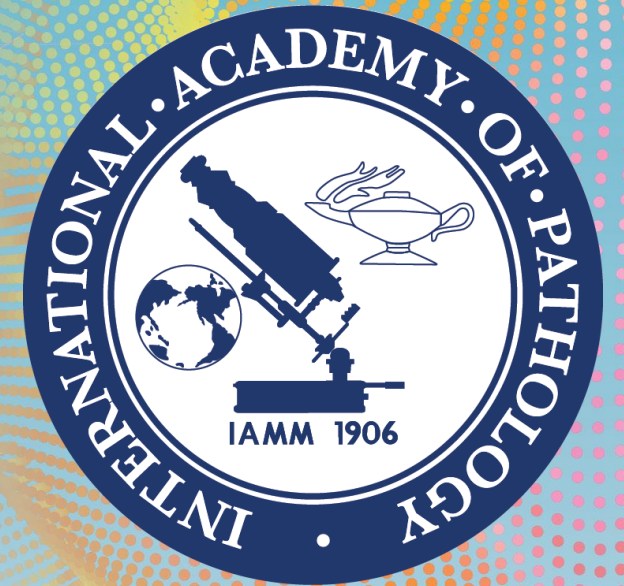


Crystals in the colon — a cause of colitis

Timothy Fielder

Department of Tissue Pathology & Diagnostic
Royal Prince Alfred Hospital, Sydney



Disclosure of Relevant Financial Relationships

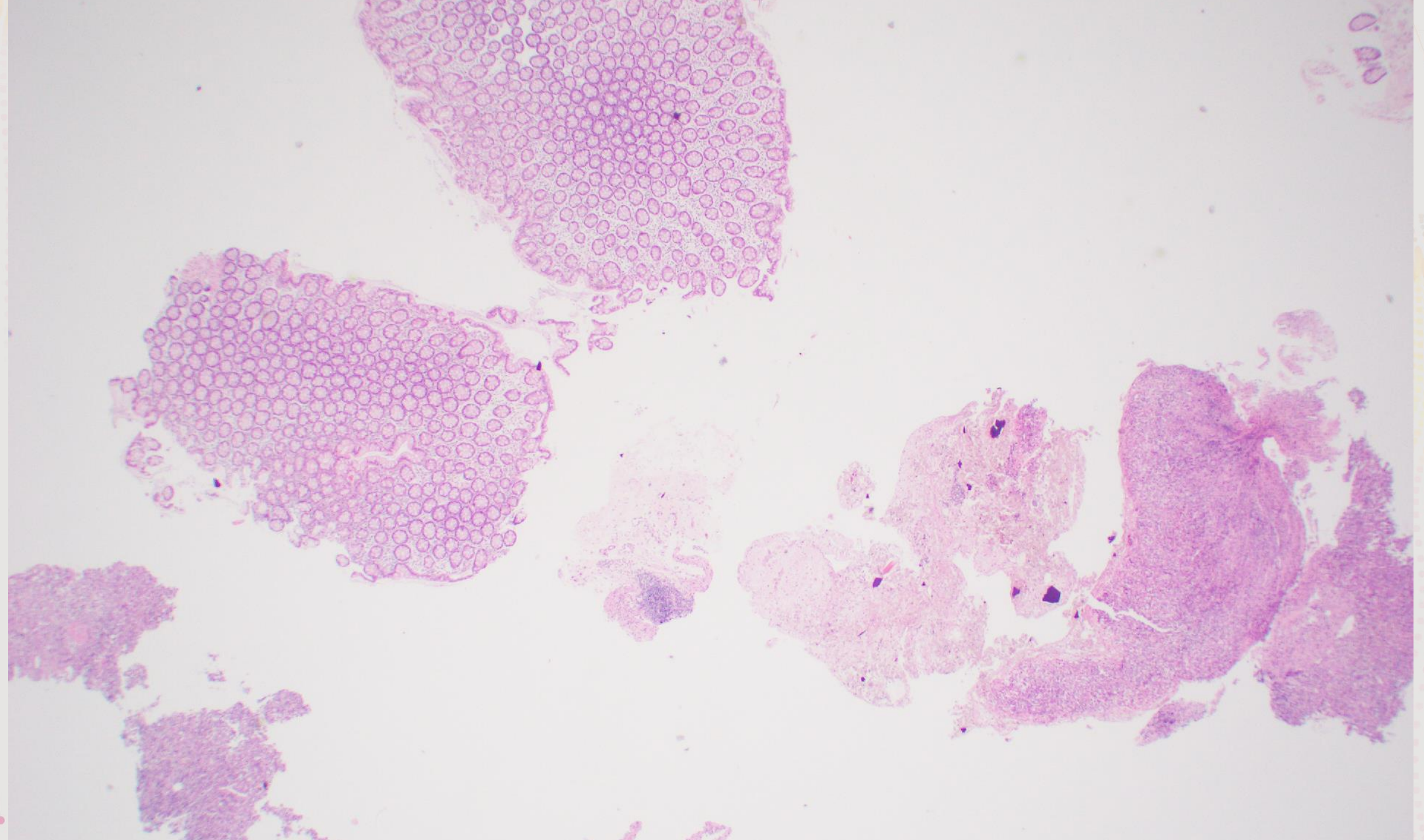
No relevant financial relationships.

