

PedsCases Podcast Scripts

This is a text version of a podcast from PedsCases.com on the “Approach to Pediatric Rashes.” These podcasts are designed to give medical students an overview of key topics in pediatrics. The audio version are accessible on iTunes or at www.peds-cases.com/podcasts.

Approach to Pediatric Rashes

Developed by Dr. Peter Gill and Dr. Irene Lara-Corrales for PedsCases.com

July 12, 2015

Introduction

Hi everyone, my name is Dr. Peter Gill, a pediatric resident at the Hospital for Sick Children at the University of Toronto. This podcast was developed with Dr. Irene Lara-Corrales, a pediatric dermatologist at The Hospital for Sick Children and Assistant Professor at the University of Toronto.

This podcast is the first in a series of podcasts on rashes in children. To start, this podcast is designed to give an approach to assessing rashes in children. Next, we will have several podcasts about common dermatological conditions in children so stay tuned!

Before we begin, let’s start with a clinical case. You are completing your ambulatory clinic portion of your pediatric rotation. Your preceptor tells you to go see an 11-month old boy with a rash. She asks you to take a history, examine the patient with particular emphasis on the rash, and return when you are finished to present the case and describe the rash. A feeling of panic seeps into your chest, how the heck are you supposed to describe a rash? What terms are you supposed to use?

As a medical student, and in nearly every area in medicine, you will see patients with rashes. In pediatrics in particular, rashes are common; about 30% of consultations in a pediatric setting are related to the skin. You are not alone in feeling your throat dry up when asked to describe a rash. At first, the task seems daunting. In fact, sometimes you know the diagnosis but are at a loss for how to describe what you are seeing.

Learning an approach to pediatric rashes is vital. Think of it like learning how to describe a work of art to someone over the phone – you need to learn how to paint a picture with words. To do this well, you need to learn the terminology of dermatology. Therefore, the objectives of this podcast are to:

- 1) Learn how to describe primary lesions.
- 2) Learn how to describe secondary lesions.

- 3) Develop a simple approach to assessing rashes in children, including pertinent features on history and physical exam.
- 4) Develop a methodological system to accurately describe a lesion.

Now let's get started.

History

In children that present with a rash, the history is key. It is helpful to conceptually divide the history into two main categories: first, the history of the rash; and second, the general history.

First, ask the parents or caregiver to explain the primary reason for presenting. Getting to the root of why parents brought their child to medical attention is important. For example, is it because their child will not stop scratching or that a neighbor's child had a similar rash and is now in hospital?

Now focus on the rash. When did it start? Where did it start? Has the rash changed over time? Does the rash look the same now as it did when it initially erupted? Did the rash go away, then return? Is it getting better, or worse? Does the rash involve the mouth and genitals, nails or hair? Has the child ever had the rash before?

Next, determine if there are any associated symptoms. In particular, ask whether the rash is itchy, and clarify if it was itchy *before* the rash started, or after. Determine if there is any pain or abnormal sensation. Are there any nocturnal symptoms? Ask about alleviating and aggravating factors. For example, is the rash worse in the sun or does it change with temperature or contact with certain materials? Have the parents tried any creams or ointments, and if so has it made it better or worse?

It is important to find out if the rash is associated with a fever. The presence of fever suggests a particular set of differential diagnoses. Are there any other associated infectious symptoms such as cough, runny nose, sore throat, vomiting or diarrhea? Ask about any sick contacts at home, if the child goes to daycare and if there was any recent travel out of the country.

Think about potential precipitants. Has the child started a new medication or several medications? If any medications have been started, it is also important to determine when medications were started and for what reason. Has he recently been immunized? Has the family changed any skin products at home?

Ask about the child's past medical history, in particular a history of atopy or eczema, asthma or allergies. Determine if the child is on any medications, has any drug allergies and is fully immunized. Ask about a family history of medical conditions, including atopy, psoriasis and melanoma.

Once you have finished taking the history, try to come up with a story or narrative about the rash. Take a moment to re-summarize and tell the story back to the parents. This is

a helpful way to ensure you have captured the history accurately, and gives the parents a chance to correct you in case you have not.

