Management of a Digital World: From Felons to Fungus

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Most practitioners think that rashes and lesions of the fingers are relatively straightforward to diagnose and manage. But you will likely encounter some real “sticklers” in your lengthy careers that will produce much consternation and confusion. You must be willing to consider the unusual diagnosis, pathogen, or medication response. Each one of the following eight cases will hopefully teach some of the nuances about the pediatric “digital” world. Unless otherwise stated, each of the following cases was age-appropriately fully vaccinated and had a normal physical examination and vital signs.

CASES

Case 1

This previously healthy 2-year-old white boy presented to your office with a painful blister on the lateral edge of the index fingertip within the past 24 hours (see Figure 1). The lesion is only slightly reddened at the base of the bullous lesion, which makes a herpetic whitlow less likely to be hiding underneath the bullous lesion. In addition, he has no history of or exposure to herpes simplex cold sores or lesions. It certainly appears to be a straightforward case of bullous impetigo — but is it? You decide to start empiric antibiotic therapy, but only after you have incised the lesion with a needle or blade and have also obtained a bacterial culture. When the lesion is unroofed, you do not observe any small circular fiery red herpetic-like lesions. However, you remember that for fingertip bullous lesions you must readjust your therapy specifically and accordingly. Why?

Case 2

A 12-year-old white girl presented to your office with both classic types of impetigo (Figure 2). The proximal lesion has burst, developing into typical impetigo, whereas the distal blister remains intact and is representative of the uncommonly observed bullous impetigo (similar to Figure 1).
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petiginous lesions: the honey-crusted red-based round flat lesion of impetigo simplex proximally, and the early singular pus-filled blister of “bullous impetigo” distally (see Figure 2, page 271). You are aware that most impetigo sores — even the bullous lesions — are caused by *Staphylococcus aureus*. However, about 10% to 25% may be also caused by *Streptococcus pyogenes*, either as a sole pathogen but mostly as a co-pathogen. Similar to most US locales, you also have observed a 75% rate of methicillin-resistant *S. aureus* (MRSA) among the *S. aureus* skin lesions in your area. Thus, you will most likely opt for antibiotic coverage of MRSA in this case, instead of a cephalosporin that only has coverage for both *S. pyogenes* and methicillin-sensitive *S. aureus*.1 For outpatients, choosing coverage for MRSA means choosing between a very poorly palatable antibiotic (clindamycin) or an antibiotic with no *S. pyogenes* coverage (trimethoprim-sulfamethoxazole [TMP-SMX]). The latter choice will often require obtaining a bacterial culture of the lesion, in case the pathogen is *S. pyogenes*. With the clindamycin choice, you must also keep in mind that occasional strains of MRSA have developed resistance as well.1 Thus, careful follow-up, at least by phone contact, over the next few days may be prudent.

Case 3

A 10-year-old healthy boy presented to your office with this very painful, mildly reddened lesion of the proximal lateral nail (see Figure 3). You surmise that it is a commonly observed paronychia, most of which are caused by *S. aureus*, and in particular MRSA. Thus, you elect to treat this patient similar to the child with impetigo in Case 2.

Case 4

By contrast, a previously healthy afebrile 4-year-old girl received a deep scratch 2 days ago from a cat. In the past 24 hours, the lesion has developed into a deeper, very painful “pointing” abscess of the index finger pad, which has swollen to double the size of the comparative middle finger (see Figure 4). She was unable to sleep last night. You remember something particularly worrisome about this type of finger pad lesion, but the details escape you. She has good range of motion of the finger but is in moderately severe pain at the fingertip. Not only must you decide which pathogen to target (as many other organisms are potential causes, especially after any bites or scratches2), but also whether to hospitalize the child. Why?

Case 5

A 4-month-old white girl has developed multiple small vesicles over her palms and soles (see Figure 5). She has had a fever to 102.5°F for the past 3 days and has been drinking poorly, drooling, and is very cranky. On physical examination, she has several small, round, centrally yellow, red-based blisters in her posterior pharynx and buccal mucosa. Although you contemplated a fleeting diagnosis of mucocutaneous herpes simplex infection, you are quite familiar with these particular patterns of lesions being part of the hand-foot-mouth syndrome caused by one of the many enteroviruses. You are quite comfortable with reassuring the family about your diagnosis, and for them to continue to administer acetaminophen and to force fluids into the baby.

Case 6

By contrast, a previously healthy 10-year-old black girl from rural Kentucky has developed a quite ominous set of petechiae on her palms and soles, along with a low-grade fever and sore throat (see Figure 6, page 273). Interestingly, on physical examination, she also has a few small vesicles in her posterior pharynx, similar to those described in Case 5. As most pediatricians know, a heavy crop of petechiae might portend more serious disease processes and infections, such as
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Rocky Mountain spotted fever (RMSF), meningococcemia, idiopathic thrombocytopenia (ITP), leukemia, etc. You order a complete blood count, blood cultures, and comprehensive metabolic panel. This type of petechial rash always makes you exceedingly nervous.