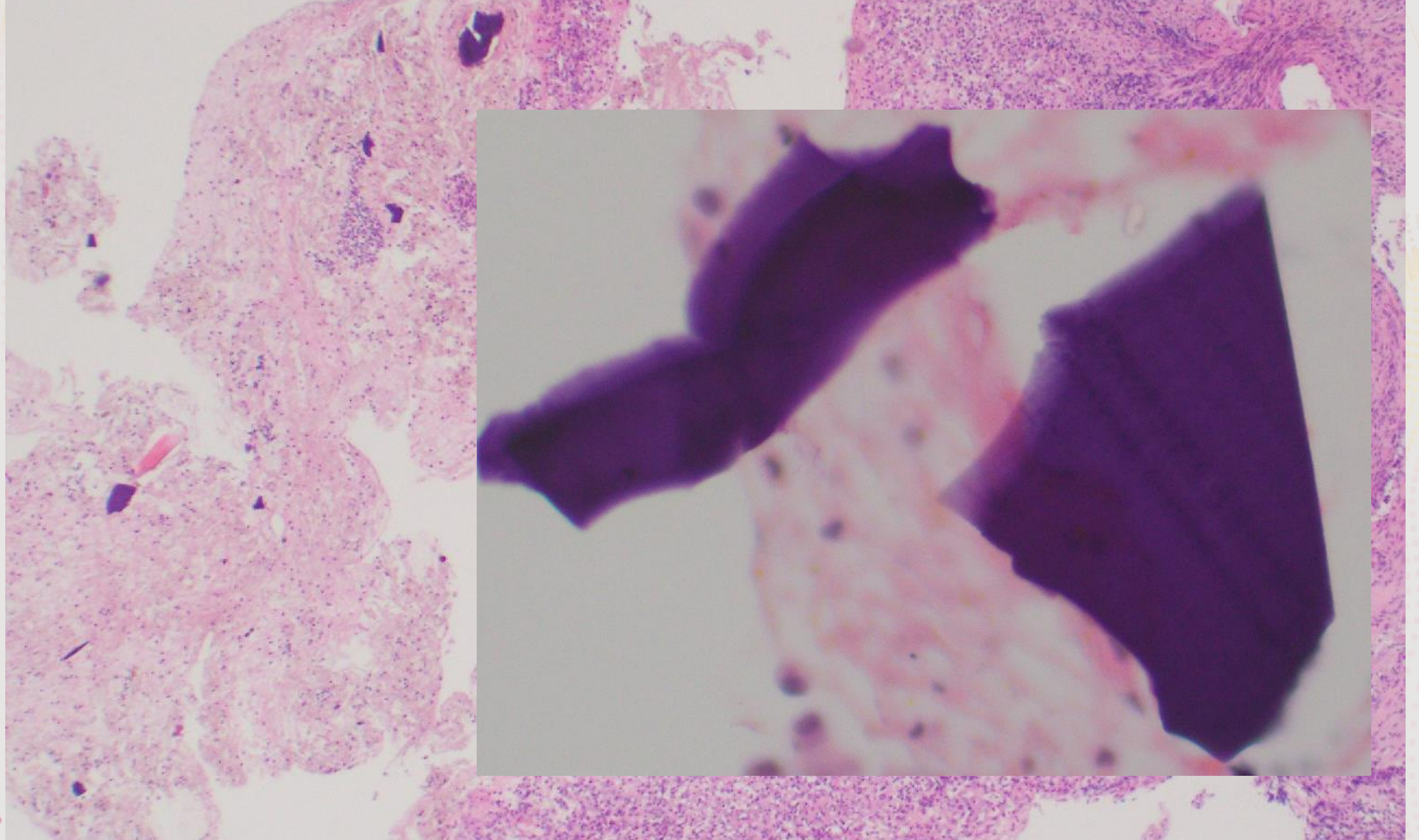
Background

- 60s M
- NSTEMI → CABG, subsequent cardiac arrest, long ICU stay
- Background: ESKD on intermittent HD, T2DM, HTN
- Developed GI bleed during ICU stay

Endoscopy

Friable, inflamed, ulcerated mucosa from mid rectum to distal sigmoid with rectosigmoid stenosis → further advancement not attempted





