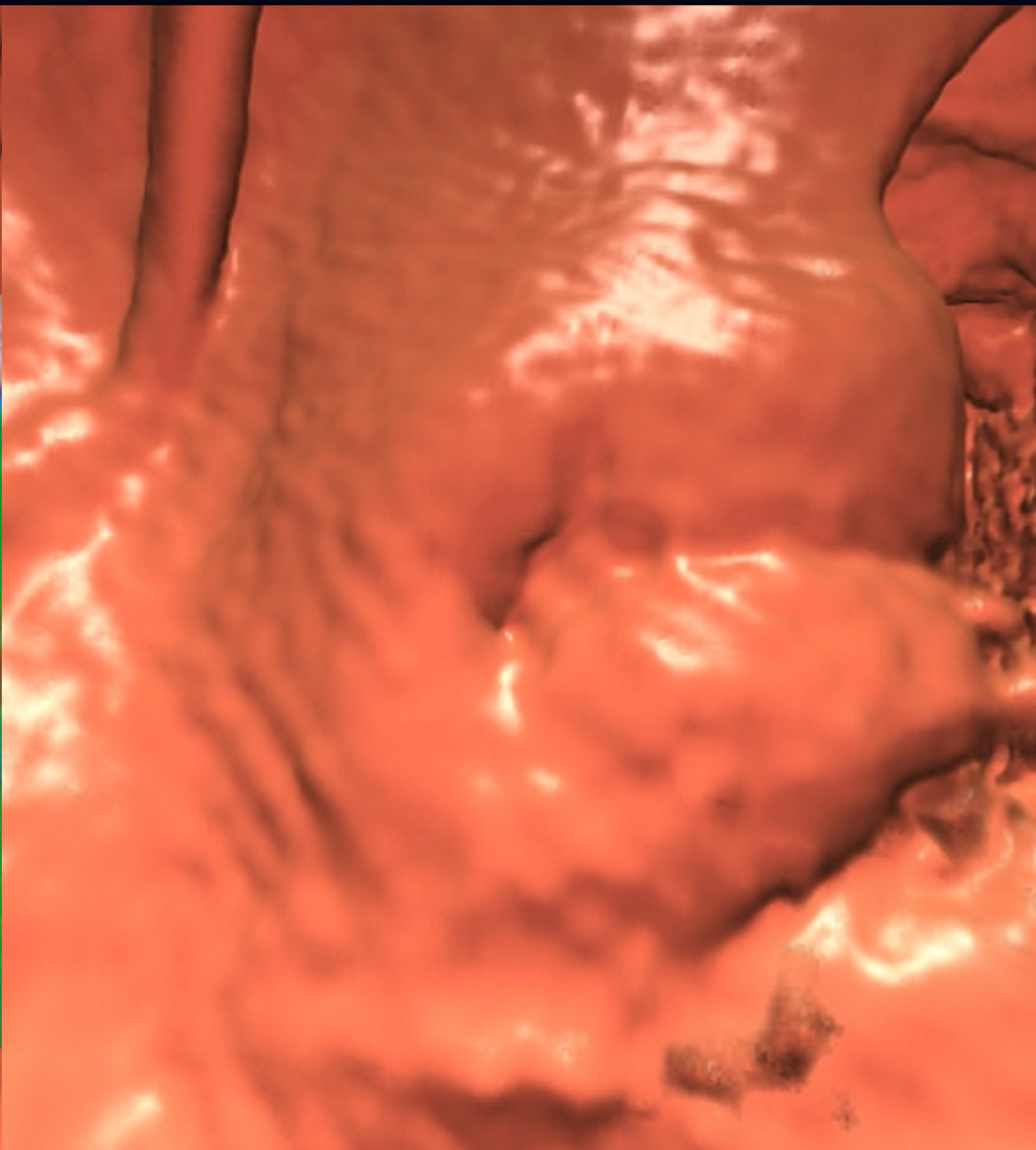
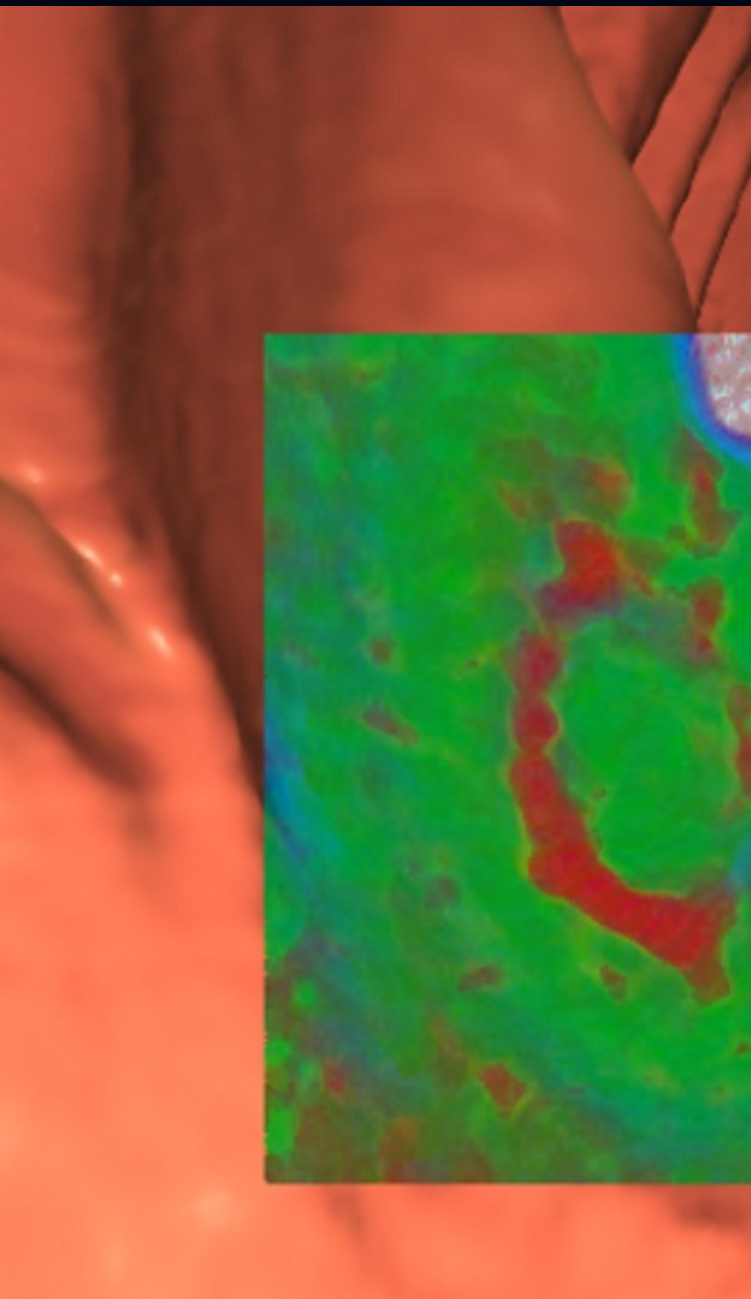
# Labial appearance of ICV

