The Microbe Blotter: Multiple Arrests Made

A Patient with Fever after Chemotherapy

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Case

- 58 year old woman diagnosed with SCCa of cheek in early 2015. Symptoms included lip numbness. Early wide excision with negative margins. Early 2015: worsening, persistent left facial pain. Sept 2015, MRI demonstrated perineural involvement V2, including near base of skull.
- Oct ‘15: Began XRT and Cisplatin (w/ steroid) c/b mucositis, leukopenia (ANC nadir 1.2K)
- 11/17 Dose 2 of Cisplatin (75%) (w/ steroid)

Case cont.

- 12/1 Rad Clinic → ED b/c low BP despite NS.
- Chills x 3-4 days, rigors x 1 day; + HA, fatigue. No subjective fevers.
- Exam: T=38 P 75 RR 16 96%RA A & O, Surgical changes to L face, mucositis, dried blood L nare
- Labs: WBC 2.2K (1800 PMNs), Hgb 10, Plt 136K/mm3,

  Creat 0.9; LFTs OK; UA(-); CXR (-); Blood cx's;

  Lactate 1.0; RVP (-)
- Admit to Hem-Onc: Vanco, Pip-Tazo

Case continued

- 12/3 Tx to MICU b/c of hypotension, “septic shock;“ T-38.6, rigors; Short use pressors; 1 of 4 blood cx’s: Cog Neg Staph; Tx back to ward on 12/5, cont’d abx.
- 12/6 ID consulted b/c of cont’d intermittent fevers ~39.5.
- CC: improved facial pain, no localizing complaints, no longer w/ chills. ROS o/w negative.

- PMHx: Anxiety, depression, HTN
- Social: divorced, lives in Quad Cities
- PE: 37.5, other VSS. Left cheek surgical & XRT changes, shallow ulcers mouth left upper, no rash
- Labs: hgb 7.8, plt 111, WBC 1.9, Lymph ~200, LDH 229; 12/5 CXR: linear atelectasis R base

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Additional labs

- CMV PCR negative
- Crypto Ag negative
- Histo urine Ag negative
- Aspergillus GM negative
- HSV 1 & 2 PCR from oral lesion: negative

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Stable off antibiotics, discharged w/ lab pending

Additional Micro Results

12/7/15 Blood: qualitative Parvovirus PCR (+)

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Additional Clinical Information

2/23/16 Pt feeling well. No fevers. Hgb 12.6

Blood: Parvovirus PCR 5200 IU/ml

(1 IU = 0.73 copies)

No serologies performed

Major Diseases Caused by Parvovirus B19

(Young and Brown, nejm, '04)

Table 1. Major Diseases Caused by Parvovirus B19.

Disease	Acute or Chronic	Host
Fifth disease	Acute	Normal children
Arthropathy	Acute or chronic	Normal adults
Transient aplastic crisis	Acute	Patients with increased erythropoiesis
Persistent anemia	Chronic	Immunodeficient and immunocompromised patients
Hydrops fetalis and congenital anemia	Acute or chronic	Fetus

Parvovirus B19 Disease (Young and Brown, nejm)