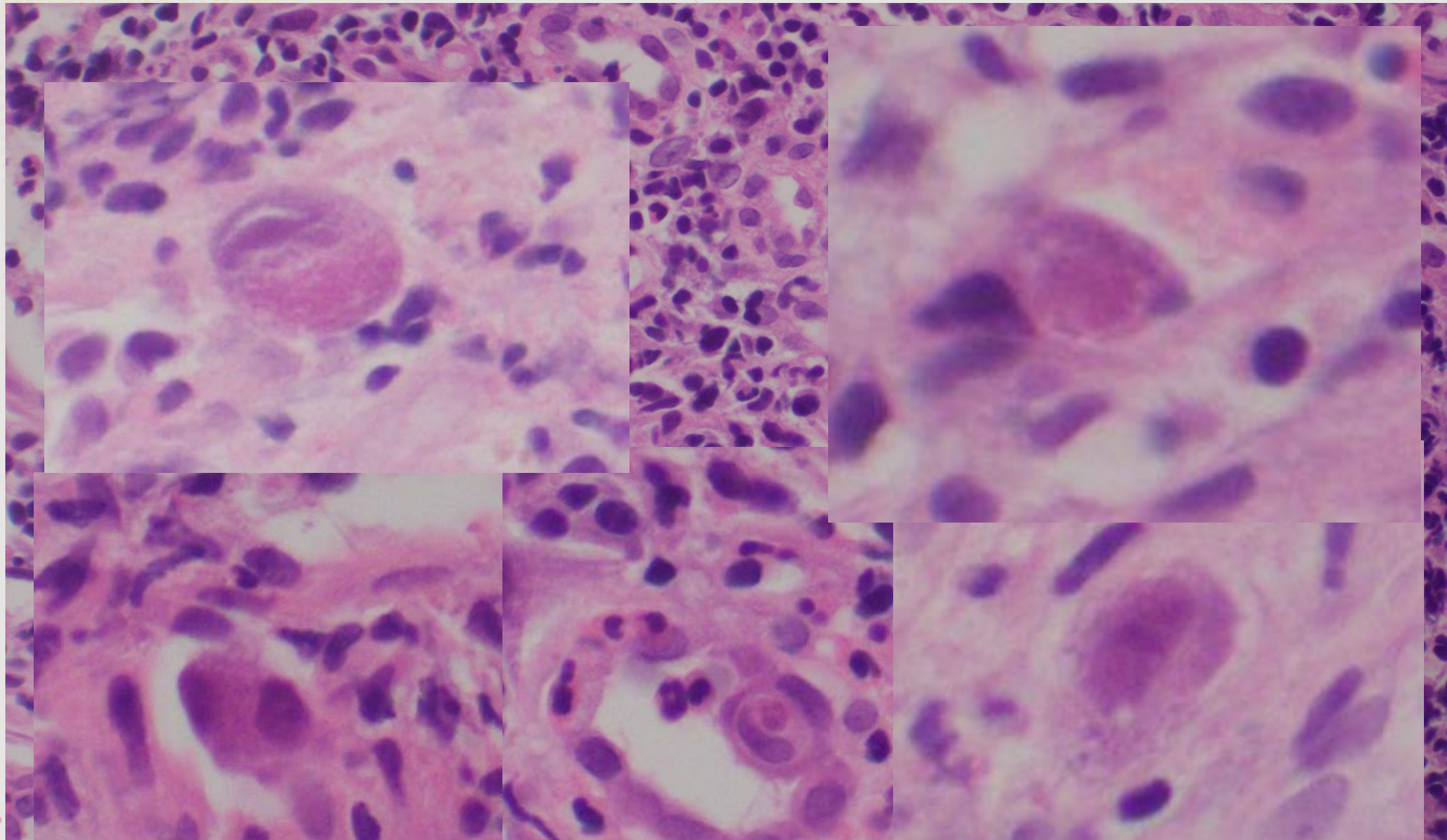
Histology

Ulceration with embedded pill fragments, see comment.

There is no evidence of