Physical Exam

In all patients, complete a general assessment from the bedside to ensure they are clinically stable. Are they well, unwell or sick appearing? Is the child pale, jaundice or flushed? Check the vital signs.

Next, complete a detailed skin exam which includes examining *all* the skin and its appendages like hair and nails. Do not forget to check behind the ears, on the scalp, soles of the feet, the axilla and the inguinal region. Also, examine the nails and mucous membranes, looking at the soft and hard palate for findings such as palatal petechia in Strep throat.

There are four core steps to evaluating rashes: 1) type of lesion, either primary or secondary lesion; 2) color and shape; 3) arrangement; and 4) distribution. We will go through each of them in detail next.

First, determine whether there are **primary** or **secondary** lesions. Let us take a moment to explain what the difference is between primary and secondary lesions.

Primary lesions are directly related to the underlying disease process while **secondary lesions** are modifications to primary lesions that occur with trauma, infection or other external factors. Let's start with primary lesions.

A macule is a flat, non-palpable lesion measuring less than 1 cm in diameter. An example of a macule is a café au lait macule. When a lesion is flat, non-palpable but greater than 1 cm in diameter, it is referred to as a patch. An example of a patch is a Mongolian spot otherwise known as a dermal melanosis commonly seen on dark skinned newborn infants. If you close your eyes and feel the skin, and you are not able to touch what you are seeing, it is likely to be a macule or a patch depending on the size.

A papule, on the other hand, is a well-defined, elevated lesion measuring less than 1 cm in diameter. A commonly seen papule is a wart. A plaque is a well-defined, plateau-like lesion greater than 1 cm in diameter. An example is a nevus sebaceous. Both papules and plaques are palpable.

Similar to a papule, a nodule is a well-defined, elevated lesion, measuring less than 1 cm in diameter but nodules also have depth; if the diameter is greater than 1 cm, it is called a tumor. A dermoid cyst is an example of a nodule while a hemangioma is a commonly seen tumor. A wheal is a flat-topped elevated lesion with induration and palpable edema seen commonly in acute urticaria secondary to infections or allergic reactions.

A vesicle is a well-defined fluid filled lesion less than 1 cm in diameter. Herpes simplex lesions are examples of vesicles. A bulla is a well-defined fluid filled lesion greater than 1 cm in diameter, such as bullous impetigo. In contrast, pustules are pus-filled lesions that can be seen with infections like folliculitis, but other times can be non-infectious, like in transient pustular melanosis.

Time for a quick recap. The main primary lesions are differentiated by whether they are palpable, by their size and by whether they are solid or fluid filled. These are caused directly by a skin process. Now let's move on to secondary lesions. Secondary lesions can evolve from primary lesions or be the result of scratching, trauma to the skin, healing of the skin or infections.

One of the most common secondary lesions seen in children is crusting which results from dried exudate overlying an impaired epidermis. The classic golden crusts are often seen in children with facial impetigo. Scaling is due to increased shedding or accumulation of stratum corneum, classically seen in psoriasis.

Chronic scratching from atopic dermatitis leads to three types of secondary lesions: lichenification, excoriations and fissures. Lichenification is the thickening of the epidermis with exaggeration of the skin markings. Excoriations are superficial skin abrasions while fissures are linear, painful breaks in the skin.

Erosion is the intra-epithelial loss of epidermis that does not leave scarring. This occurs in herpes after a vesicle sloughs off. On the other hand, an ulcer is the full-thickness loss of epidermis which heals with scarring. This is seen with pressure ulcers and pyoderma gangrenosum.

The last common type of secondary lesion is atrophy or the loss of skin thickness. If only the epidermis is affected, the skin becomes more translucent and wrinkled. If the dermis is affected, there is depression of the skin. There are several other types of secondary lesions but we will stop here in the interest of time. Don't worry, you'll be off to a good start if you can learn the ones we mentioned.

After you determined whether the lesion is primary or secondary, determine its color. Is it skin-colored, red, pink, violaceous, white, brown, black or blue? Is the entire lesion the same color, or are there lesions of various colors?

