Photo Quiz

An Annular Rash

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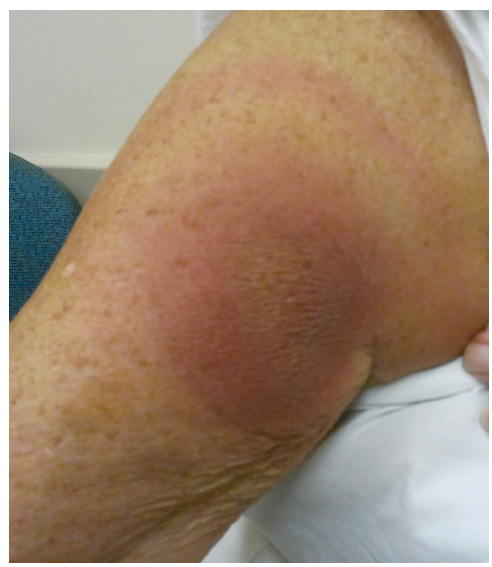

Figure.

A 72-year-old woman presented with an insect bite on her right upper extremity. She first noticed the bite approximately five days before presentation. Over the subsequent five days, the rash enlarged and became more red, swollen, and painful. The center of the rash was warm and tender. She had nausea that began two days after the bite. She did not have fever, sore throat, joint aches, or body aches. She had a history of hypertension, gastroesophageal reflux disease, hyperlipidemia, and osteoarthritis. She had no history of atopic dermatitis.

Examination revealed a solitary, 9-cm, indurated, violaceous, mildly tender plaque on the right anteromedial portion of the deltoid. A 14-cm red ring surrounded the central tender area of the rash *(see accompanying figure)*. She did not have lesions on her palms, soles, feet, or elbows.

Question

Based on the history and physical examination findings, which one of the following is the most likely diagnosis?

- ❏ A. Erythema multiforme.
- ❏ B. Granuloma annulare.
- ❏ C. Lyme disease.
- ❏ D. Nummular eczema.
- ❏ E. Rheumatic fever.

See the following page for discussion.

Discussion

The correct answer is C: Lyme disease. Lyme disease can be contracted from a deer tick (*Ixodes*) bite containing *Borrelia* species of bacteria. Erythema migrans is the pathognomonic skin finding associated with Lyme disease and is often described as a bull's-eye or target rash. It typically is an annular, erythematous plaque with central clearing. Lyme disease can be associated with myalgias and arthralgias, fever, anorexia and nausea, fatigue, and regional lymphadenopathy, but the rash may be the only finding at presentation.

Lesions are usually 5 to 68 cm, although they can vary in size.[1] They appear three to 30 days after the tick bite, but most commonly within seven to 14 days. The classic lesion occurs in approximately 80% of cases.[2] Lyme disease has been reported in all 50 states but is endemic in the Northeast and in parts of Minnesota, Wisconsin, and northern California.[3] Most cases occur from May to September when the *Ixodes* tick is in the nymph stage.

Summary Table

Condition	*Cause*	*Characteristics*
Erythema multiforme	Hypersensitivity reaction to medication use or an infection, such as herpes simplex virus infection	Papules or plaques with erythematous borders; usually located on the palms, soles, elbows, or knees
Granuloma annulare	Idiopathic and benign	Skin-colored plaques or papules on distal portions of the extremities; typically occurs between 40 and 50 years of age
Lyme disease	*Borrelia* species of bacteria transmitted by a deer tick bite	Annular, erythematous plaque with central clearing; described as a bull's-eye or target rash
Nummular eczema	Idiopathic but associated with asthma and atopic dermatitis	Papulovesicular, coin-shaped lesions
Rheumatic fever	Complication of group A streptococcal infection	Annular rash; slightly elevated, mildly erythematous, and nonpruritic; primarily appears on extensor surfaces of extremities; spares the face

There are three distinct clinical stages of Lyme disease. The early localized stage (three to 30 days after tick exposure) includes the influenza-like symptoms of fever, fatigue, arthralgias, and myalgias. The early disseminated stage (days to weeks after tick exposure) includes multiple lesions, neurologic symptoms (palsies, radiculopathy, or peripheral neuropathy), or cardiac symptoms (myocarditis and varying degrees of atrioventricular block). The late stage (months to years after tick exposure) includes arthritis, primarily affecting the knee, and possible cognitive disturbances. Treatment should be initiated promptly to avoid progression to late stages of the disease.

Erythema multiforme is a hypersensitivity reaction to medication use or an infection, such as herpes simplex virus infection.[4,5] It typically manifests as papules or plaques with erythematous borders. The target or iris lesions typically appear on the palms, soles, elbows, or knees.

Granuloma annulare is a benign, self-limited, annular eruption that does not require treatment. It presents as skin-colored plaques or papules on distal portions of the extremities, specifically the hands, wrists, and feet. It is idiopathic and occurs in adults and children, although it is most common between 40 and 50 years of age. It is more common in women than in men.[6]

Nummular eczema is an idiopathic papulovesicular dermatitis commonly associated with asthma and atopic dermatitis. It typically manifests as coin-shaped lesions and is most prominent in cold or dry months.

Rheumatic fever is an inflammatory disease that can develop after group A streptococcal infection and is associated with erythema marginatum. This annular rash is typically slightly elevated, mildly erythematous, and nonpruritic, and is primarily found on extensor surfaces of extremities, sparing the face.

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