dysplasia or malignancy.

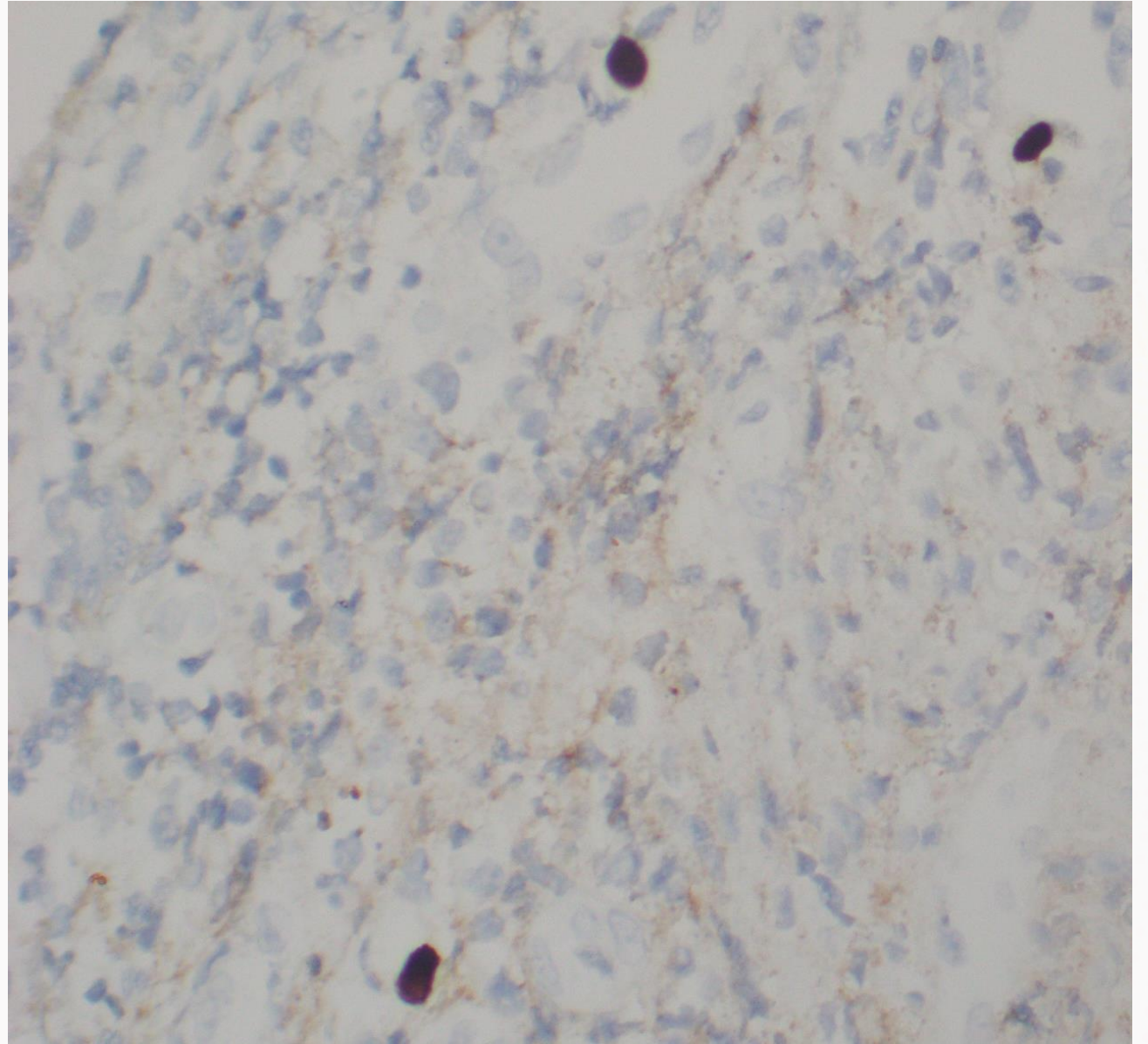
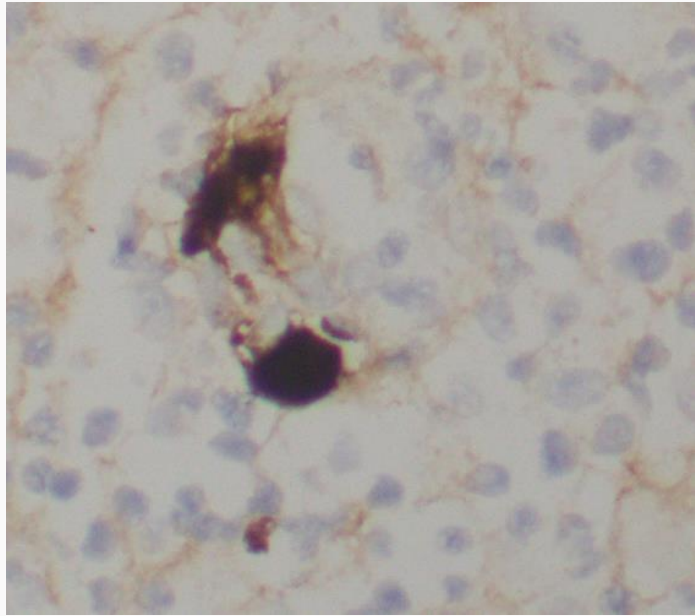
There are no granulomas or