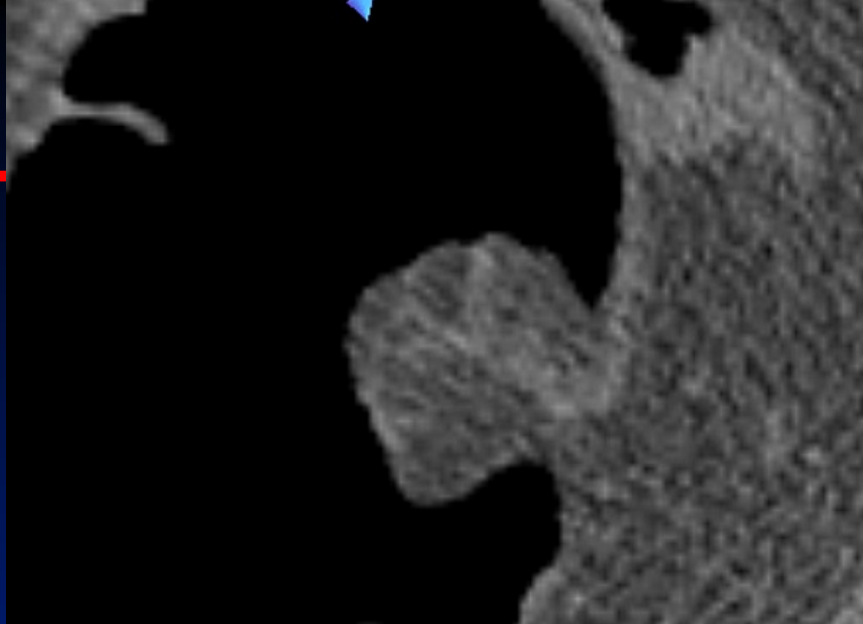
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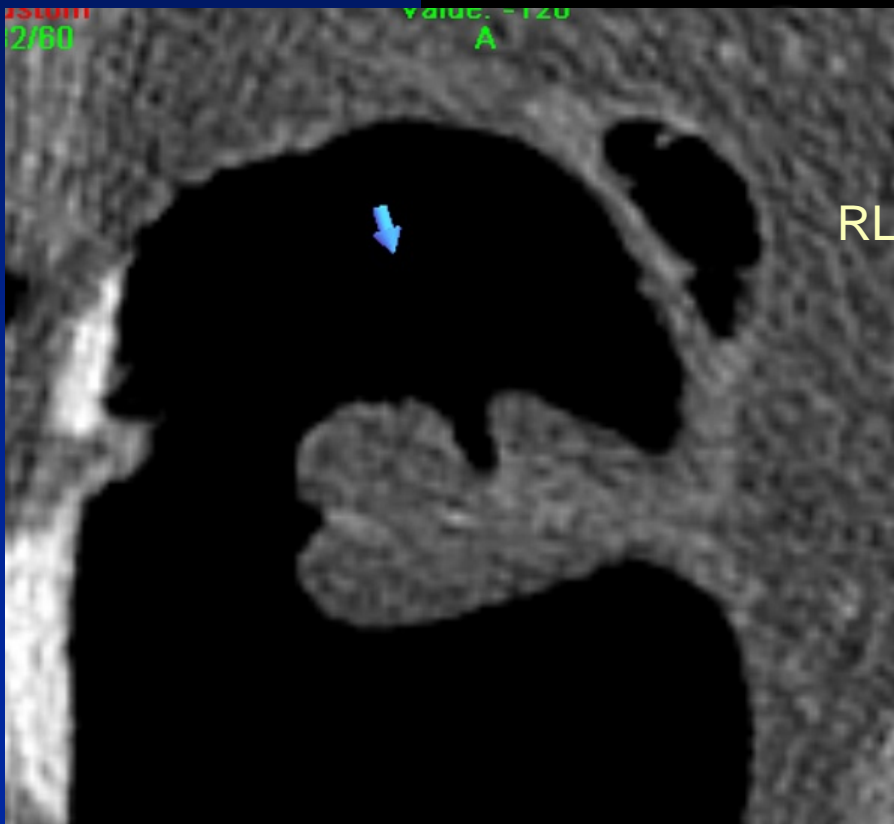
# Papillary appearance of ICV



