Child Presenting With Recurrent Cutaneous Abscesses

Question
What is the most specific and practical work-up for a child (12 years old) who has recurrent cutaneous abscesses? The last one cultured out methicillin-resistant *Staphylococcus aureus* (MRSA).

Response from James E. Gern, MD
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Recurrent cutaneous abscesses can be caused by particularly virulent pathogens, immune deficiencies, or primary dermatologic conditions. If MRSA has been cultured from the abscess, it suggests that the former may be the most likely explanation. This type of organism is, by definition, resistant to treatment with many of the standard antibiotics, and sensitivities should be performed to direct therapy. Especially in a child, it is important to treat until multiple cultures are negative to establish that the infection has indeed resolved. It is also important to search for a reservoir where the bacteria may be "hiding" between infections. The nasopharynx is the most common reservoir (and this area should be cultured), although occasionally a pet or another family member or playmate can carry the bacteria.

Immune deficiency should also be considered, since neutrophil-killing disorders such as chronic granulomatous disease (CGD) are typically associated with recurrent abscesses of the skin. Clues for an immune deficiency would be a history of abscesses in other closed spaces (lung, sinuses, etc), or periodontal disease. If CGD is suspected, a complete blood count should be obtained, along with a differential to calculate the absolute neutrophil count. The blood smear should be evaluated to assess neutrophil morphology, which is abnormal with some immune deficiencies. Finally, superoxide production, which is an important tool for killing bacteria and fungi, can be screened with the nitroblue tetrazolium (NBT) test. This test involves incubating fresh peripheral blood cells with a colorless dye (formazan), which turns blue when cells are activated in the test tube.

Dermatologic diseases can also present with either abscesses or pustules that closely resemble abscesses. In addition, some dermatologic diseases, such as atopic dermatitis, are associated with an enhanced susceptibility to infections, particularly with *Staphylococcus* and *Streptococcus*. Finally, hidradenitis suppurativa can be recognized by a typical distribution of cutaneous abscesses corresponding with apocrine sweat glands. It is uncommon before puberty, and is sometimes associated with inflammatory bowel disease.

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