IHC

CMV



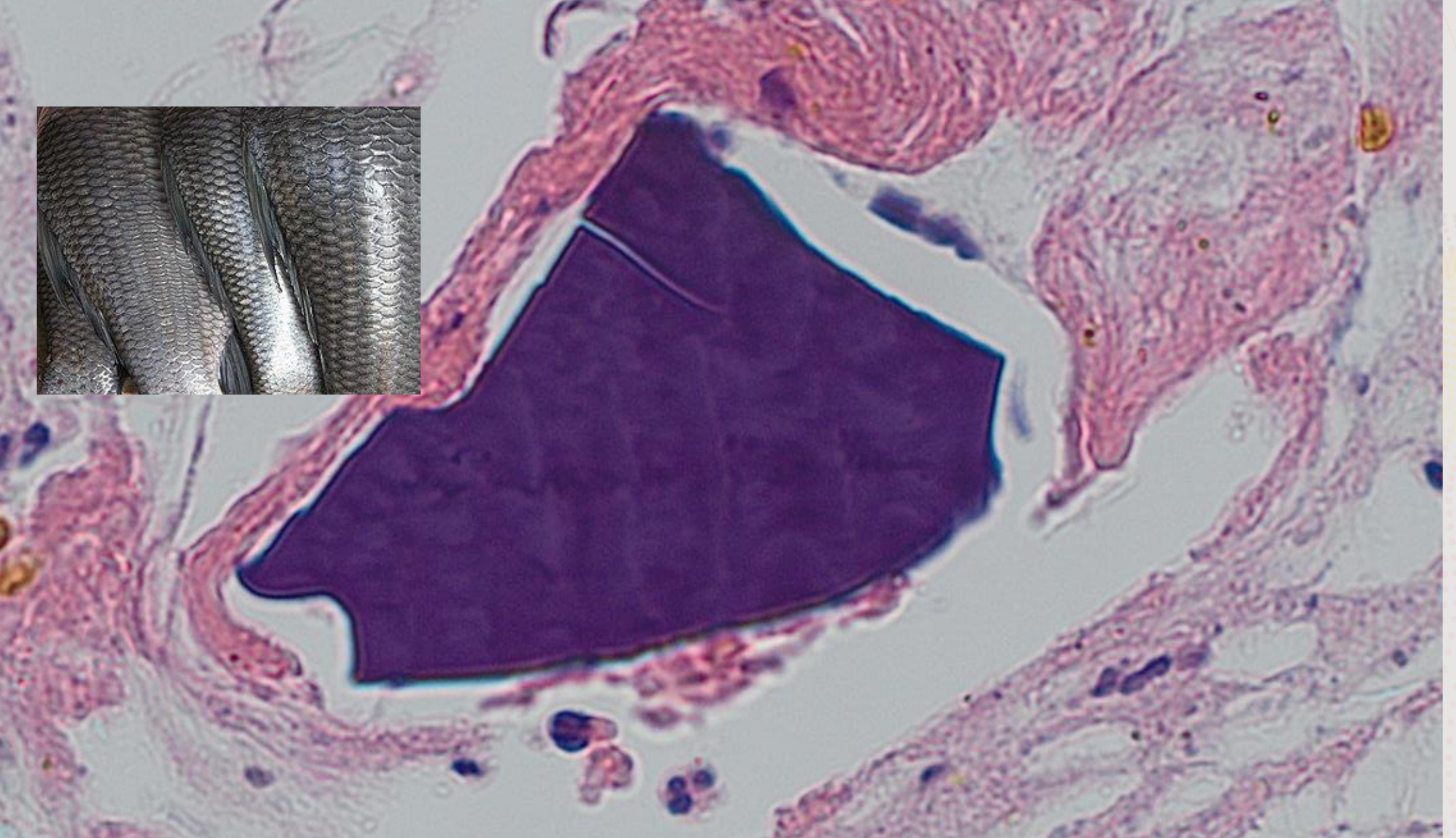
Case summary

Multifactorial colonic injury with ulceration

- **suspicious for pill injury**
- component of CMV colitis

Contributing factors

- Ischaemia/hypoperfusion
- Critical illness



Sodium polystyrene sulfonate

- Cation exchange resin (Kayexalate, resonium) – hyperkalaemia
- >100 cases published in literature of kayexalate-associated GI injury (vast majority colorectal) (Wu 2021)
 - Colitis, colonic necrosis, perforation (20% mortality rate)
 - Mechanism poorly understood
- Sorbitol coadministration potentiates the risk of injury
 - Multiple cases of colonic necrosis without sorbitol also reported (Harel 2013)
 - SPS with and without sorbitol causes colonic necrosis in rats (Ayoub 2015)

Sodium polystyrene sulfonate

- Injuries often occur in the presence of other comorbidities – renal disease, transplant, recent surgery, reduced GI motility
- Often other potential insults are implicated
 - Cases with CMV coinfection have been reported (Bansal 2021, Gurtler 2018)
- Cause or bystander?