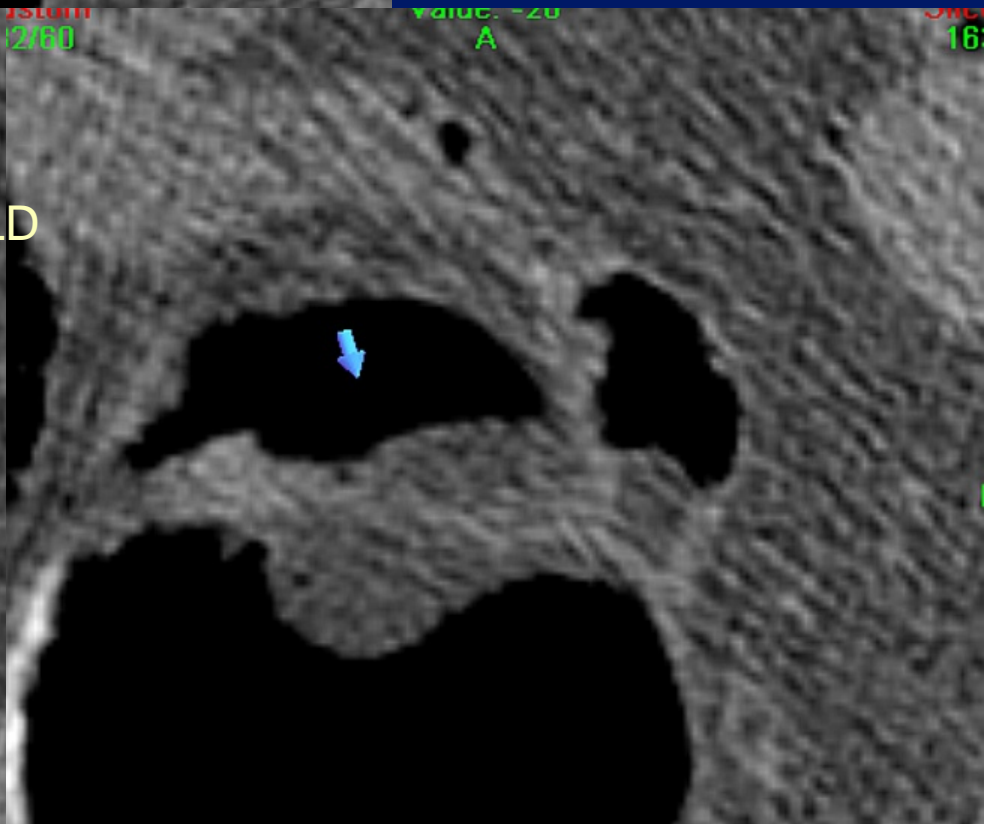




Supine



RLD

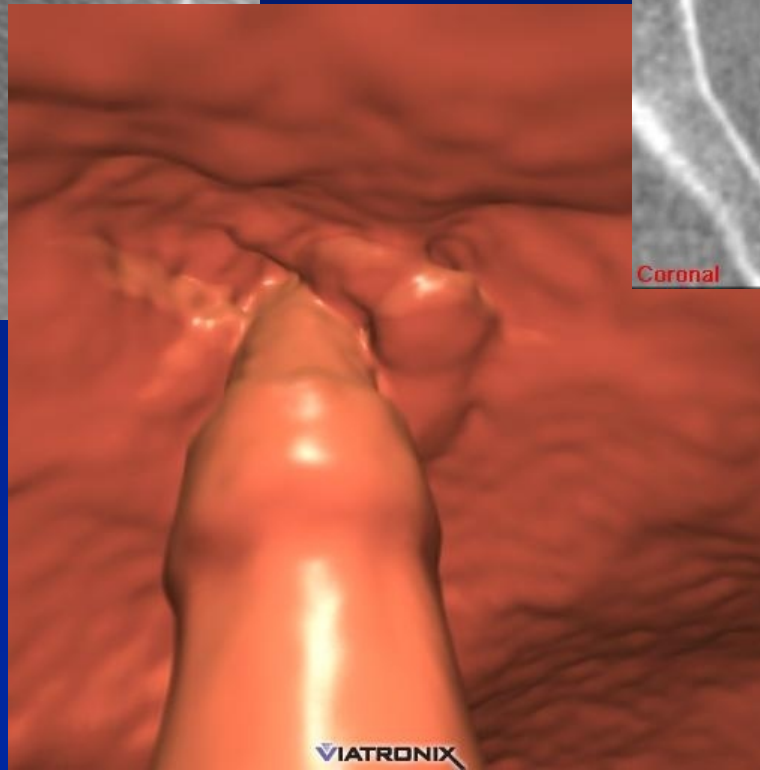
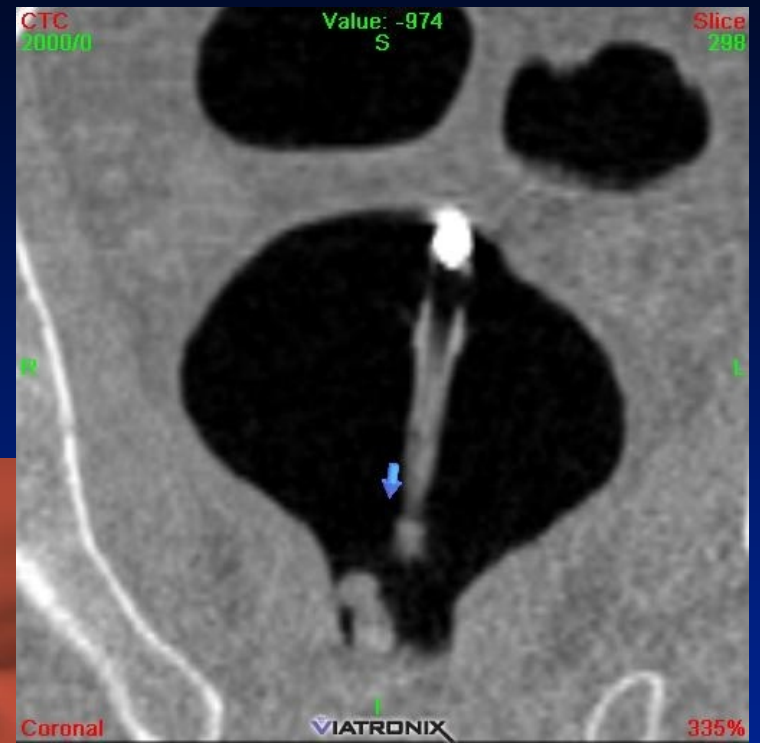
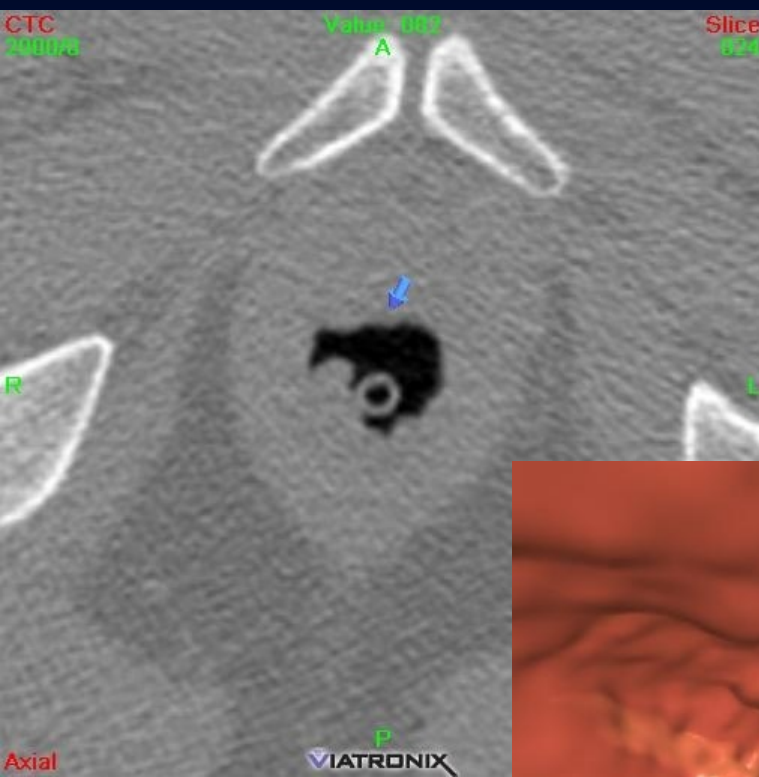


# Anal Verge

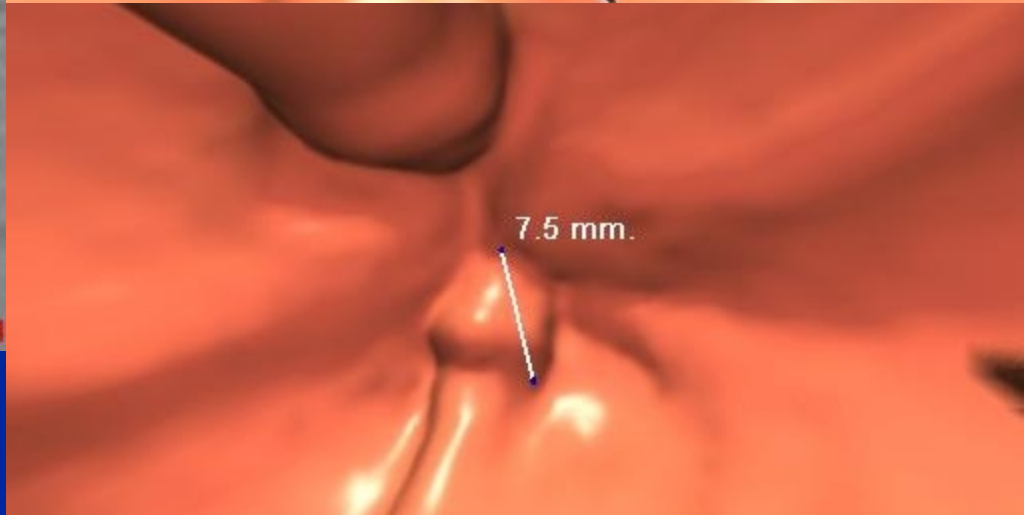
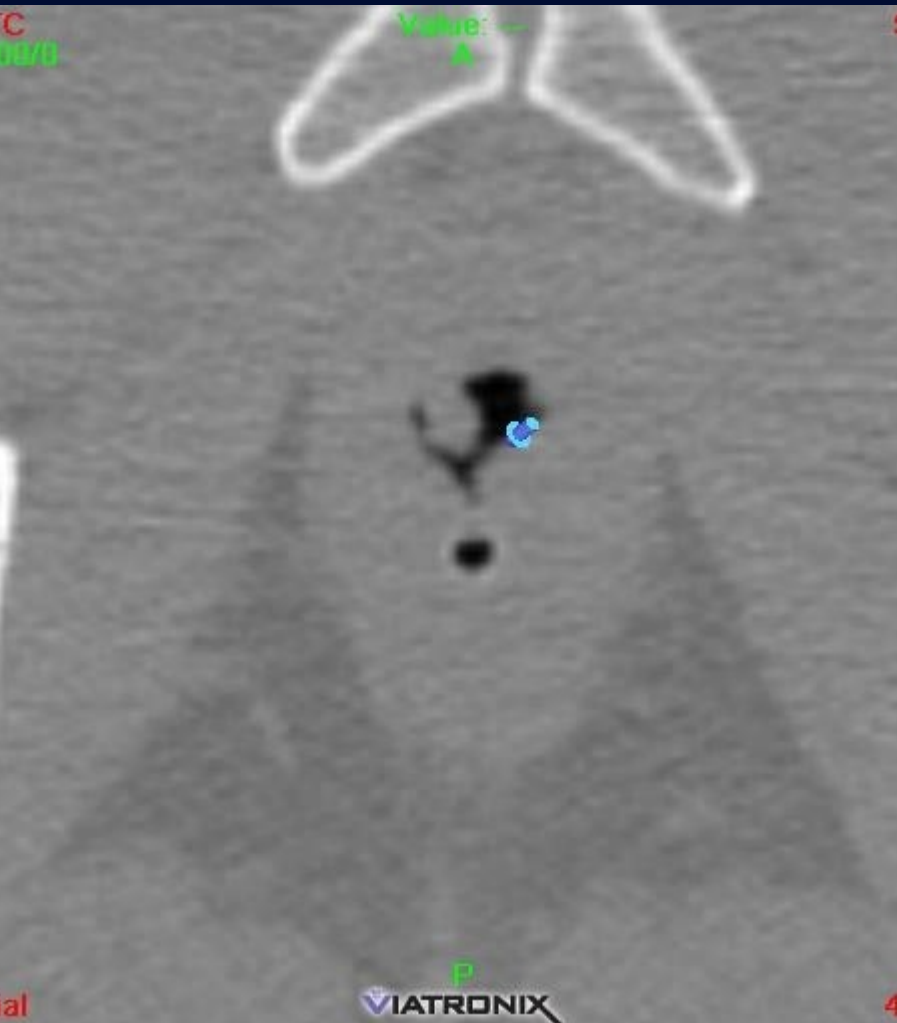
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- ◆ Always perform focused 2D evaluation and pay close attention to rectal wall adjacent to balloon
- ◆ Beware of lesions typically found in this area difficult to differentiate from polyps
  - Hemorrhoids
  - Hypertrophied anal papilla
  - Anal condylomata
- ◆ Correlate with digital rectal exam/anoscopy

