

## GROUP A STREPTOCOCCUS OSTEOMYELITIS AND SEPTIC ARTHRITIS FOLLOWING VARICELLA: CASE REPORT AND REVIEW OF THE LITERATURE

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Varicella (chickenpox) is a common pediatric disease which usually follows a benign course. Approximately three to four million children are affected annually in the United States. Complications are not common in immunocompetent children. When they do occur, they are usually secondary to bacterial superinfections of the skin lesions, or as a result of bacteremia. Skin and soft-tissue infections are the most common complications.<sup>1</sup> Pneumonia and central nervous system (CNS) involvement are less frequent, and skeletal and joint complications are rare.

### Case Report

A previously healthy 10-year-old female was seen at our hospital with fever and pain in her right ankle. She had had varicella two weeks prior to presentation. She had developed pain in the right knee joint three days after the start of varicella lesions. The pain resolved over the next few days, however, 10 days later she started to have pain, swelling and redness around her right ankle joint. She was unable to bear weight on her right leg. At the same time, she had a low-grade temperature and reduced appetite. There was no history of trauma or recent throat infection.

Physical examination revealed an alert young girl in moderate pain, with a temperature of 38.5°C. Examination of the head, neck, chest, heart and abdomen was normal. Healing varicella lesions were evident on the skin. The right leg showed a red, swollen ankle joint which was tender to palpation, with very limited range of movements. The rest of her joint examination was unremarkable. A complete blood count showed hemoglobin of 124 g/L, WBC of 21,900x10<sup>9</sup>/L with 86% neutrophils, 6% lymphocytes, and sedimentation rate of 52 mm/h. An x-ray of the right ankle showed significant soft tissue swelling, however, no bony lesion was seen. A needle aspiration of the right ankle joint was performed, and 0.5 cc of cloudy

fluid was obtained. Gram stain of the joint fluid showed 1+ gram-positive cocci and 1+ white blood cells. Cell count on the joint aspirate showed no RBCs, but the WBC count was 300,000/mm with 92% neutrophils and 8% monocyte. The culture of the synovial fluid grew group A  $\beta$ -hemolytic streptococcus. A blood culture taken at the time of admission was negative. Technetium bone scan showed an increased uptake in the right talus bone, which was consistent with osteomyelitis.

Initially, the patient was treated with intravenous cloxacillin, but after the culture results, therapy was changed to penicillin at a dose of 50,000 units/kg/dose every 6 hours intravenously. The patient was treated for two weeks with intravenous penicillin, then changed to oral penicillin for four weeks. The patient did well and her ESR normalized six to seven weeks after her initial presentation. The serum inhibitory level (SIL) and the serum bactericidal level (SBL) were both 1/4096 on oral penicillin, at a dose of 100 mg/kg/day. The patient recovered completely.

### Discussion

With the high prevalence of varicella in childhood, major complications in immunocompetent hosts are uncommon. Of possible complications, bacterial soft-tissue infections are the most frequent.<sup>1,2</sup> Other rarer complications include pneumonia and encephalitis.<sup>1-3</sup> Osteomyelitis is a rare complication of varicella.<sup>2,4,5</sup> *Staphylococcus aureus* and group A  $\beta$ -hemolytic streptococcus are responsible for the majority of joint and skeletal infections.<sup>2,4-7</sup> Vugia et al.<sup>1</sup> noted that the persistence of fever beyond four days of the development of skin lesions may be indicative of invasive infections caused

TABLE 1. Clinical characteristics of the current and the three reported cases of osteomyelitis and septic arthritis.

Age (yrs)/sex	Infection site	Hospital stay	Recovery
10/F*	Rt. ankle/talus	14 days	Complete
2/F	Lt. hip, tibia, rt. humerus, rt. knee, both elbows	44 days	Complete
5/F	Rt. ankle, talus	14 days	Complete
1/F	Lt. radius, lt. femur and knee	5 days	Complete

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by group A  $\beta$ -hemolytic streptococcus. Guess et al.<sup>3</sup> found that bacterial complications are most frequent among preschool children, while encephalitis and Reye's syndrome are most common in children between 5 and 14 years of age. Arthritis in patients with varicella is usually aseptic, but pyogenic arthritis alone resulting from staphylococcal or streptococcal species has been well documented before.<sup>6</sup>

A review of the literature shows 12 reported cases of osteomyelitis where group A  $\beta$ -hemolytic streptococcus was isolated from the skin lesion or from the blood culture.<sup>2,4,6,7</sup> To our knowledge, septic arthritis with osteomyelitis post-varicella has only been reported in three previous cases.<sup>7</sup> In all three cases, as well as in our own, group A  $\beta$ -hemolytic streptococcus was the causative organism. The source of bacteria is either by direct extension from the infected varicella lesion, or from hematogenous spread. In all the cases mentioned, treatment was successful and resulted in complete resolution of the infection. Table 1 shows the features of these cases.

Penicillin remains the drug of choice for documented group A streptococcal infection cases. While osteomyelitis

and arthritis are rare complications of varicella, this case and previous reports serve to alert the physician to an early diagnosis and management of this serious bone infection. With the inclusion of varicella vaccine as part of a routine immunization to young children, these serious and life-threatening complications should disappear.

### References

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