Case Report: EBV Colitis Associated with Abdominal Compartment Syndrome in a Pediatric Immunocompetent Patient

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Introduction

Generally asymptomatic, Epstein-Barr Virus (EBV) is a herpesvirus that is known to have infected and become latent in more than 90% of the global population.[1]

- EBV associated diseases include infectious mononucleosis, nasopharyngeal carcinoma, Burkitt's lymphoma, Hodgkin's disease, post transplant lymphoproliferative disease, etc.[2]
- Colonic involvement in EBV is exceedingly rare and almost always associated with immunocompromised patients.[3]

Imaging

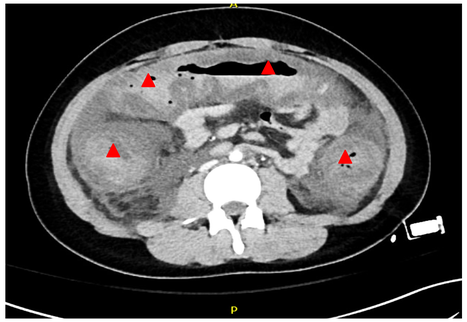


Fig 1. CT scan of the abdomen with IV contrast depicting severe diffuse pancolitis (arrowhead).

Presentation

A **15 year old** immunocompetent female with no significant past medical history presented with **abdominal pain, hematochezia, and fever.**

- No prior diagnosis or family history of gastrointestinal pathology, including irritable bowel syndrome or inflammatory bowel disease.
- No recent antibiotic use.
- **Positive COVID-19 infection four months ago.**

A computed tomography (CT) demonstrated **severe pancolitis** with diffuse wall thickening and associated cystitis, mesenteric and retroperitoneal adenopathy, and a moderate amount of free fluid. (Fig.1)

Pathology



Fig 2. Subtotal colectomy specimen

Hospital Course

- **Preoperative Course (0 - 92 hours):**
  - Progression of renal failure requiring dialysis, persistent hematuria and hematochezia with anemia.
- **Repeat CT scan:**
  - Thrombus in her superior mesenteric vein.
  - Bilateral hydronephrosis.
  - Increased colonic distention suggestive of toxic megacolon with associated abdominal compartment syndrome.
- **Operation 1:**
  - She underwent emergent exploratory laparotomy.
  - A subtotal colectomy was performed due to extensive colonic necrosis. (Fig. 2)
  - Her bladder and reproductive organs were mottled and concerning for necrosis. Temporary closure was performed.
  - Bilateral percutaneous nephrostomy tubes were placed.
- **Operation 2 and 3:**
  - Bilateral salpingo-oophorectomy with total abdominal hysterectomy.
  - An end ileostomy was created, and her fascia was closed.
  - Urology noted ureteral fibrosis. Bilateral ureter stents were placed.
- **Post Discharge Course**:
  - Development of a vesicovaginal fistula, small bowel obstruction requiring surgery.
  - Neobladder creation, ileo-rectal anastomosis, loop ileostomy.

Significant Results

- **Stool testing for Clostridium difficile, Campylobacter, Escherichia coli O157, and Shigella:** Negative.
- **Karius panel (DNA testing panel for over a thousand types of gastroenterology pathogens):** Positive only for EBV.
- **Colon specimen pathology**: Diffuse transmural congestion with hemorrhage and necrotic change.
- **Immunohistochemical stain for EBV:** Positive.

References

1. Dunmire SK, Verghese PS, Balfour HH Jr. Primary Epstein-Barr virus infection. *J Clin Virol*. 2018;102:84-92. doi:10.1016/j.jcv.2018.03.001
2. Denicola RP, Coben R, Katz L, McCue PA. Acute Gastrointestinal Hemorrhage due to Epstein-Barr Virus Colitis. ACG Case Rep J. 2019;6(10):e00238. Published 2019 Oct 15. doi:10.14309/crj.0000000000000238
3. Choi C, Yu Q, Deb PQ, Wang W. Rare case of EBV-induced colitis in an immunocompetent individual. *BMJ Open Gastroenterol*. 2020;7(1):e000360. Published 2020 Mar 25. doi:10.1136/bmjgast-2019-000360
4. Gold JE, Okyay RA, Licht WE, Hurley DJ. Investigation of Long COVID Prevalence and Its Relationship to Epstein-Barr Virus Reactivation. *Pathogens*. 2021;10(6):763. Published 2021 Jun 17. doi:10.3390/pathogens10060763
5. Ryan JL, Shen YJ, Morgan DR, et al. Epstein-Barr virus infection is common in inflamed gastrointestinal mucosa. *Dig Dis Sci*. 2012;57(7):1887-1898. doi:10.1007/s10620-012-2116-5
6. Afzal M, Nigam GB. EBV colitis with ulcerative colitis: a double whammy. *BMJ Case Rep*. 2018;2018:bcr2018224963. Published 2018 Jun 29. doi:10.1136/bcr-2018-224963

Discussion

In 30 patients with symptoms consistent with long COVID, 20 patients (66%) were positive for EBV reactivation.[4] EBV DNA was detectable in 44% of colonic mucosa with a higher percentage in patients with Crohn's disease and ulcerative colitis (55% and 64% respectively.)[5]

- There is a case report describing a 21-year-old male who was diagnosed with colitis with superimposed EBV infection discovered after poor initial response to steroid treatment for his assumed ulcerative colitis flare.[6]
- There is a case report of a 61-year-old female with a history of diverticulosis and hypercoagulopathy who developed hemorrhagic EBV colitis with intestinal ischemia. She was treated with anti-viral medications.[2]

Conclusion

Despite multiple case reports of EBV colitis being limited to immunocompromised patients, our pediatric patient with no known risk factors other than recent COVID-19 infection developed re-activation of her EBV infection leading to fulminant colitis.

This report of an immunocompetent pediatric patient with biopsy-proven EBV colitis developing abdominal compartment syndrome is a rare presentation that has not been previously described in the literature.