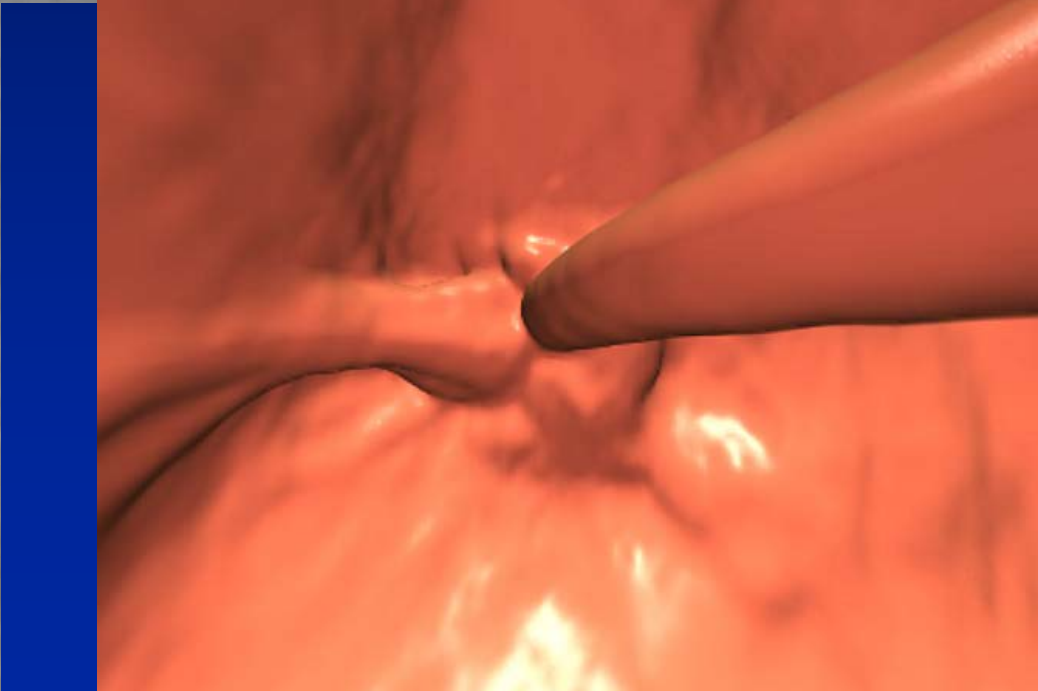
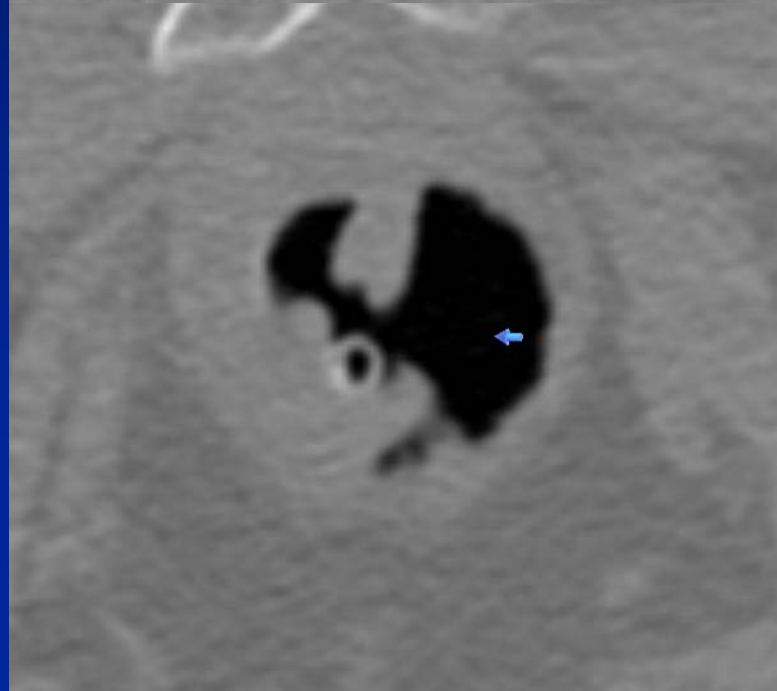
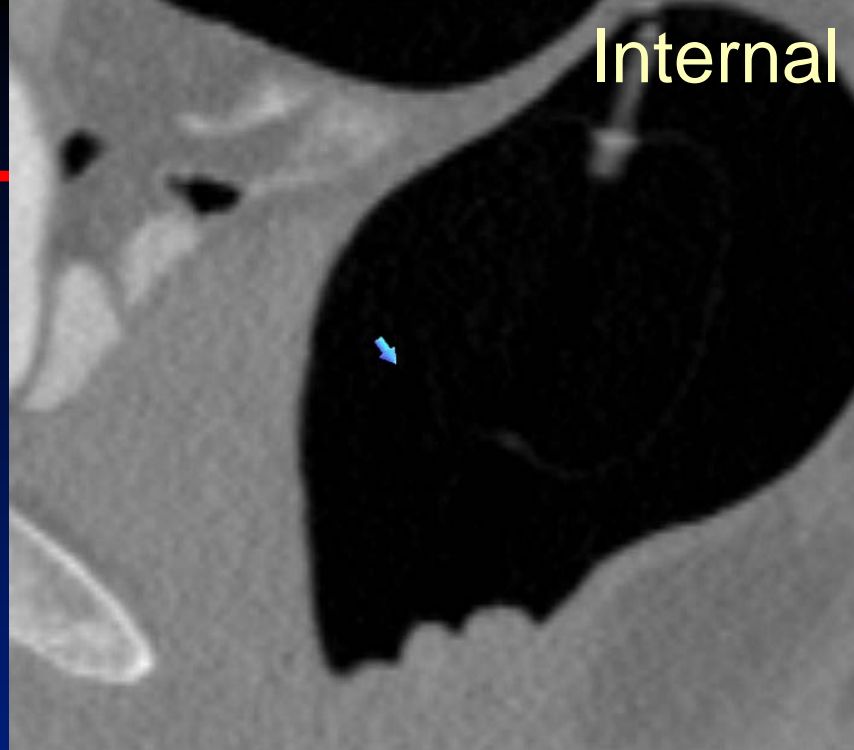
# Anal Condyloma

