

# A Tale of Three Diagnoses: Pediatric Polyarthralgia

Kelsey Bacidore, MD; Cassandra Ward, DO

Department of Emergency Medicine, Loyola University Medical Center

## History

- 4 y/o F presented to the ED with 2 weeks of migrating intermittent joint pain and refusal to bear weight on the left leg for 24 hours
- Two weeks prior, she refused to bear weight on her right leg and URI symptoms were noted. She was diagnosed with and treated for rhinovirus, parapertussis and transient synovitis

## Exam

- Left leg was held in extension and attempts at ROM testing of both the hip and knee were resisted
- Tenderness over the lateral hip and anterior knee
- No erythema or effusion over either joint
- Patient did not appear toxic
- Similar to exam 2 weeks prior

## Differential Diagnosis

- Septic Arthritis
- Transient Synovitis
- Juvenile Idiopathic Arthritis
- Osteomyelitis
- Abscess
- Legg–Calvé–Perthes
- SCFE
- Benign/Malignant Tumor
- Developmental Dysplasia

## Work Up

- XRs: effusion of left knee
- Labs: ↑CRP; ESR, WBC wnl
- Ortho consult: difficult to interpret if pain is coming from the hip or knee
  - US of hip and knee ordered
  - Hip US: effusion
  - ¼ classic Kocher criteria but ESR right below cutoff, subjective fever at home, taking ibuprofen
  - Modified Kocher Criteria: CRP + inability to bear weight yields higher probability of septic arthritis



**Bilateral Hip Ultrasound**

## Hospital Course

- Taken to the OR for aspiration and washout, followed by IV abx
- Synovial fluid analysis: WBC 126,000 -> septic arthritis diagnosed
- Cultures were ultimately negative

## Post-Discharge

- She continued to have intermittent joint pain and was seen by rheumatology where she was diagnosed with juvenile idiopathic arthritis.

## Discussion

- Modified Kocher criteria (aka Caird's) is valuable in distinguishing septic arthritis of the hip from transient synovitis
- Caird's criteria accounts for CRP; elevated CRP is an independent risk factor for septic arthritis of the hip and has been shown to be the strongest predictor amongst all criteria<sup>2,3</sup>.
- Our patient met only 1/4 original Kocher criteria, giving her a 3% chance of having septic arthritis. Using Caird's criteria, her chance of having septic arthritis of the hip was 74% given refusal to bear weight and elevated CRP<sup>2</sup>.
  - Notable is that if a patient is able to bear weight and has a normal CRP, their chance of having septic arthritis of the hip is <1%<sup>2</sup>.
- Kocher criteria is not validated for evaluation of the knee, though it has been shown that refusal to bear weight with an elevated CRP has a PPV of 89.7% for septic arthritis of the knee<sup>4</sup>.

## Take Aways

- When evaluating a patient for septic arthritis of the hip, the modified Kocher criteria should be used to determine the most accurate diagnostic probability.
- Septic arthritis must be kept on the differential even in patients who have rheumatologic or orthopedic disorders, and in patients who have a recent history of transient synovitis.

## References

1. Kocher MS, Zurakowski D, Kasser JR. Differentiating between septic arthritis and transient synovitis of the hip in children: an evidence-based clinical prediction algorithm. *J Bone Joint Surg Am.* 1999 Dec;81(12):1662-70.
2. Singhal R, Perry DC, Khan FN, et al. The use of CRP within a clinical prediction algorithm for the differentiation of septic arthritis and transient synovitis in children. *J Bone Joint Surg Br.* 2011;93-B(11):1556-1561. doi:10.1302/0301-620X.93B11.26857
3. Caird MS, Flynn JM, Leung YL, Millman JE, D'Italia JG, Dormans JP. Factors distinguishing septic arthritis from transient synovitis of the hip in children. A prospective study. *J Bone Joint Surg Am.* (2006) 88(6):1251-7. 10.2106/JBJS.E.0021
4. Bisht RU, Burns JD, Smith CL, Kang P, Shrader MW, Belthur MV. The modified Kocher criteria for septic hip: Does it apply to the knee? *J Child Orthop.* 2022 Jun;16(3):233-237. doi: 10.1177/18632521221106383. Epub 2022 Jun 30. PMID: 35800650; PMCID: PMC9254023.