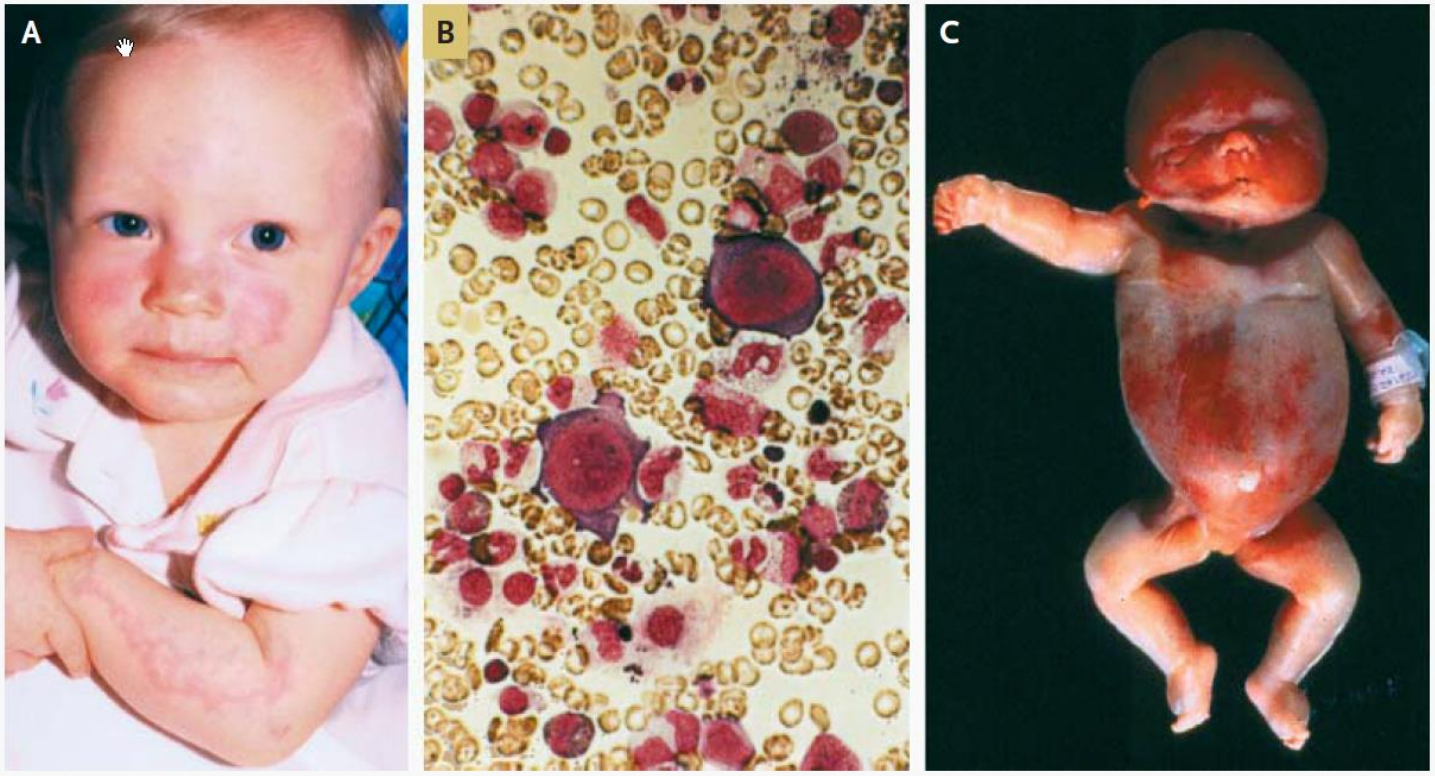

Figure 3. Clinical Manifestations of Parvovirus B19 Infection.

Panel A shows typical cutaneous eruptions in fifth disease, including "slapped" cheeks in children and a more generalized lacy, reticular pattern of erythema. Panel B shows a bone marrow aspirate with no mature erythroid precursors and with characteristic giant pronormoblasts. In Panel C, hydrops fetalis is evident in an infant who was infected in utero in midtrimester (courtesy of Dr. O. Caul).

