Letter to the editor

Hip Pain in Children

Dr. med. Ayla Yagdiran, PD Dr. med. Kourosh Zarghooni, PD Dr. med. Jörg Oliver Semler, Prof. Dr. med. Peer Eysel in Heft 5/2020

Tibial Torsion Defects

The authors summarized the information well (1). However, I think they omitted a very important aspect of possibly congenital incorrect posture including the examination: tibial torsion defects.

Most commonly in a tibial torsion defect is an external rotation of the foot and the malleoli relative to the knee and the neutral plane. Those affected often compensate the externally rotated feet („Charlie Chaplin"-like gait) by inward rotation of the entire leg, with subsequent internal rotation of the knee (differential diagnosis in knee pain) and retrotorsion of the hip joint, which may lead to hip pain.

I therefore recommend always checking for tibial torsion defects on examination, in addition to the comparison between right-side and left-side internal rotation in supine and in prone positions as mentioned on p 73 of the article.

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The author declares that no conflict of interest exists.

Juvenile Idiopathic Arthritis

The consensus based term for a rheumatic joint disorder in childhood is "juvenile idiopathic arthritis (JIA)", and not "juvenile rheumatic coxitis." [note: the author points out a mistake in the German-language version of the article]. It is classified according to ILAR criteria (1). Crucial to our understanding is the definition of JIA, for which the following criteria have to be met:

- Objective confirmation of arthritis/enthesitis
- <16th year of life
- Duration longer than 6 weeks
- Other causes have been ruled out.

Rheumatoid arthritis in adults has to be differentiated from JIA. Differentiating between peri/post-infectious arthritis, which is very common in children and is often harmless, and rare, reactive arthritis requiring treatment is crucial. Both types have an infectious cause in the widest sense. To say that an infectious cause is a compulsory reason for diagnostic arthrocentesis to be carried out seems misleading. Septic arthritis is an orthopedic emergency and should be referred for arthrocentesis and joint irrigation. Peri/post-infectious arthritis does not constitute an indication for diagnostic arthrocentesis (2). Reactive arthritis often develops within a few weeks after a bout of gastroenteritis has been overcome. It is one of the spondyloarthropathies and should be treated according to the therapeutic principles of JIA. The mentioned laboratory tests to rule out infectious pathogens, including Borrelia and viruses, should be based on a well founded clinical suspicion. Measuring HLA B27 ("human leukocyte antigen"), rheumatoid factors, antinuclear antibodies (ANA) do not enable a diagnosis but merely help in classifying JIA.

The article (3) did not include details on the effectiveness and safety of intra-articular therapy using triamcinolone-hexa-acetonide. It is also important that JIA is often easily treated and has a good prognosis. Furthermore, the article (3) did not make any mention of interdisciplinary care of children with joint pain, which might help avoid unnecessary diagnostic evaluation and therapy. Much of all this is detailed in the recently revised published German consensus-based (S2k) guideline for the treatment of JIA (4).

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Pathological Entities Were Mixed Together

The section on hip dysplasia and hip dislocation in the article by Yagdiran et al (1) contains problematic information that cannot be left uncommented. First of all, the two pathological entities intertwined in this section—congenital hip dysplasia and neurogenic hip dislocation—are of secondary importance in an article about hip pain in children because in children, these

conditions usually manifest without pain. This necessitates complex surveillance programs that in congenital hip dysplasia means compulsory sonography in infants, with subsequent milestone radiography; in neurogenic hip dislocation it means follow-up by applying risk stratification according to the German hip surveillance program "Hüftampel".

Furthermore, it is not beneficial to mix together these two pathological entities, since they are clearly diametrically different in terms of etiopathogenesis, age at manifestation, and therapy (2, 3).

What is particularly problematic is citing the 2013 review by Shorter et al (reference 29) as regards the question of the validity of hip screening in neonates, which used evidence from 2009 and is therefore out of date—which should have been discussed in the context of the present article. A more recent current concept review was presented by Biedermann and Eastwood (4), which contains all relevant information on the topic and does not leave readers in any doubt about the value of neonatal hip ultrasound. This investigation is laborious to carry out in routine clinical practice, but it saves the children interminable suffering and takes the burden off pediatric orthopedic operating theatres, which, ultimately, should be what we should all aim for.

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The Value of Hip Ultrasound Screening

I was surprised to read in *Deutsches Ärzteblatt*—which published the fact first that general hip ultrasound screening is obligatory in Germany until now by law—that "at present, the question whether introducing general ultrasound hip screening for neonates could bring an improvement (...) is still under debate" (1).

As early as 2008, Ihme et al. showed that ultrasound screening is superior to mere clinical screening. The incidence rate of surgical measures was lowered by our hip ultrasound screening from 1.26/1000 liveborn infants who were merely clinically screened to 0.26/1000 infants.

In addition to the cited Vienna based working group of Thallinger, Thaler et al. showed in 2011 that in Austria, after Graf general ultrasound screening had been introduced in the first and sixth to eights week of life, the need for surgical interventions in children aged 0–15 years was reduced by 75.9% compared with general clinical screening including the Barlow and Ortolani test (3). Furthermore, as a result of ultrasound-guided therapy, treatment costs fell from 410 000 € per year to 117 000 €/year, while screening costs rose by only 57 000 €/year.

Admittedly, the articles by Thaler et al. and Thallinger et al. had not been published at the time of the Cochrane analysis. But the available study by Ihme et al. was not considered either.

