Clinico-Pathologic Conference: November 16th, 2021, 8 am – 9 am

Chief Residents: Mia Harton, MD & Erin McCann, MD, MPH

Chief Complaint: Fever, abdominal pain

First Presentation to ED

- 21 month old Latinx male presents with 2-3 days of fever, Tmax 103°F, associated with mild bloating, but no vomiting or diarrhea
- No other sick symptoms
- Continued to drink well with good UOP
- Unremarkable exam except for mild abdominal distention
- Neg COVID swab
- Diagnosed with viral illness and discharged home with supportive care

Second Presentation to ED

- Presents 2 days later with severe abdominal pain and progressive distention
- Associated with:
  - Continued daily fevers with Tmax 103°F
  - Non-bloody vomiting and diarrhea
  - Yellowing of skin and eyes
  - Decreased activity & refusal to walk due to pain
  - Decreased PO intake & darker urine
- No recent travel, no sick contacts

Pertinent ROS

- Constitutional: Fevers, no weight loss.
- HENT: no rhinorrhea or nasal congestion. No conjunctival injection.
- Respiratory: No cough, chest pain, or dyspnea.
- GI: Abdominal pain with distention, vomiting and diarrhea. Decreased appetite. No blood noted in emesis or stool.
- GU**:** Concentrated urine. No dysuria or hematuria.
- Hematology: No easy bruising/bleeding.
- Neurologic: No headaches, weakness, or paresthesias.
- MSK: No muscle aches, joint swelling or joint pain.
- Skin**:** No rashes, yellowing of skin.
- Allergy/Immunology: no recurrent infections.

PMH/PSH/Meds/Allergies

No significant past medical history. Born at term without complication, normal newborn course.
No surgical history.
No daily medications, only PRN Tylenol and ibuprofen during this illness.
Allergies: No known allergies.
Immunizations up to date as of 12 months.

Family History

Father and paternal grandfather with "genetic cirrhosis" in adulthood.

Social History

Lives with mom, dad and 4 other children (2 brothers, 2 cousins). Parents Guatemalan, patient born in Cincinnati.

Physical Exam

- *Vitals:* **Temp** 36.5°C **HR** 153 **RR** 62 **BP** 80/43 **SpO2** 98% **Weight** 12.7 kg (63%tile) **Height** 87cm (74%tile)
- *General:* Ill-appearing, appears uncomfortable, crying on palpation of abdomen, alert but less active.
- *Eyes:* Sclera anicteric, conjunctiva normal, PERRL.
- *HENT:* Atraumatic, external ears normal, nose normal, oropharynx dry
- *Neck:* Supple with full range of motion.
- *Respiratory:* Tachypneic but no respiratory distress, chest rise symmetric without retractions, no stridor, no wheezes, rhonchi or diminished air movement
- *Cardiac:* Tachycardic, no murmurs, no gallops, no rubs
- *Abdomen:* Soft but distended, significant tenderness to palpation diffusely, no rebound, no guarding. No palpable masses but exam limited to patient discomfort.
- *GU:* normal male external genitalia, testes descended.
- *Musculoskeletal/Ext:* No edema, no deformities. Pulses 2+ in all extremities, cap refill 3-4 sec.
- *Skin:* No rash or nodules. Mild jaundice. Warm to touch.
- *Neurological:* Awake and alert but sluggish. Moves all four extremities. Light touch intact. CN II-XII grossly normal. Grossly normal strength.

ED Workup

8.7 / 3.27 / 26 / 24.7	Segs: 24% Bands: 3.5% Lymphs: 67% Mono: 1% Eos: 0% Baso: 0%	Urine pH: 5.0 U Protein: 30 U Blood: Small U Glucose: 100 U Ketone: Trace U Bili: Large
Procal: 43.06 CRP: 19 ESR: 24 Ferritin: 18, 217	Metamyelo: 4% ANC: 0.89 ALC: 2.18	U Nitrite: Positive U LE: Negative U Spec Grav: 1.025 WBC/HPF: None RBC/HPF: None

127	98	25	88	Ca: 8.6 Mg: 1.9 Phos: 2.2 Alb: 2.4	Total Protein: 4.8 ALT: 174 AST: 303 Total Bili: 3.1 Direct Bili: 2.7 Alk Phos: 257
4.3	16	0.63			

SARS-CoV-2 (PCR): Negative
COVID Antibodies: Reactive

Lipase: 53

LDH: 1,783 Uric Acid: 9.1	Lactate: >8	Triglycerides: 153
PT: 15.5 INR: 1.37 APTT: 43.3	Fibrinogen: 163 D-Dimer: 47,838	BNP: 5 Troponin: <2.5 EKG: sinus tachycardia

Imaging: CXR normal, KUB with mild diffuse gaseous extension, no obstruction. CT Abdomen/Pelvis: Moderate amount of ascites with periportal edema and gallbladder wall thickening, and mesenteric edema; small bilateral pleural effusions, R>L; hepatosplenomegaly.

ED Care/Disposition: Received total of 60ml/kg LR boluses for uncompensated shock. Blood and urine cultures sent. Started cefepime and Flagyl with concern for sepsis of presumed abdominal etiology. Admitted to PICU for further management.

Hospital Course (Day 1)

- Progression of illness*:*
  - *CV*: Persistently febrile with associated tachycardia, worsening lactic acidosis
  - *Resp*: Worsening tachypnea, gases with severe metabolic acidosis requiring intubation overnight
  - *GI*: Worsening abdominal distension, ammonia elevated, transaminases increasing, started Vit K; large, bloody bowel movement → stool studies sent
  - *Heme*: Required pRBCs, platelets
- Imaging: Echo with normal function, no significant pericardial effusion.

Hospital Course (Day 2-3)

- Respiratory failure, systemic inflammation, multisystem organ dysfunction, pancytopenia, refractory acidosis
- Progression of illness:
  - *CV*: Pressors started due to hypotension, repeat Echo with normal function
  - *Resp*: Remained intubated
  - *GI*: Worsening LFTs (AST>ALT)
  - *Renal*: CRRT started for refractory lactic acidosis
  - *Heme/Onc*: Bone marrow aspirate & biopsy obtained, LP deferred due to severe coaguloapthy, continued to require transfusions including cryoprecipitate, platelets, FFP
  - *Neuro*: Sedated and intermittently paralyzed

Additional Labs/Lab Trends:
Peripheral blood smear without blasts
Blood and urine cultures: No growth
Bacterial and viral stool studies: Negative
Hepatitis studies: HbSAb positive, otherwise negative
Urine NGAL 143 → 2,486 → 14,441
ALT trend from 174 → 518
AST trend from 303 → 2,973
Lactate persistently elevated ranging from 19-24
Ammonia elevated 33-94

Hospital Course (Day 4)

- Patient is clinically unchanged with multisystem organ dysfunction, requiring mechanical ventilation and CRRT, discussions about starting MARS
- Bone marrow aspirate with no leukemia, but with non-specific T-cell lymphoproliferation & hemophagocytosis
- EBV PCR results: 25,737,300 IU/mL

Further tests were conducted on the bone marrow biopsy given the elevated EBV. Based on the results of this analysis, a final diagnosis was made.

What test(s) supported the diagnosis and what is your final diagnosis?

Please submit your answers via the QR code shown below.

CLINICO-PATHOLOGIC CASE GRAND ROUNDS
November 16th, 2021

Name: _____

Level of Training/Current Position: _____

What test confirmed the diagnosis? _____

What is your final diagnosis? _____

I had prior knowledge about this case (circle one):
Yes No