

# Rate of Concomitant Cellulitis and Osteoarticular Infections in a Pediatric Population

Claire Ryan, MD; Matthew Ellington, MD; Christopher Souder, MD

The University of Texas at Austin, Austin, TX



**Recipient:** Claire Ryan, MD

**Purpose:** Concern for infection is a common presentation in pediatric emergency departments with cellulitis being one of the most common infections encountered. Cellulitis is frequently treated with antibiotics alone with the rare need for surgical intervention. This is in comparison to pediatric musculoskeletal infections. These common occurrences have the potential to cause rapid destruction and long-term sequelae if not treated promptly and appropriately. Advanced imaging prior to surgical intervention is frequently used in the treatment of deep infections. Within our institution, we have noted that clinical signs consistent with cellulitis commonly lead to a workup for deep musculoskeletal infections despite a lack of evidence to suggest that the two entities commonly co-exist. The aim of this study is to identify the rate of concomitant cellulitis with osteomyelitis or septic arthritis.

**Methods:** A retrospective study was performed of 482 patients at a single, tertiary care institution undergoing MRI to evaluate for deep infection from January 2008 to December 2018. Charts were reviewed for clinical signs of cellulitis as documented in the admission history and physical exam note. MRI reports were then examined, and findings of cellulitis and/or deep musculoskeletal infections were recorded. The data was analyzed to determine the incidence of concomitant cellulitis with deep infection.

**Results:** Of the 482 patients undergoing MRI, 238 had documented signs of cellulitis. Of these, 52 cases (10.8%) were found to have both cellulitis upon clinical presentation and an associated deep musculoskeletal infection on MRI. On the basis of location, 92.3% were found to be involving bone in the subcutaneous location of the hand and wrist or the foot and ankle (GROUP 1). There were 116 cases in Group 1 with 48 cases (41.4%) of concomitant cellulitis and deep infection. The remaining skeletal sites (Group 2) consisted of 122 cases with four cases (3.3%) of concurrent cellulitis and deep musculoskeletal involvement. A significant difference in the rate of concomitant cellulitis and deep osteoarticular infections were found based on location ( $p < 0.0001$ ).

**Conclusion:** When cellulitis is seen in the areas of the hand and wrist as well as the foot and ankle, there is a

greater than 40% chance of a deep musculoskeletal infection. This is compared to the remaining skeletal sites in which a rate of just over 3% of concomitant cellulitis and deep osteoarticular infection was found. The index of suspicion for additional deep involvement of the musculoskeletal system should be high when cellulitis is seen in the distal extremities. Yet, when found on the other areas of the body, a low likelihood of deep infection is present and advanced imaging may not be indicated at initial presentation.

*The Mission of the AAP Section on Orthopedics is to foster the health of children through the AAP by mentorship, education, advocacy, and research. The AAP Section on Orthopedics has also collaborated with POSNA in joint leadership meetings creating shared strategic plans. Through these shared visions and collaborations our organizations have collectively partnered with the 50,000 pediatricians within the AAP to advocate for injured and ill children throughout the world.*