Case 7
The erosive-looking pruritic but only slightly erythematous rash on the index finger is quite perplexing in this otherwise healthy 7-year-old black boy, as you expected either the steroid or antifungal cream (miconazole) to dissipate the rash. However, it has continued to worsen over 3 weeks to the current status as seen in Figure 7. Is a trial of antistaphylococcal antibiotics needed? You also consider the possibility that this could be a severe herpetic infection.

Case 8
This 4-year-old otherwise healthy white boy presents to your office with a constellation of findings that seem to fit no particular pattern. He has a history of fever, sore throat, and fine red maculo-papular rash on his abdomen and axilla for the past 24 hours, along with a “bubbly” clear, vesicular pruritic rash localized mostly on his hands and feet for the past 48 hours (see Figure 8, page 274). Besides the rashes, his physical examination reveals only a red pharynx and mildly swollen, tender anterior lymphadenopathy. A rapid strep test confirms that he has strep throat, but you are still befuddled by his extremity rash, which is definitely not a part of his scarlet fever-like rash on the trunk. You initiate therapy with amoxicillin for strep and cetirizine for itching. You are undecided as to whether to start oral steroids.

RESOLUTION OF CASES 1, 4, 6, 7, 8

Case 1 (Figure 1)
This child’s solitary lateral purulent blister of the distal finger is caused by “blistering distal dactylitis.” The causative pathogen in most cases is solely S. pyogenes. Thus, your antibiotic choice must avoid the use of TMP-SMX, which although appropriate for most MRSA outpatient infections, has absolutely no role in the treatment of S. pyogenes. You start an oral cephalosporin, and open up the blister and find that the culture grows S. pyogenes at 24 hours, confirming your suspicion.

Case 4 (Figure 4)
This child has an early, moderately severe finger infection termed “felon,” or pulp space abscess, which occurs most commonly on the thumb or index finger. Although the area of swelling, cellulitis, and redness is limited to distal phalanx early on, it can lead to “ischemic necrosis of surrounding tissue, osteomyelitis, flexor tenosynovitis [pain on any motion of the finger flexor tendon], or septic arthritis.” You easily open up the “pointing wound” by needle puncture, and express 3 mL of purulent material for culture. Your two dilemmas are now which antibiotic to choose and whether to hospitalize the patient. You decide that the accumulation of a large amount of purulent material this quickly most likely indicates a gram-positive infection, so you initiate outpatient therapy with oral clindamycin, which also might cover a potential bone infection as well. Although a cat scratch was involved, you decide to wait 24 to 48 hours before covering for Bartonella with azithromycin and before obtaining a finger radiograph, which is unlikely to show any bony changes so quickly. You ask the family to return the next day. The culture grows MRSA, but the mother, whom you learn works most days, does not return to the office the...
next day. She does not return your phone calls over the weekend as you try to obtain an update on the infection. You had considered hospitalization if the child did not improve. Finally on Monday, your phone nurse learns per the mother (much to your relief) that the child is doing extremely well and is taking the medication without problem.

Case 6 (Figures 6A and 6B)

Every child with notable petechiae must be thoroughly evaluated; up to three-fourths of children with petechiae in a German series were hospitalized.4 When you determine that this child has no meningismus, fever, or purpura; acts healthy; has a normal leukocyte count with an absence of bands and with normal platelets; and has normal sodium and liver functions, you feel relieved. He also has the classic herpangina oral lesions. You know that this is almost assuredly not RMSF, meningococemia, or leukemia.5,6 Your literature search shows that enteroviruses, particularly echovirus 9 and Coxsackie A9 strains, account for up to 12% of strictly petechial rashes.4,6 You still request follow-up the next morning to re-examine the child for any changes.

Case 7 (Figures 7A and 7B)

Despite the lack of any response to topical antifungals, you are seeing a notable number of cases of skin fungal infections unresponsive to the usual topical antifungals. You strongly think that this is probably fungal (eg, Trichophyton rubrum) and a deeper seeded infection, such as “Majocchi’s granuloma” (which is like a kerion or deeper infection of the hair follicles).6 Therefore, you empirically start oral griseofulvin at ultramicrowave 20 mg/kg/day as a single dose with a fatty meal for the next month. At follow-up in 7 days, you observe a much improved rash, with nearly total resolution and surprisingly minimal scarring, despite the somewhat cratered appearance seen earlier (see Figure 7A, page 273).

Case 8 (Figures 8A and 8B)

The acrodermatitis rash did resolve over 3 weeks, unlike the scarlet fever rash that resolved in 48 hours. You elected not to treat with steroids initially in light of the streptococcal infection. You did not figure out the etiology of this child’s rash for nearly 1 year, until you saw an identical case at a pediatric continuing medical education course. This was a case of Gianotti-Crosti syndrome (GCS), or papular acrodermatitis. This particular vesicular pruritic appearance is a variation known as “papulovesicular acro-located syndrome.”6 GCS is associated with many viruses (eg, Epstein-Barr and enterovirus). Current literature suggests that it is rarely ever associated with hepatitis B virus, as it was in many older case series. Interestingly, it has been associated with bacterial infections such as cat scratch disease, mycoplasma, and S. pyogenes, which was the situation in this child. The rash may last from 10 days to 12 weeks.5,6 The primary differential diagnosis is acrodermatitis enteropathetica due to zinc deficiency. General treatment of GCS includes emollients and antihistamines.

REFERENCES