

A 9-year-old boy is brought to the physician with fever, hives, and joint pain. The pruritic rash began 2 days ago and has spread to cover his trunk and arms. Today, the boy has been having pain in the wrists and ankles. He is currently taking oral penicillin for streptococcal pharyngitis that was diagnosed 9 days ago. His temperature is 38.8 C (101.8 F). Physical examination shows an ill-appearing boy with a diffuse **rash on the arms** and back. There are palpable lymph nodes in the cervical, axillary, and inguinal regions. The wrists and ankles are tender to palpation but are not swollen or erythematous. The remainder of the physical examination is normal. Which of the following is the most likely diagnosis?

- ☐ A. Acute rheumatic fever
- ☐ B. Anaphylaxis
- ☐ C. Henoch-Schönlein purpura
- ☐ D. Infectious mononucleosis
- ☐ E. Scarlet fever
- ☐ F. Serum sickness-like reaction
- ☐ G. Stevens-Johnson syndrome

Media Exhibit

1 of 1



A 9-year-old boy is brought to the physician with fever, hives, and joint pain. The pruritic rash began 2 days ago and has spread to cover his trunk and arms. Today, the boy has been having pain in the wrists and ankles. He is currently taking oral penicillin for streptococcal pharyngitis that was diagnosed 9 days ago. His temperature is 38.8 C (101.8 F). Physical examination shows an ill-appearing boy with a diffuse **rash on the arms** and back. There are palpable lymph nodes in the cervical, axillary, and inguinal regions. The wrists and ankles are tender to palpation but are not swollen or erythematous. The remainder of the physical examination is normal. Which of the following is the most likely diagnosis?

- ☐ A. Acute rheumatic fever [27%]
- ☐ B. Anaphylaxis [4%]
- ☐ C. Henoch-Schönlein purpura [4%]
- ☐ D. Infectious mononucleosis [10%]
- ☐ E. Scarlet fever [10%]
- ☒ F. **Serum sickness-like reaction** [38%]
- ☐ G. Stevens-Johnson syndrome [6%]

[Proceed to Next Item](#)

Explanation:

User Id:

Serum sickness-like reaction	
Etiology	Antibiotics (β -lactams, sulfa) most common
Clinical features	<ul style="list-style-type: none">• Fever, urticaria & polyarthralgia 1-2 weeks after first exposure• Headache, edema, lymphadenopathy & splenomegaly less common
Treatment	<ul style="list-style-type: none">• Remove/avoid offending agent• Steroids for severe cases

©UWorld

This child's symptoms (fever, urticaria, and joint pain), which began after 1 week of penicillin therapy, are concerning for a **serum sickness-like reaction**. A serum sickness-like reaction is a type III hypersensitivity reaction that occurs 1-2 weeks after administration of **β -lactams** (eg, penicillin, amoxicillin, cefaclor) or **trimethoprim-sulfamethoxazole**. Classic manifestations include **fever, urticaria, and polyarthralgia** with no mucosal involvement. The patient typically appears ill.

Laboratory findings that support the diagnosis of serum sickness-like reaction include nonspecific hypocomplementemia and elevated inflammatory markers (erythrocyte sedimentation rate, C-reactive protein), which are consistent with any type III hypersensitivity reaction. **Removal** of the offending agent is generally sufficient to relieve symptoms within 48 hours. More severe cases may require glucocorticoid therapy. Although serum sickness-like reaction is not a true allergy, the offending agent should be **avoided** in the future to prevent recurrence.

(Choice A) Acute rheumatic fever can follow untreated streptococcal pharyngitis and may present with frank arthritis, **erythema marginatum**, and fever. Acute rheumatic fever after appropriate antibiotic therapy is extremely rare and highly unlikely in this treated patient.

(Choice B) Anaphylaxis presents acutely with skin changes plus hypotension, respiratory distress, or gastrointestinal symptoms. This child has had gradual onset of urticaria with no cardiopulmonary or gastrointestinal symptoms. This is in contrast to immediate (type I) hypersensitivity reactions in which symptoms appear rapidly after the exposure.

(Choice C) Henoch-Schönlein purpura is a systemic IgA-mediated vasculitis occurring after an upper respiratory infection. It presents with fever, arthralgia, and a **palpable purpuric rash** of the lower extremities. This child's rash is urticarial on the upper extremities, which is inconsistent with Henoch-Schönlein purpura.

(Choice D) Mononucleosis presents as fever, cervical lymphadenopathy, pharyngitis, and malaise. Those treated with an aminopenicillin can develop a morbilliform rash on the trunk. However, the rash typically spares the extremities and arthralgia does not occur.

(Choice E) Scarlet fever presents with fever and a scarlatiniform "**sandpaper**" rash following streptococcal pharyngitis. Neither urticaria nor arthralgia is associated with scarlet fever.

(Choice G) Stevens-Johnson syndrome is a severe mucocutaneous reaction most commonly triggered by medications (eg, sulfa drugs, anticonvulsants). Affected patients develop acute high fever, vesicular or **bullous lesions**, and painful hemorrhagic oral

(Choice A) Acute rheumatic fever can follow untreated streptococcal pharyngitis and may present with frank arthritis, **erythema marginatum**, and fever. Acute rheumatic fever after appropriate antibiotic therapy is extremely rare and highly unlikely in this treated patient.

(Choice B) Anaphylaxis presents acutely with skin changes plus hypotension, respiratory distress, or gastrointestinal symptoms. This child has had gradual onset of urticaria with no cardiopulmonary or gastrointestinal symptoms. This is in contrast to immediate (type I) hypersensitivity reactions in which symptoms appear rapidly after the exposure.

(Choice C) Henoch-Schönlein purpura is a systemic IgA-mediated vasculitis occurring after an upper respiratory infection. It presents with fever, arthralgia, and a **palpable purpuric rash** of the lower extremities. This child's rash is urticarial on the upper extremities, which is inconsistent with Henoch-Schönlein purpura.

(Choice D) Mononucleosis presents as fever, cervical lymphadenopathy, pharyngitis, and malaise. Those treated with an aminopenicillin can develop a morbilliform rash on the trunk. However, the rash typically spares the extremities and arthralgia does not occur.

(Choice E) Scarlet fever presents with fever and a scarlatiniform "**sandpaper**" rash following streptococcal pharyngitis. Neither urticaria nor arthralgia is associated with scarlet fever.

(Choice G) Stevens-Johnson syndrome is a severe mucocutaneous reaction most commonly triggered by medications (eg, sulfa drugs, anticonvulsants). Affected patients develop acute high fever, vesicular or **bullous lesions**, and painful hemorrhagic oral erosions.

Educational objective:

Serum sickness-like reaction is most commonly caused by β -lactams and sulfa drugs. Symptoms arise 1-2 weeks after exposure and include fever, urticarial rash, arthralgia, and lymphadenopathy. The abnormalities should resolve with withdrawal of the offending agent.

References:

1. **Urticaria mimickers in children.**
2. **Serum sickness-like reaction to cefuroxime: a case report and review of the literature.**

Media Exhibit

na marginatum (rheumatic fever)



Media Exhibit

-Schönlein purpura



Media Exhibit

ems scarlet fever



Media Exhibit

ems scarlet fever



Media Exhibit