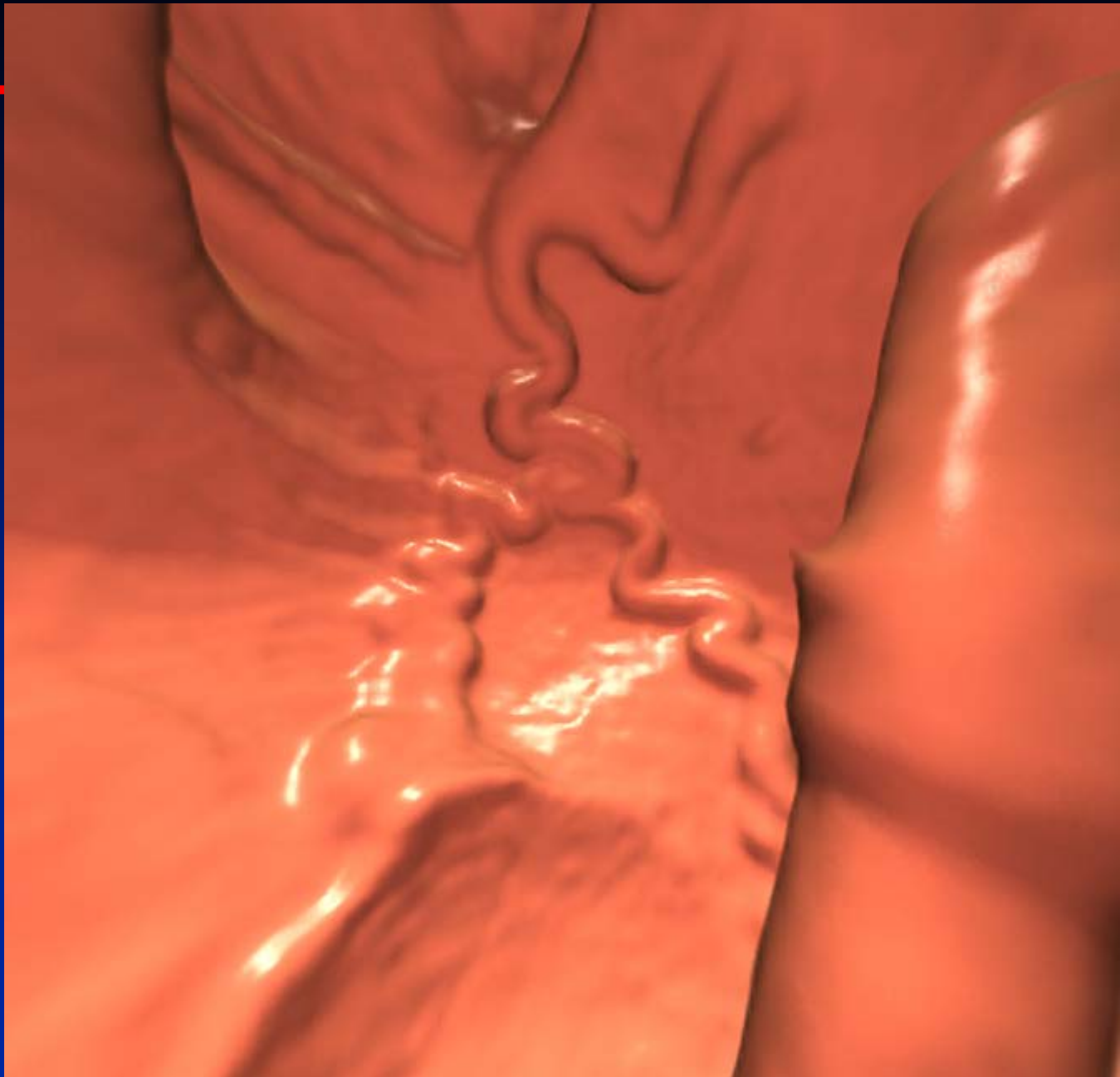


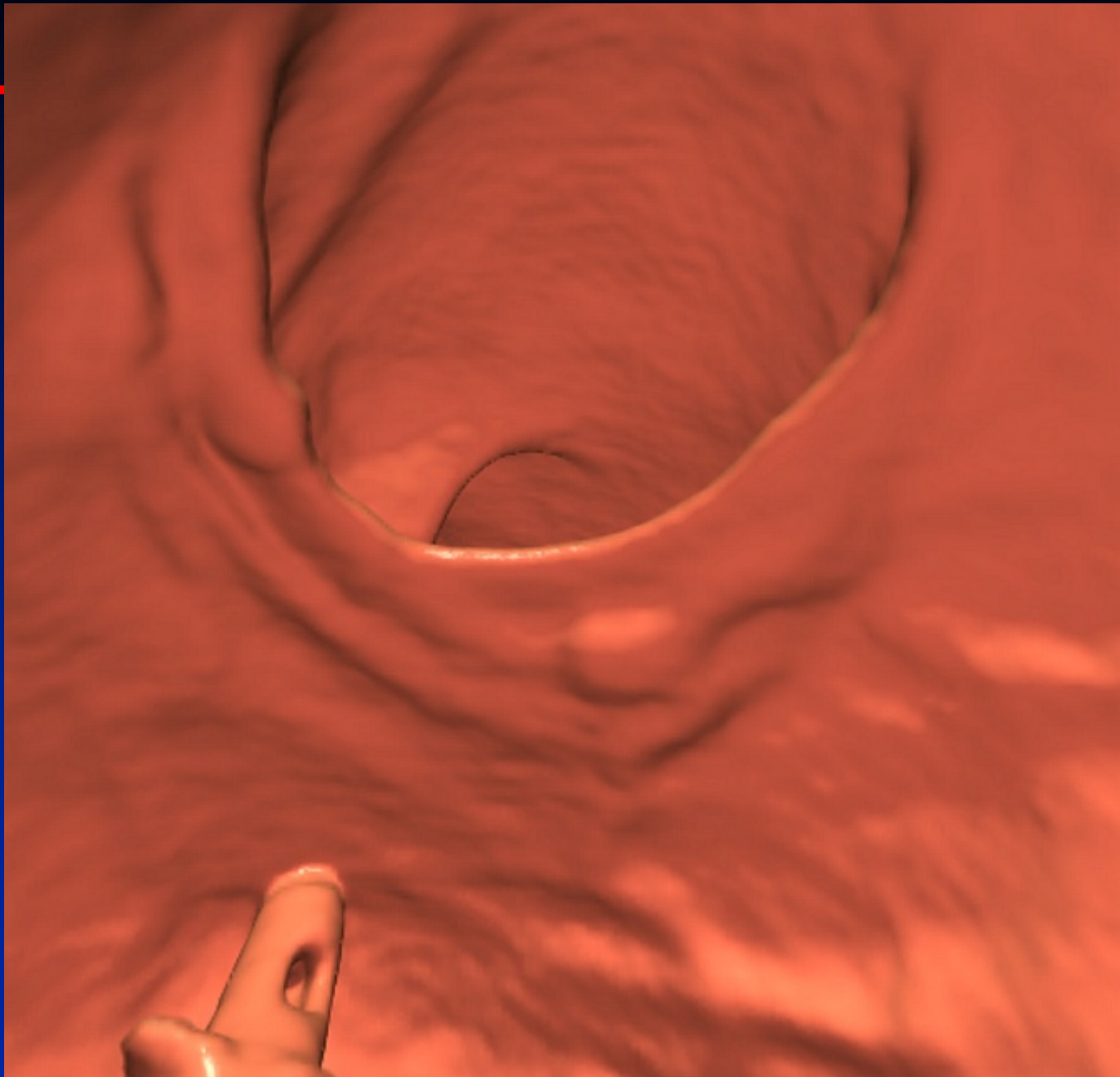
# Internal Hemorrhoid

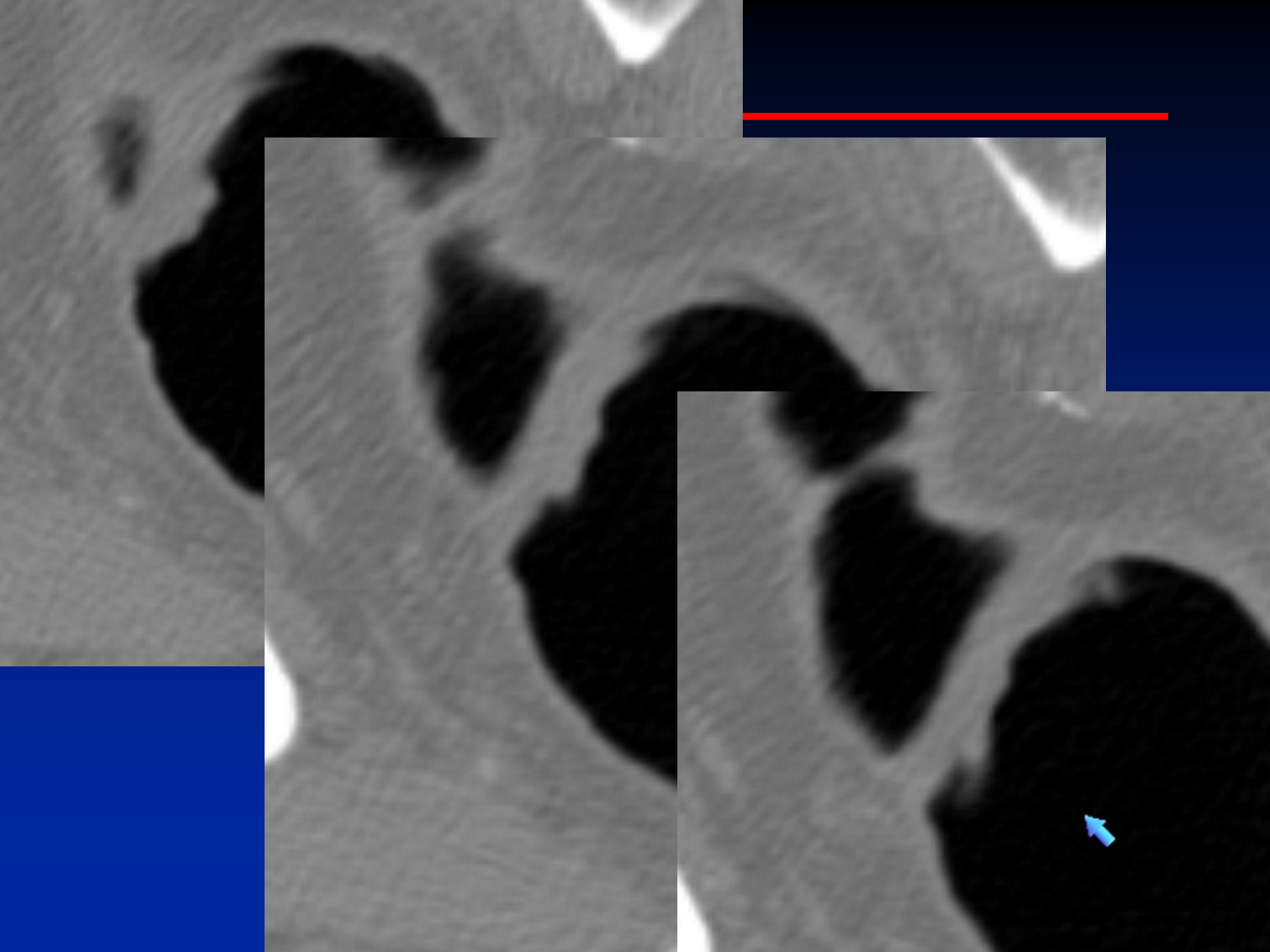


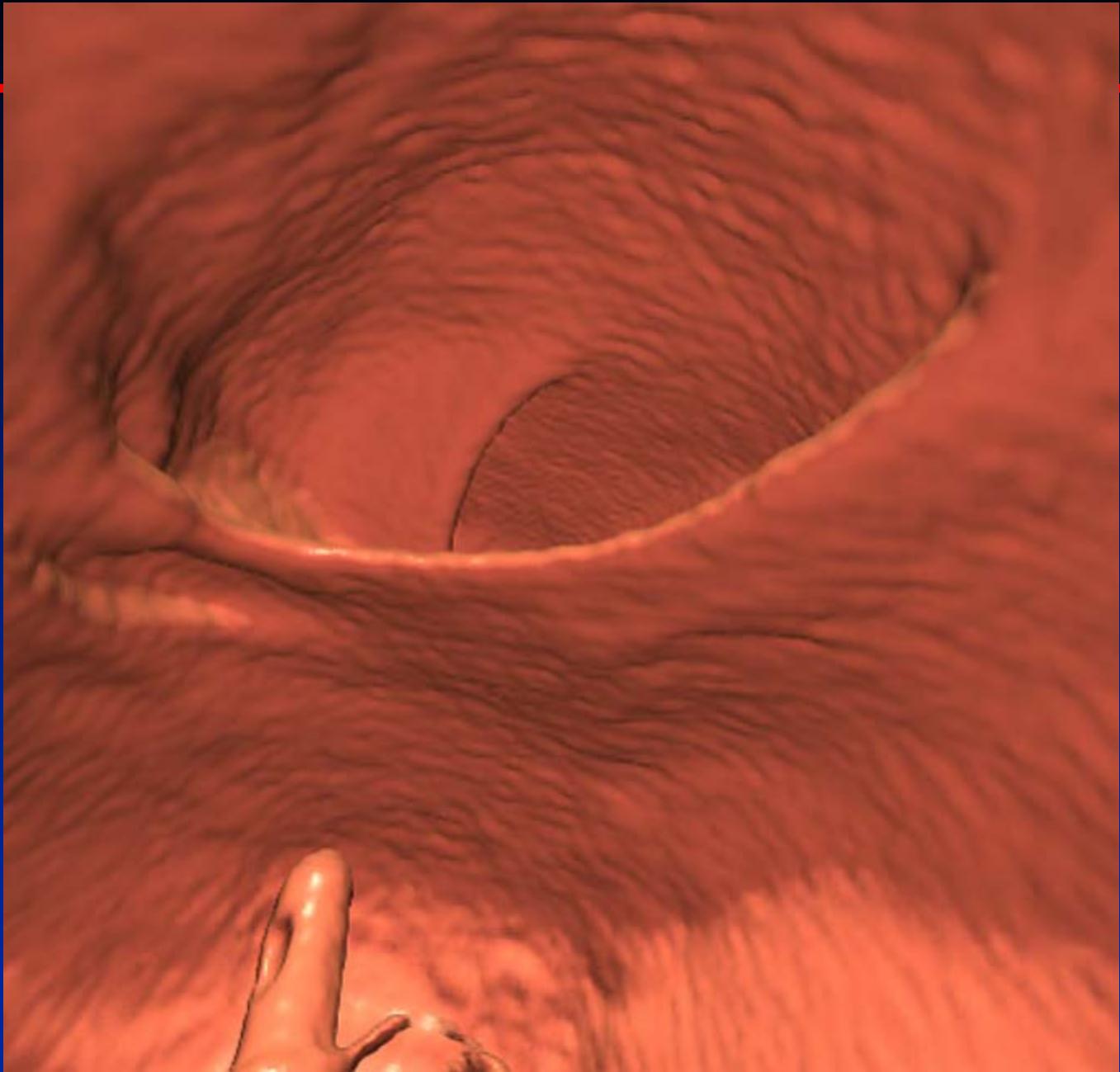