After color, classify the shape of the lesion. Is it round, oval, annular, serpiginous or dermatomal? Annular refers to round target like lesions, serpiginous refers to 'snake-like' or wavy and angulated, while dermatomal suggests the rash is defined to a particular dermatome, such as in shingles or herpes zoster.

After color and shape, your next job is to describe the arrangement of the rash. Are the lesions grouped or herpetiform? Are they annular or ring-shaped like in tinea corporis? Are they nummular or coin-shaped like nummular dermatitis? Are they targetoid such as erythema multiforme?

Lastly, determine the distribution. Is the rash generalized, localized or regional (such as peripheral extremities only)? Is there any particular pattern to the rash? For example, is it only in sun-exposed regions, linear, or on pressure sites?

Phew, you are done. Let's recap. After your general assessment of the patient, first determine whether the rash is a primary or secondary lesion. Then describe the color and shape, the arrangement and the distribution. Do not forget to examine the entire patient including hair, nails, mucosas, behind the ears and in-between the fingers and toes. As with all assessments, complete a general physical examination of the cardiovascular, respiratory and abdominal system.

A useful mnemonic for describing skin lesions is SCALDA which stands for **S**ize, **C**olour, **A**rrangement, **L**esion morphology, **D**istribution and **A**lways check the hair, nails, mucous membranes and in between fingers and toes. Think of it this way, after seeing a patient with a rash, you do not want to get scalded for poorly describing the rash. SCALDA.

Conclusion

Now let's review our clinical case. Your patient is an 11-month old boy. Fortunately, the clinic nurse collected his vital signs which are: HR of 126 beats per minute, RR of 32 breaths per minute, BP of 81/40 with an axillary temperature of 37.1°C. You walk into the room and complete a foot of the bed assessment. The infant is crawling on the floor, playing with toys. For the past 4 days, the toddler has had a high fever with a maximum temperature of 39.5°C. He was a bit more lethargic than normal, but was still drinking and eating. There were no associated symptoms. All of the sudden this morning, the fever went away but he developed a rash over his entire body. On further examination, you notice multiple discrete macules and papules light pink in color which are generalized. The lesions are blanchable and do not appear itchy. The rest of the exam is unremarkable. You leave the room and present the case to your preceptor, and given your astute description, your preceptor thinks it is roseola due to human herpes virus 6 infection. Physical exam with your preceptor confirms the diagnosis, and no treatment is required.

This concludes our podcast. Before we finish, here are a few take-home points:

- 1) Pediatric rashes are common, and it is important to have a consistent and methodological approach to describe them.
- 2) Taking a pertinent and focused history, both of the evolution of the rash and of the patient, are important as they provides clues to the underlying etiology.
- 3) Determine whether the rash represents primary or secondary lesions. The main primary lesions include a macule or patch, papule or plaque, nodule or tumor, vesicle or bullae, or wheal. The main secondary lesions in children are crusting, fissure, excoriation, lichenification, ulcer, erosion and atrophy.
- 4) Lastly, determine whether the rash fits into a classic shape, arrangement or distribution.

Thanks for listening and stay tuned for more podcasts on rashes.

References

Joseph MO, Pope E. Chapter 12: Dermatology. In: Dipchand A, Friedman JN, Gupta S, Bismilla Z and Lam C, editors. The Hospital for Sick Children Handbook of Pediatrics. 11th ed. Toronto: Saunders Canada; 2009.

Weinstein M, Lee M, Su J. Guide to Rotation in Dermatology Hospital for Sick Children. Dermatology History and Exam: Comprehensive inventory of all relevant dermatology history questions. Revised July 2013.

Heng M, Greenwald JA. Toronto notes (2014). 29th ed. Toronto. Toronto Notes for Medical Students, Inc.; 2014

Filate W, Leung R, Ng D, Sinyo M. Essentials of Clinical Examination Handbook. 5th ed. Toronto Notes for Medical Students, Inc.; 2005

Kleigman RM, Marcante KJ, Jenson HB, Behrman RE. Nelson essentials of pediatrics. 5th ed. Philadelphia. Elsevier Inc.; 2006.