Abstract

Many pediatric patients that you encounter will challenge your diagnostic and therapeutic skills. As the following cases will illustrate, some will perplex you with their esoteric or convoluted illnesses despite your best attempts. Although their initial presentation may often be mundane, thorough history taking and physical examination, and a keen “clinical intuition” will be invaluable. [Pediatr Ann. 2015;44(1):12-17.]

I am continuously amazed at the acuity and complexity of patients that we see here in rural Kentucky. This article will again demonstrate that a pediatrician better have listened and learned carefully while in residency about the nuances and esoterica of pediatric diseases. For that one or two patients a day, the very careful thorough physical examination, the reliance upon your “sixth sense,” the willingness to avoid over-simplification (eg, “Occam’s principles”), and the knowledge base to be agile with your differential diagnosis are critical.

Here is hoping that you have been able to peruse most of the interesting cases and pediatric issues that have been published in this column over the past 3 years. If not, I encourage you to dig them out, as one of them may help you save a life or two.

Finally, to my fellow readers and astute critics, I leave you with the words Shakespeare penned for the lips of Juliet: “So loving-jealous of his liberty… Parting is such sweet sorrow.”

CASE 1

An 8-year-old white female presented with 1 day of watery diarrhea and periumbilical abdominal pain 5 days ago. Her physical examination was normal except for a 3-pound weight loss, her urine analysis had 1+ protein, and her strep antigen detection test (ADT) was negative. She was managed as having viral gastroenteritis. During her visit today, she complains of nausea and vomiting for the past 3 days, along with headache, sore throat, and abdominal pain. She has had poor oral intake, marked decrease in urination, and poor sleep the previous night.

On physical examination, her weight is 76 pounds (down another 2 pounds from her initial visit), blood pressure is 98/66 mm Hg, temperature is 99°F, and pulse is 124 beats per minute. Although she is able to walk down the hallway, she looks sallow, somewhat dehydrated and uncomfortable with abdominal pain, and is lying too quietly on her side. Her abdominal examination is remarkable for moderate diffuse pain, which is worse in the right lower quadrant with voluntary guarding, some direct rebound tenderness, and no bowel sounds.

She was unable to provide a urine sample, but her leukocyte count was 43,000 cells/mm³ with 90% granulocytes, hemoglobin was 11.6 g/dL, and platelets were 61,000/mcL. You decide to urgently transfer her from your office to the children’s hospital via ambulance, thinking that she most likely has a perforated appendix in light of her abdominal pain, guarding, ileus, and profound neutrophilic leukocytosis. Obtaining further laboratory tests and an essential computed tomography (CT) scan of the abdomen in your office setting could delay therapy. You know that she needs quick intravenous access, which was obtained by the rapid-response ambulance crew, and you recommended a 10-mL/kg bolus of normal saline en route.

She is seen in the pediatric emergency department where a complete evaluation for appendicitis was performed, including a surgical consultation. She is then promptly admitted to the intensive care unit shortly after her arrival, but with a totally different diagnosis.

The red flag here was the thrombocytopenia. How did this relate to her probable acute abdomen when she was first seen? Similar to my previous article’s...
discussion about petechiae, the differential diagnosis widened considerably until the remainder of the other basic laboratory tests were returned.

With her “stat” test results in hand, now you understand her new presumptive diagnosis and why your brain set off internal alarm bells during the initial moments of the office visit: blood urea nitrogen (BUN) was 136 mg/dL, creatinine 6.9 mg/dL, potassium 6.4 mEq/L, chloride 79 mEq/L, calcium 7.3 mg/dL, bicarbonate 17 mEq/L, lactic dehydrogenase 6403 IU/L, uric acid 14.4 mg/dL, and alanine transferase 166 U/L. Her abdominal CT scan showed a normal appendix with obvious edema and thickening, and dye enhancement of the ascending and transverse colon (see an example in Figure 1A).

Although you now know that she has hemolytic uremic syndrome (HUS), strangely, she has had almost no diarrhea. Unfortunately, she received a dose of ceftriaxone in the emergency department—due to her severe acuity of illness and leukocytosis and presumptive ruptured appendix—before the stool culture was obtained. Over 90% of HUS cases have Shiga toxin-producing Escherichia coli (STEC) O157. However, the US Centers for Disease Control and Prevention (CDC) have reported more STEC non-O157 strains lately. The patient’s stool culture was negative.

The syndrome of HUS results in simultaneous microangiopathic hemolytic anemia, thrombocytopenia, and acute kidney injury. HUS is typically associated with bloody diarrhea, which is usually the most important early warning sign.