# Internal Hemorrhoid

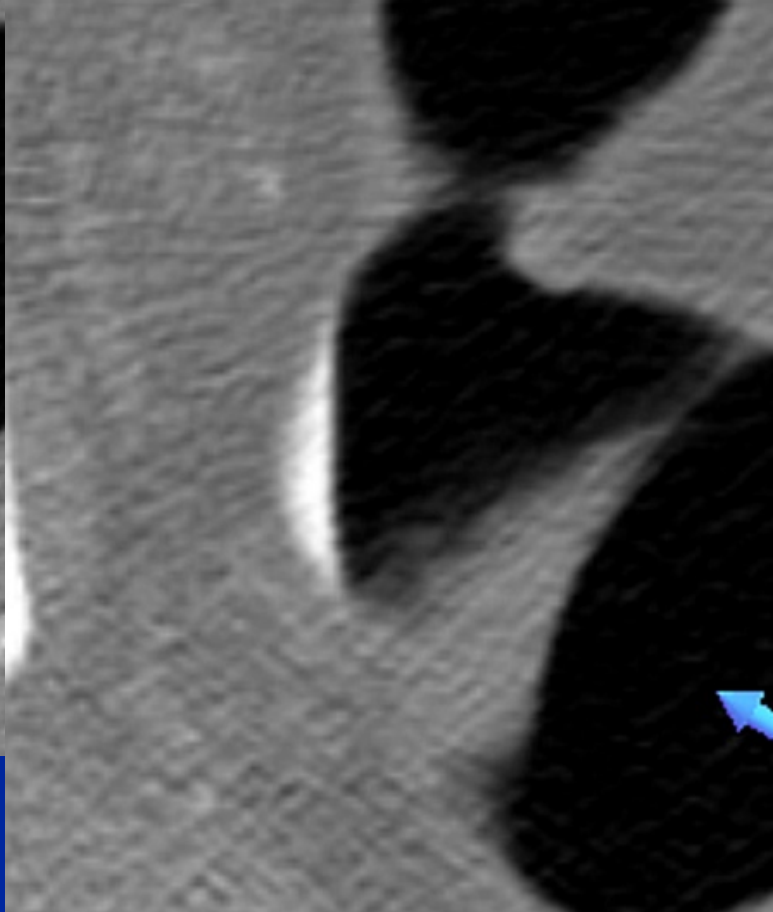
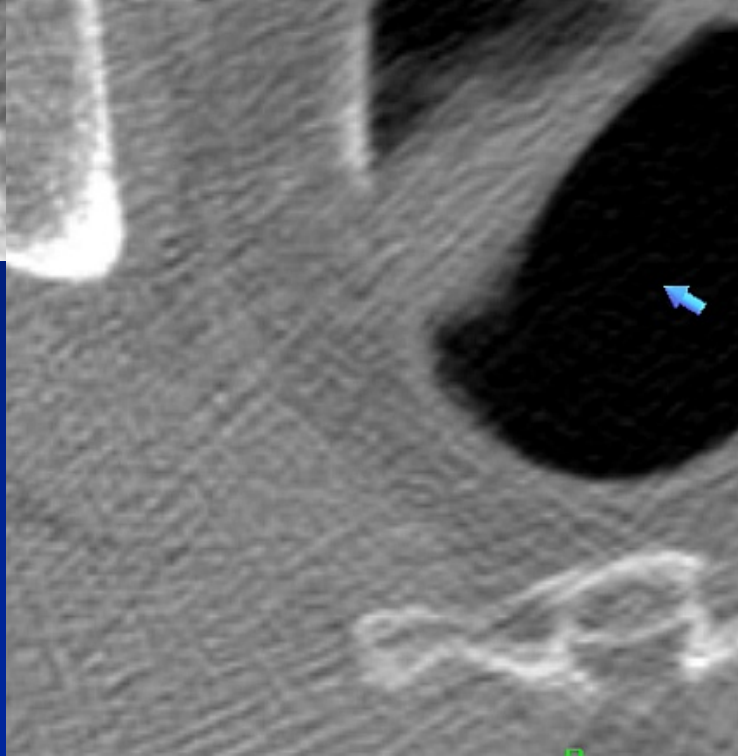
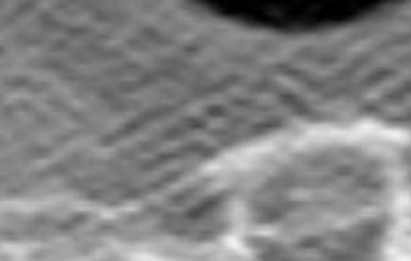
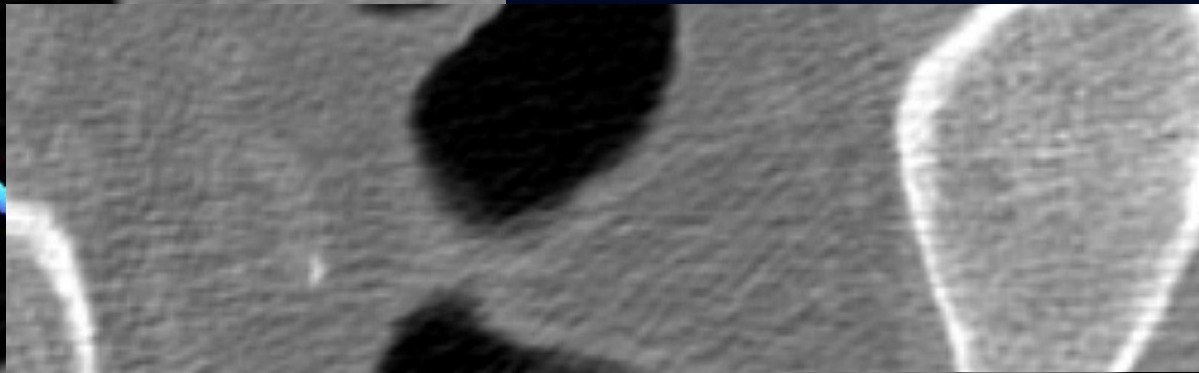