 - 48 cases where kayexalate crystals were seen; only 2 had no histological evidence of GI injury (Ziemba 2019)
 - Animal models

Other common medication injuries

- Other ion exchange resins
 - Sevelamer – used to treat hyperphosphataemia
x sometimes associated with mucosal injury
 - Cholestyramine – bile acid sequestrant
x less clearly associated with mucosal injury
- Pill oesophagitis – antibiotics, Iron, NSAIDs, bisphosphonates, cation exchange resins
- Iron gastropathy

Summary

- Several medications can cause GI injury
- Ion exchange resins
 - **Sodium polystyrene sulfonate (kayexalate / resonium)**
 - Sevelamer
 - Bile acid sequestrants - ?ability to cause mucosal injury
- Causal relationship not always certain but pill fragments should be reported
- If you find one possible cause of colitis... keep looking

References

Arnold, MA et al. 2014, Am J Surg Pathol,
PMID: 24921636

Ayoub, I et al. 2015, PLoS One, PMID:
26413782

Bansal, N et al. 2021, Indian J Nephrol,
PMID: 33994695

Harel, Z et al. 2013, Am J Med, PMID: 23321430

Gurtler, N et al. 2018, Am J Case Rep,
PMID: 30072684

Wu, Y et al. 2021, Clin Exp Gastroenterol,
PMID: 33469334