The differential diagnosis of arthritis in children

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Arthralgia/arthritis

- **Arthralgia**: pain in a joint

- **arthritis**: joint swelling and/or articular pain and limitation of motion
Diseases that can cause articular involvement

- Infectious
- Post-infectious
- Inflammatory
- Hematological
- Neoplastic
- Genetic
- Orthopedic
The group of pieces

- Medical history and physical examination
  characteristics of articular involvement
  extra-articular symptoms
- Laboratory examination
- Imaging
- Follow-up
Arthritis characteristics

- Persistent or transient
- Number and type of joints
- Symmetric or asymmetric
- Intensity of articular pain
- Fixed or migrant
- Swelling > pain or vice versa
- Sensitivity to NSAIDs
- Morning stiffness
- Pain on loading
- Presence of enthesopathy
Diseases that can cause articular involvement

- Infectious
- Post-infectious
- Inflammatory
- Hematological
- Neoplastic
- Genetic
- Orthopedic
Septic arthritis
TB

Disciitis
Congenital syphilis
Diseases that can cause articular involvement

- Infectious
- **Post-infectious**
- Inflammatory
- Hematological
- Neoplastic
- Genetic
- Orthopedic
Viral arthritis

- Measles
- Rubella
- Varicella
- Parvovirus B19
- Epstein-Barr virus
- Herpesvirus
- Adenovirus
- Hepatitis B virus
- Coxsakie
- Mumps
Reactive arthritis

- Yersinia, Shigella, Salmonella, Chlamydia infections
- HLA-B27 +

- Oligoarthritis (*post-dissenteric arthritis*) or the (rare) triad of arthritis, conjunctivitis and urethritis (*Reiter syndrome*)
Lyme disease

Rheumatic fever
Diseases that can cause articular involvement

- Infectious
- Post-infectious
- Inflammatory
- Hematological
- Neoplastic
- Genetic
- Orthopedic
Dermatomyositis
Systemic scleroderma
Henoch-Schoenlein synd.  Kawasaki disease

Behcet syndrome
Takayasu arteritis
Polyarteritis nodosa
Wegener’s granulomatosis
Crohn’s disease

Sarcoidosis
Diseases that can cause articular involvement

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Diseases that can cause articular involvement

- Infectious
- Post-infectious
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- Neoplastic
- Genetic
- Orthopedic
Leukemia

Neuroblastoma

Lymphoma
Hemangioma

Osteoid osteoma
Diseases that can cause articular involvement

- Infectious
- Post-infectious
- Inflammatory
- Hematological
- Neoplastic
- Genetic
- Orthopedic
Camptodactyly-arthritis syndrome
Carpo-tarsal osteolysis
Mucopolysaccharidosis

Mucolipidosis
Farber’s disease

Gaucher’s disease
Progressive pseudorheumatoid chondrodysplasia
Autoinflammatory diseases

- Inherited diseases
- Onset often in pediatric age
- Recurrent bouts of seemingly unprovoked inflammation characterized by fever +/-:
  - serositis
  - synovitis
  - rash
- Recurrent or persistent inflammation with specific organ involvement
Cryopyrin associated periodic syndrome (CAPS): spectrum of disease

Familial cold autoinflammatory syndrome (FCAS)
- Autosomal dominant
- Cold-induced
  - Rash
  - Arthralgia
  - Conjunctivitis

Muckle–Wells syndrome (MWS)
- Autosomal dominant
- Urticarial rash
- Sensorineural deafness
- AA amyloidosis (in 25% of patients) leading to renal failure

NOMID/CINCA
- Sporadic
- Progressive chronic meningitis
- Deafness
- Visual and intellectual damage
- Destructive arthritis

NOMID/CINCA, neonatal-onset multisystem inflammatory disease/chronic infantile neurological cutaneous and articular syndrome
PAPA syndrome

- pyogenic arthritis
- acne
- pyoderma gangrenosum

PSTPIP1/CD2BP1 mutations (interacts with pyrin)

Autosomal dominant
Blau syndrome

granulomatous polyarthritis

panuveitis

exanthema

mutations of NOD2 (intracellular sensor of bacteria)

Autosomal dominant
9 patients

24 Patients (50% fulfilling the diagnostic criteria for PAN)
Most common clinical features

- Recurrent fevers
- Livedo reticularis
- Early-onset, recurrent hemorrhagic strokes
- High ESR and CRP
- Pathological findings consistent with PAN
- Impressive efficacy of anti-TNF treatment
Clinical features

- Mutation common among persons of Georgian Jewish ancestry where mild cases were often recognized in patients only after severe disease developed in a relative.

- Clinical manifestations range from early-onset multiple strokes to limited cutaneous lesions in advanced adult age.

- Mutations in the ADA2 gene may be more common than expected and may be associated with a larger spectrum of disorders. This suggests that in the coming years the field of vasculitis could be revolutionized by genetic studies.
Activated STING in a Vascular and Pulmonary Syndrome


In patients with SAVI, constitutively activated STING leads to increased transcription of the type 1 interferon gene, IFNB1, which encodes interferon-β.

Liu et al NEJM 2014
Association of a Mutation in
LACCI With a Monogenic Form of
Systemic Juvenile Idiopathic Arthritis

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Haya Al-Dusery,2 Ewa A. Naim,1 Banan Al-Younes,1 Jameela Shinwari,2
Futwan Al-Almohanna,2 Brian F. Meyer,1 and Sulaiman Al-Mayouf2

COPA mutations impair ER-Golgi transport and cause
hereditary autoimmune-mediated lung disease and arthritis

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Sharon D Dell12, Michael R Waterfield13, Feroz R Papa3, Donna M Muzny11, Noah Zaitlen9, Suzanne M Leaf16,
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N Tony Eissa3, Richard A Gibbs4,11, James R Lupski1,4,11,17, Jordan S Orange1,2,17 & Anthony K Shum1,2,17

Loss-of-function mutations in TNFAIP3 leading
to A20 haploinsufficiency cause an early-onset
autoinflammatory disease

Qing Zhou1,19, Hongying Wang1,19, Daniella M Schwartz2, Monique Stoffels1, Yong Hwan Park1, Yuan Zhang3,
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CRMO
Multifocal, osteomyelitis-like, aseptic, bone lesions
Diseases that can cause articular involvement

- Infectious
- Post-infectious
- Inflammatory
- Hematological
- Neoplastic
- Genetic
- Orthopedic
Epiphysiolysis

Bone aseptic necrosis

Plant thorn synovitis

Perthes disease
Joint hyperlaxity
Fibromyalgia

Reflex sympathetic dystrophy
Pachydermodactyly
THANK YOU