This patient was in total acute renal failure and required either peritoneal- or hemo-dialysis for nearly 1 month before her full recovery. Four more cases of HUS in the region were also admitted to this children’s hospital within this same month. Alarmingly, this girl was the third case in our office within 5 years (with one other young male requiring dialysis for a few weeks), despite the incidence being reported as merely 2 to 3 cases per 100,000 children younger than age 5 years (Figure 1B). Welcome to rural pediatrics!
The CDC is now reporting that incident cases of HUS have increased across the United States in the past few years for unknown reasons. Most children with acute renal failure will recover; however, long-term monitoring for high blood pressure, proteinuria, and renal failure may still be necessary in many patients.

Critically, despite the onset of renal failure and the potential to worsen hypertension, early volume expansion is widely underused but is actually considered nephro-protective! So your prompt fluid bolus initially was quite fortunate for the patient here. Two months later, the patient has recovered totally.

**CASE 2**

An otherwise healthy 16-year-old black male presented with signs and symptoms of a viral upper respiratory infection. But as you examined his abdomen, you noted peculiar looking, grayish-to-brown round and ovoid hyperpigmented lesions over his entire abdomen and lower back (Figures 2A and 2B). They have been present for at least 4 months, and seem to only mildly itch. Which single test will give you the probable diagnosis?

You were taught that any hyperpigmented lesion on the trunk deserves a simple test: the Woods lamp (or “dark light”) visualization in a completely darkened room. Tinea versicolor lesions will glow yellow, orange, or green when exposed to the Wood’s lamp illumination. I recommend that every office keep one available.

In this patient, the fluorescence extended below his pants line and up to his neck, giving you both the correct diagnosis and the total distribution of the rash for topical treatment. The causative pathogen is *Malassezia furfur* or *M. globosa*, which are typical fungal pathogens. The simplest and most economical treatment is selenium sulfide shampoo (Selsun Blue; Sanofi, Paris, France), which is available over the counter. It should be applied to the entire affected area in the evening, left on overnight, and washed off in the morning, and this should be done once per week for a full 4 weeks.

**CASE 3**

The mother of a 3-week-old black female infant brings the baby into your office today because she has developed a red lump under her left breast. The child is afebrile, but she is eating less vigorously today, and she cries much more readily as well. Upon physical examination, she is afebrile and otherwise normal except for the markedly reddened, swollen, and tender left breast tissue (Figure 3A). She has no other pustules or skin lesions. This child has an obvious mastitis, which is
Healthy Baby/Healthy Child

usually caused by methicillin-resistant *Staphylococcus aureus* (MRSA) or methicillin-susceptible *S. aureus*, and rarely by gram-negative and Group B streptococcal organisms. After age 2 weeks, mastitis occurs twice as commonly in females as in males. However, you have seen a few cases of early, less extensive mastitis in infant males (Figure 3B).

You must decide whether to admit this infant for parenteral antibiotics, and also whether she needs a surgical incision and drainage procedure. During your examination, you thought that the breast tissue had some fluctuance, as has been reported in over two-thirds of neonates. She also had an increased leukocyte count of 14,600 cells/mm³ with 85% granulocytes. You obtained a blood culture (reported as positive in 4% of infants), and admit her to the hospital for parenteral antistaphylococcal antibiotics, particularly for MRSA. You were surprised when the pediatric surgeon declined to either aspirate the fluctuant area or to perform an incision and drainage procedure for culture and for therapeutic reasons.

Per recent recommendations, both the girl and the boy were successfully treated with clindamycin, either parenterally or orally, respectively.***

**CASE 4**

You were asked by your nurse practitioner to examine a peculiar rash on the leg of a 7-year-old white male. The rash was rather spotty and serpiginous, with central clearing areas throughout its length (Figure 4A). You also noted the central punctum bite-like area on his knee (Figure 4B), although he denied any tick or other insect bites in the past 2 months. Because the weather was still warm, you surmised that this was most likely a tick bite from a tiny deer tick that went unnoticed by the patient or parents, and then the tick was probably scratched off unwittingly. You have seen other cases of Lyme disease with similar appearances.

Your nurse practitioner was unfamiliar with the treatment regimen for Lyme disease. You recommended that she prescribe twice daily oral doxycycline, which has a somewhat higher cure rate than oral beta-lactam antibiotics. Although she was concerned about dental staining, you explained to her the extremely rare likelihood that a 10- or 14-day treatment course with the fat-soluble tetracycline, doxycycline, would cause any noticeable dental staining, particularly in a 7-year-old. You remind her that poorly treated Lyme disease has the significant potential to cause major irreversible arthritis and even (rarely) central nervous system disease. The benefits of doxycycline clearly outweighed the risks in your opinion.