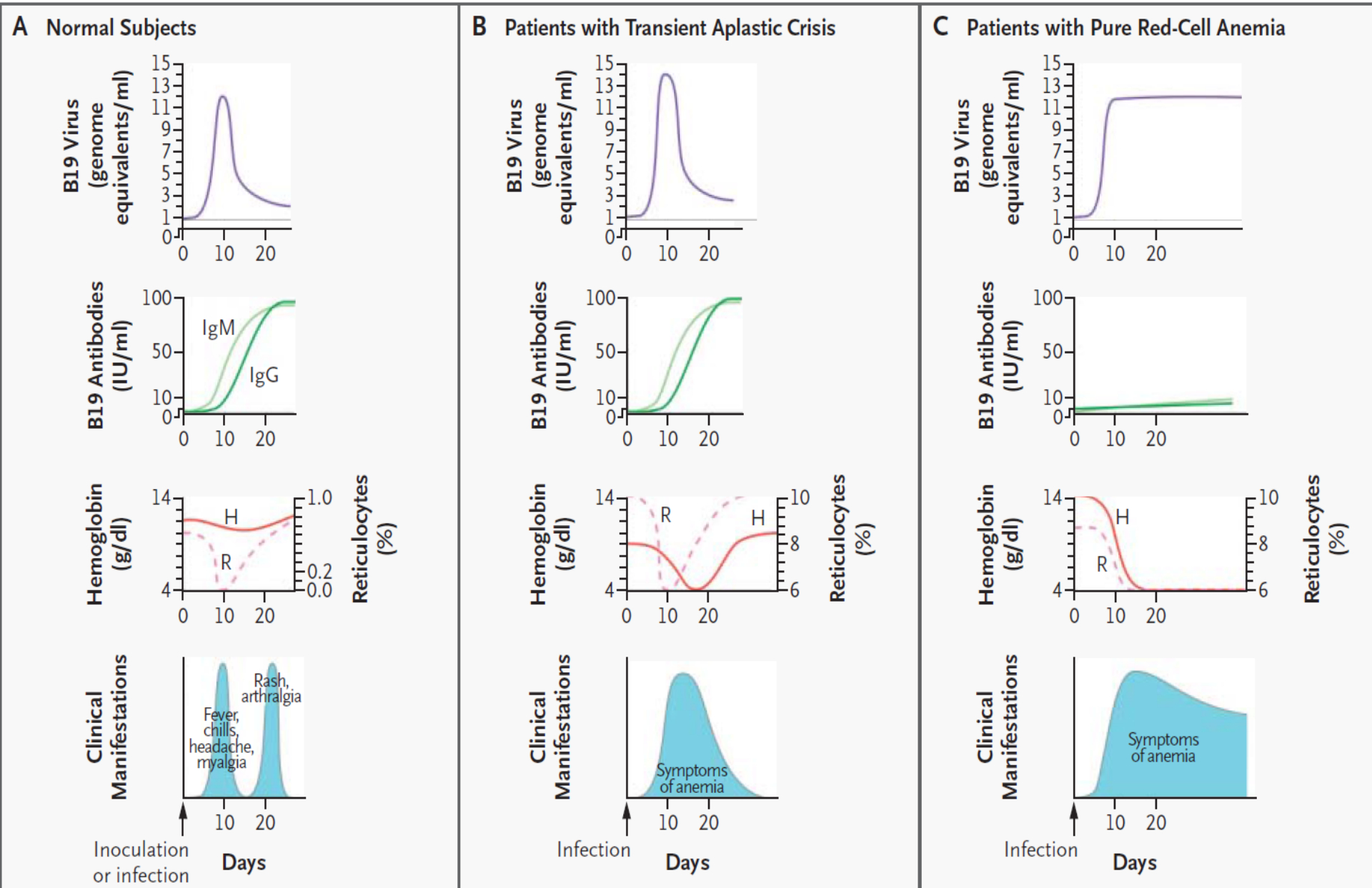

Figure 4. Pathophysiology of Parvovirus B19 Infection.

Clearance of B19 Viremia after Acute Infx

(Lindblom CID '05; pt's referred w/ acute syndrome c/w B19 & IgM+)