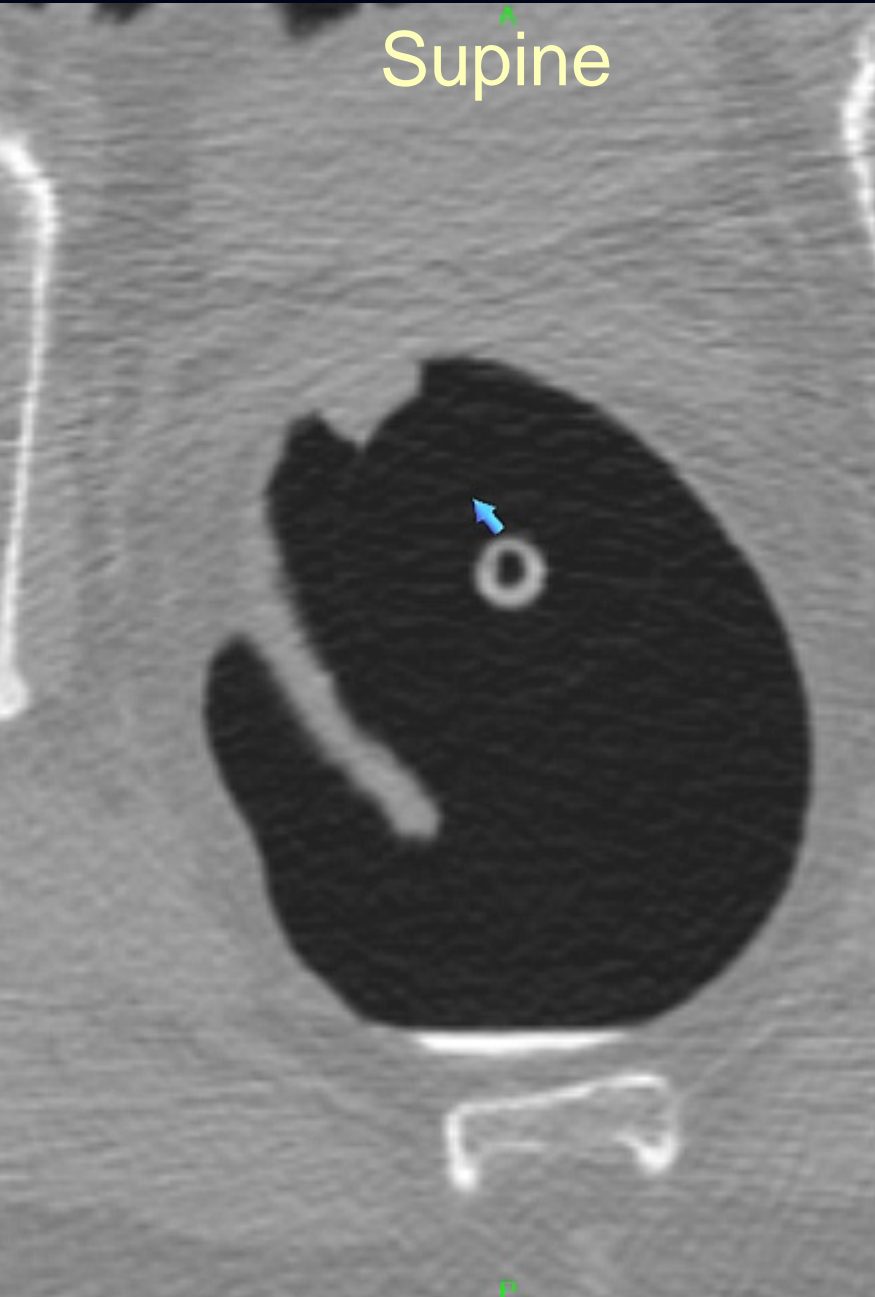




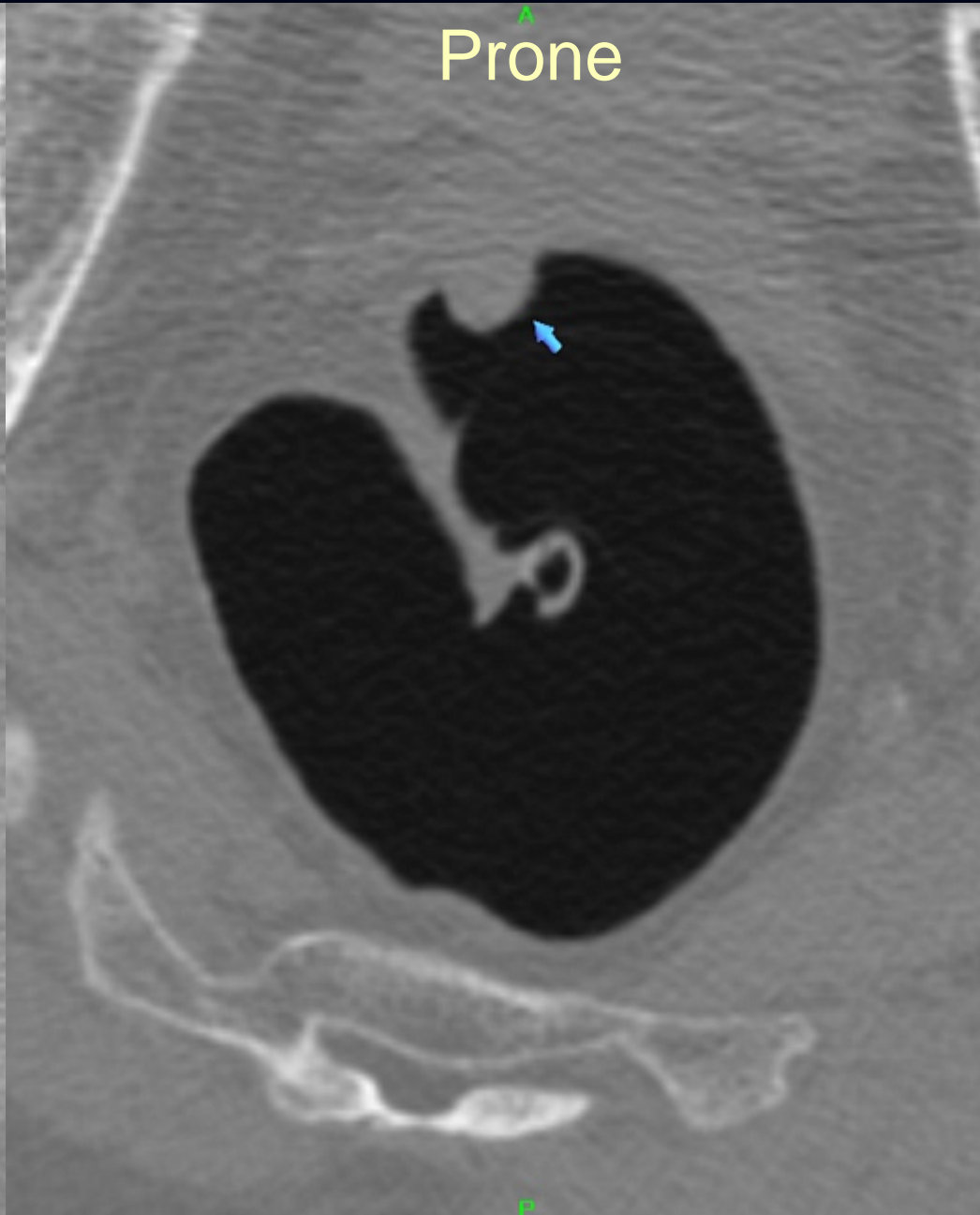




Supine



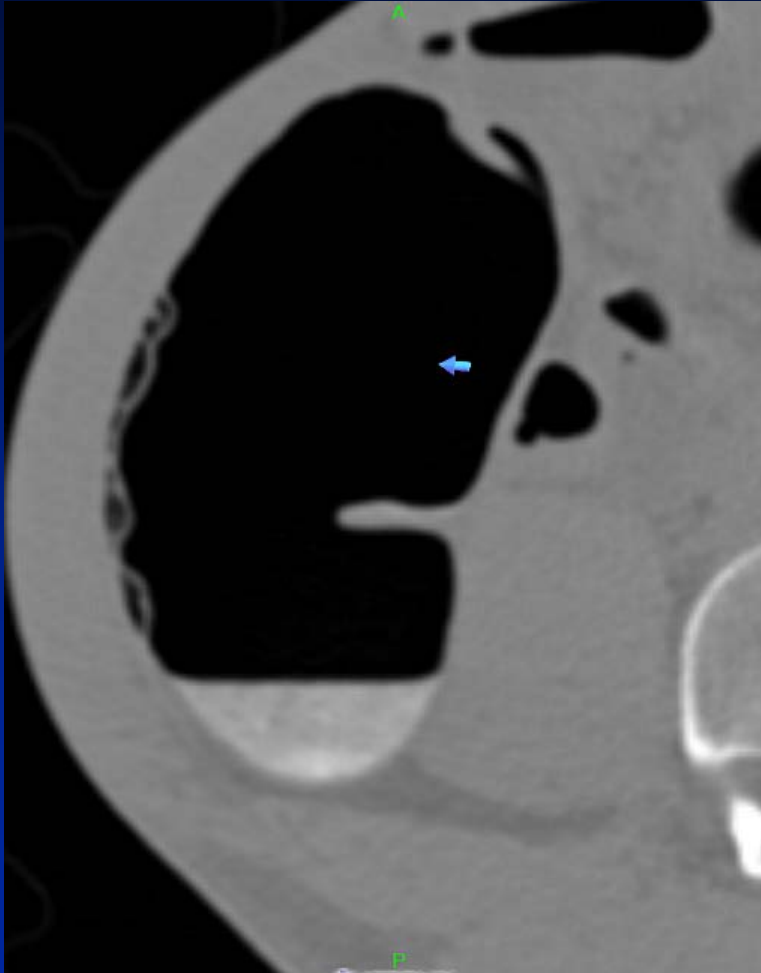
Prone



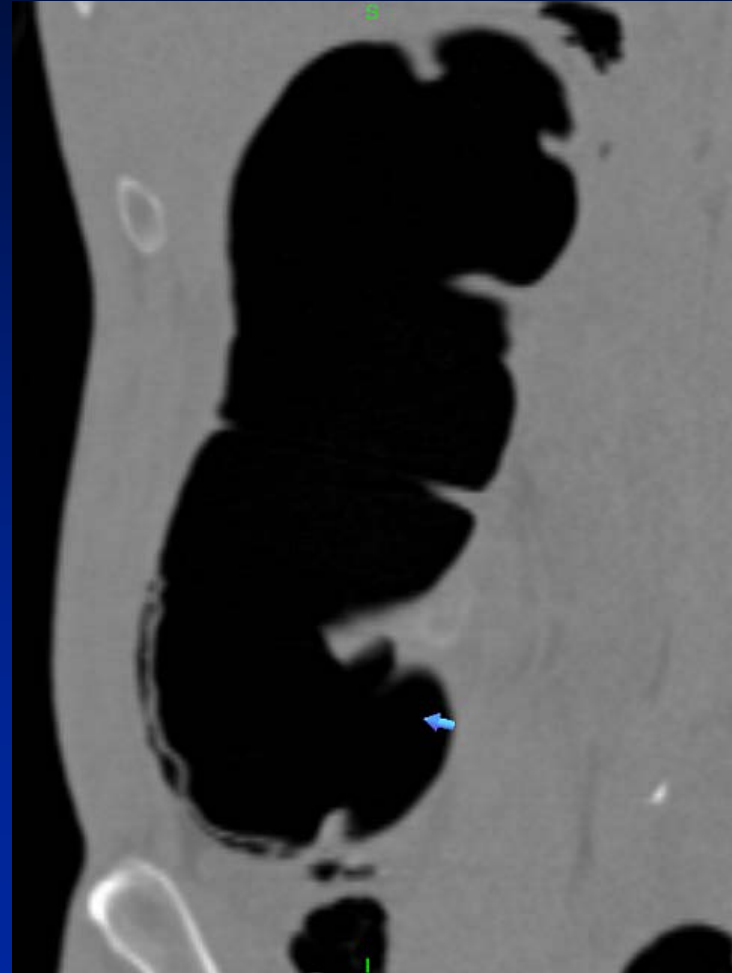
# Misc. – Asx Pneumatosis

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Axial



Coronal



# Summary

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- ◆ Interpretation
  - Density → Morphology → Mobility
- ◆ Combined 2D/3D review necessary with knowledge of the strengths and pitfalls of each method
- ◆ Careful attention to patient prep and scanning technique
- ◆ Look for NP-CRN
- ◆ Focused 2D review of rectum and cecum in every case

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Thank You!