She also inquired as to whether this could be any other disorder. You reassured her also that this rash was obviously different in appearance than the other typical linear rashes, such as lichen striatus (Figure 5) or lymphagitis.

**CASE 5**

A 7-year-old white female is carried by her mother into your examination room because she refuses to walk. She has had a fever to 103.2°F, terrible sore throat, headache, general abdominal pain, and malaise; and today she has had an abrupt onset of severe joint pain in her ankles, knees, and left wrist. Upon examination, you observe a markedly reddened exudative tonsillitis, tender swollen anterior cervical nodes, and a harsh 2/6 level systolic murmur heard best along the lower left sternal border and radiating almost to the apex. She
is tachycardic, febrile to 102.2°F, with normal blood pressure, respirations, and pulse oximeter reading. Her ankle and knee joints are exquisitely tender, and she cries if you move them even slightly. The left ankle even seems a bit swollen. Her right posterior thigh area has a few small 1- to 2-cm non-reddened but slightly tender nodules.

Her sedimentation rate is 30 mm/hour, leukocyte count is 17,700 cells/mm³, hemoglobin is 13.2 g/dL, strep ADT is positive, electrocardiogram (ECG) is normal, and chest radiograph is normal.

You are quite concerned that you may be seeing your first case of new-onset acute rheumatic fever in more than a decade. Could she have a diagnosis of rheumatic fever in light of her positive streptococcal ADT and possibly two major Jones criteria (severe arthralgia/arthritis, new-onset heart murmur such as mitral valve regurgitation, and possibly even rheumatic nodules that you have never seen before) and several minor Jones criteria (fever, elevated acute phase reactants)?

You call your pediatric cardiologist who agrees with your decision to have her admitted for further evaluation and treatment. You receive a phone call 3 days later from the cardiologist who says that her C-reactive protein and antistreptolysin O titer were mildly elevated (due to her
strep throat); her echocardiogram and all other tests were normal, including her antinuclear antibody, urine analysis, repeat ECG and complete blood count, and chest radiograph. Treating her with oral amoxicillin and oral ibuprofen and adjunctive bed rest, led to her joints becoming less tender by the time of discharge. Her heart murmur was determined to be a benign functional flow murmur exacerbated by her hyperdynamic cardiac state due to fever.

On day 5 of her illness, however, she returns to your office with a more swollen and tender left ankle. She had also noticed a few red spots on her legs this morning. She has also started complaining of severe generalized abdominal pain and no appetite. Her fever has subsided, too.

Upon your physical examination, she is afebrile, her throat is normal, you can barely hear a heart murmur, but she now has a definite effusion and is still quite tender. Her urine analysis is completely normal, as is her complete blood count today. You now have your diagnosis: Henoch-Schoenlein purpura, which was atypically masquerading as severe arthralgia and abdominal pain as her initial presentation. Although controversial, because of the severity of the vasculitis in two other systems—the joints and the abdomen—you elected to start empiric therapy with oral prednisone at 2 mg/kg/day for 5 days. She returns to your office 2 days later, and her purpuric rash has abated some, the joint tenderness has almost resolved, her abdominal pain has subsided, and her appetite has returned to normal. You are both extremely pleased with her progress. Over the next month, the RN, repeat evaluations of her urine analysis, blood pressure, and heart and skin were completely normal.

CONCLUSION

Practitioners must be rigorous in their history taking and physical examination of pediatric patients. They must remain attuned to the concerns of the mother in particular, who can provide invaluable clues as to the significance of the illness in her children. The practice of rural pediatrics continues to be extremely challenging, both in diagnostic and therapeutic issues. Despite our exceptional vaccination rates, the number of rural children and teens seen annually with other types of severe or potentially life-threatening problems continues mostly unabated.

DENOUEMENT

I want to thank all of my regular and irregular readers for their support, and for their thoughtful and informative letters over the past 3 years of my monthly columns. I am relinquishing my monthly musings to take on a future part-time role in this wonderful erudite journal. Heartfelt thanks to Stan Shulman, MD, FAAP, Editor-in-Chief, for the honor of allowing me to partake in this prestigious forum and for the opportunity to express my humble views on general pediatric issues and problems.

REFERENCES

1. Block SL. Petechiae and purpura: the omni-


2. US Centers for Disease Control and Preven-

3. Niaudet P. Clinical manifestations and diagno-


6. Montague EC, Hilinski J, Andrensen D, Cool-


8. Block SL. What’s my line? Red streaks in pe-