CASE 1

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78 year old female, bloody diarrhea after antibiotic therapy with beta-lactam antibiotics
32 y female, diarrhea after ABx (amoxicillin/clavulanic acid) because of tonsillitis

bloody diarrhea 10/d
severe abdominal cramps & pain
CRP 172 (-9) leucocytes 17,500
C. difficile toxin A negative
Antibiotic-associated segmental hemorrhagic colitis

• often after beta-lactams (penicillin),... (+/- NSAIDs) due to “trivial” nose-, throat-, respiratory infections (e.g. tonsillitis, bronchitis,...)

• often young patients with severe bloody diarrhea and abdominal cramps requiring hospitalization

• *C. difficile* negative

• segmental colitis, right-sided dominance

• self-limiting after cessation of ABx

• First description Toffler et al. (Lancet 1978)
Antibiotic-associated hemorrhagic colitis (AAHC)

*Klebsiella oxytoca*
Gram-negative rod
Enterobacteriaceae
intrinsic ampicillin resistance

Hoegenauer et al. NEJM 2006; 355:2418-26

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A. Inflammation

B. Epithelial Alteration

C. Hemorrhage

D. Erosion

Hoegenauer et al. NEJM 2006; 355:2418-26

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AAHC resembles colitis due to cytotoxin producing pathogen

Apoptosis of epithelial cells, activated caspase 3 staining

AAHC human

AAHC rat
Antibiotic-associated hemorrhagic colitis (AAHC)

A

Transepithelial resistance

Apoptosis

Schneditz et al PNAS 2014
Severe *K. oxytoca*-associated colitis in a patient with immunosuppression after renal transplantation

Severe colitis with ulcerations

WBC: 27,000/mm$^3$; CRP 410 mg/l (0-9)
69 y, female, diarrhea after ABx for pneumonia
Antibiotic-associated hemorrhagic colitis (AAHC)
Cytotoxic effects on epithelium / vasculature

AAHC resembles histologically hemorrhagic colitis due to enterohemorrhagic E. coli (EHEC) and ischemic/NSAID colitis

Neumann H et al. Diarrhea caused by EHEC... Endoscopy 2011
Antibiotic associated hemorrhagic colitis

Histological features:

- Overall preserved mucosal architecture
- Mucosal hemorrhage
- Sparse/no active inflammation (neutrophilic granulocytes)
- Toxin effects on surface epithelium (micropapillary protrusions, ...), epithelial apoptosis
- Features of colitis due to EHEC, ischemic/NSAID colitis