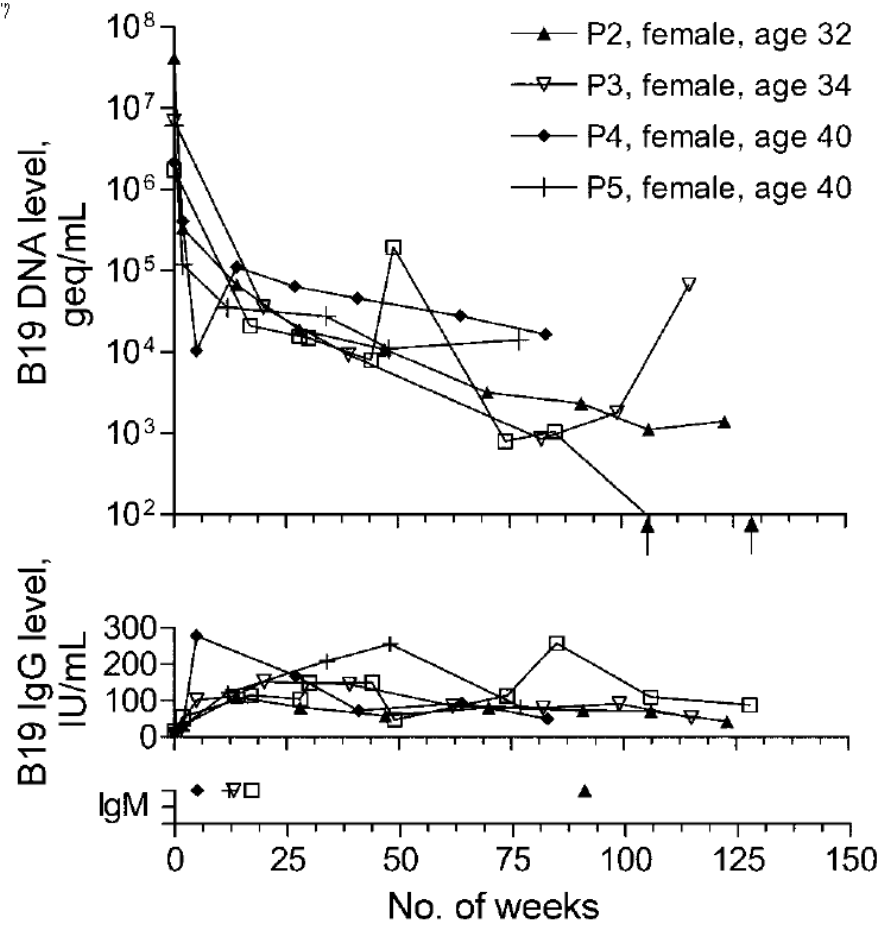

Figure 1. Kinetics of human parvovirus B19 (B19) DNA and antibody responses against B19 in serum after acute infection in patients 1–5 (P1–P5, respectively). The lower panel shows the last time point at which each patient tested positive for serum IgM. Arrows indicate negative sample time points for patient 1. The figure refers to the number of weeks after the first sample was taken.

Diagnosis of B19V Infection

Table 2. Results of Diagnostic Assays for Diseases Caused by Parvovirus B19.*

Disease	IgM	IgG	B19 DNA Hybridization	B19 DNA Amplification
Fifth disease	+++	++	–	+
Arthropathy	++	+	–	+
Transient aplastic crisis	+/–	+/–	++	++
Persistent anemia	+/–	+/–	++	++
Hydrops fetalis and congenital infection	+/–	+	+/–	++
Previous infection	–	++	–	+/–

* The sensitivity of direct DNA hybridization methods is approximately 10^6 genome copies per milliliter, and the sensitivity of DNA amplification techniques (polymerase chain reaction) is approximately 10^2 genome copies per milliliter.[118,121] Plus signs and minus signs denote positive and negative results, respectively, and greater numbers of plus signs indicate stronger positive results.

Additional Syndromes Attributed to B19V Infx (some w/ skepticism)

- Myocarditis
- Necrotizing vasculitis
- Kawasaki disease
- HSP
- Glove-and-socks syndrome
- Meningitis/encephalitis (children)
- Macrophage activation syndrome
- Transfusion-associated disease

Questions for Dr. Klemserova

- 1. Why is Parvovirus B19 tropic for certain cell types?
- 2. What are the effects of B19V on erythroid precursors (or other cells impacted by infection), and what is their pathogenesis?
- 3. What clinical significance, if any, does purported long-lasting B19V infection have?