In conclusion, the cited Cochrane review at best allows conclusions about the outcome of hip ultrasound screening methods in general. The Cochrane review is based on publications in which the ultrasound examinations were done according to Elbourne, Graf, Harcke, Terjessen or in a modified Graf-Technique (4).

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The Importance of Hip Ultrasound

The prevalence of hip dysplasia and hip dislocation is 2 to 5%—a thousand times that of all other named (1) pediatric hip disorders, with the exception of transient synovitis (0.076%). Hip dysplasia is also by far the most common hip disorder in children. In Anglo-American speaking countries, only unstable hips and later sub-dislocations or dislocations are treated; their reported incidence is 0.089–0.115% (2). Preventing instability by treating the dysplasia is obviously not a medico-economic goal.

Biomechanically, the hip joint develops as a result of the functional interaction between the joint head and socket over time. Fundamentally crucial for this is the optimal dynamic surface pressure load. Too small a socket surface or dysplasias undoubtedly reduce the resilience and lifespan of the joint.

In German-speaking countries, the introduction/establishment of Graf infant hip ultrasound screening in 1984 revolutionized the earliest diagnostic evaluation

and treatment of abnormalities of hip development. If ultrasound, treatment, and follow-up are carried out correctly, then—except for very few individual cases of teratogenic or neuromuscular origin—late sequelae of abnormalities of hip development can now be ruled out completely, compare to the past. High quality investigation as a result of thorough training is key. I myself investigated 26 414 children by Graf hip ultrasound examination; none of the children I treated from the beginning ever required subsequent surgery (3).

Using the Gocht–Shenton–Ménard line on the pelvic radiograph to assess the situation will yield results only where the hip joint is decentered, not in stable dysplasia.

Whether even dysplastic hips should be diagnostically evaluated and treated is not unclear: on the contrary, after completion of the first year of life sonographic follow-up monitoring of treated hips should become mandatory, as well as sonographic sceening by means of a qualified technique in at-risk groups (neuromuscular/Perthes disease, slipped capital femoral epiphysis/competitive sport) until the end of the growth period (4).

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The authors is the main organizer of the Munich working group for orthopedic ultrasound.

In Reply:

Our review article (1) aimed to provide readers with a practical algorithm to be applied in routine clinical practice. Because of the many possible causes of hip pain in children, we focused on the most common symptoms and the most relevant differential diagnoses. Since our article was written for a wide readership, some aspects were intentionally not discussed in depth and to the extent as would have been the case for a review article in one pathological entity. This is the only way in which to meet the requirements of a CME article.

Dr. Bouklas draws attention to the rare but painful retrotorsion of the hip as a possible but very rare differential diagnosis.

Dr. Dückers explains that the term "juvenile rheumatic coxitis" has been replaced by "juvenile idiopathic arthritis" [note: this refers to a phrase only found in the German-language version of the article]. With regard to diagnostic arthrocentesis, we restricted the recommendation obviously to those cases where using less invasive diagnostic tools did not yield any differentiation between a septic and aseptic pathogenesis. Further details can be seen in the revised JIA S2k guideline, which was not available at the time of our publication (2).

Prof. Heimkes criticized our intertwining of two entities—congenital hip dysplasia and neurogenic hip dislocation. This is partly the result of strict word limits. On the other hand, we wanted only to explain fundamental differences and show the different etiopathogeneses. We are aware that in congenital hip dysplasia, pain will develop only during adolescence, which is why in *Table 1* we listed these under adolescence. It is always possible that an adolescent patient presents with hip pain, and only then is hip dysplasia diagnosed, although this was congenitally already present. Even though hip screening in the context of the U3 has been found in retrospective analyses to lead to a reduction in such cases, this differential diagnosis cannot and must not remain unmentioned.

Prof. Heimkes, Dr. Seidl, and Dr. Hien take clear position regarding the value of general hip ultrasound screening. We also carry out Graf hip screening and are aware of the clinical benefits of this investigation. Let me add that hip ultrasound is carried out generally in all infants only in Germany and Austria (the country of the inventor's origin) and parts of Switzerland, whereas in almost all other countries in the world, hip ultrasound is carried out only in cases of an abnormal clinical finding ("general" versus "targeted"). Although the retrospective studies mentioned by our correspondents suggest that general hip ultrasound screening should be introduced, prospective studies that confirm a positive effect are still lacking (3). Relevant attempts to introduce general hip screening in Europe have failed, even though a pertinent consensus exists (4). An additional obstacle lies in the fact that a recent international literature review (5), which analyzed different hip types according to Graf (N=4876) while considering all grades of dysplasia and types displacement, showed in almost all cases a natural benign course without any interventions. The authors showed a spontaneous good outcome even for hip displacement: "For Graf 3 hips more than 50% were reported to develop into normal hips without treatment. As for Graf 4 hips this percentage was reported below 50%." A Norwegian study in which hip ultrasounds screening was undertaken in addition to a clinical examination should also be understood on this background. The authors observed that the treatment rate doubled. But this did not lead to any reduction of the already lower number of subsequent symptomatic cases of hip dysplasia or those requiring treatment (6). Even though we—as experienced pediatric orthopedic surgeons and advocates of general hip ultrasound screening—do not agree with these comments, they are part of the state of knowledge internationally.

Our review article (1) aspired to explain the current state of international scientific knowledge to our

readers. These, as treating doctors, are obliged—especially in the setting of pediatric patients—to inform patients/parents accordingly about the state of science and evidence. It is therefore all the more important to be able to access a sound knowledge base without putting personal attitude above (international) evidence.

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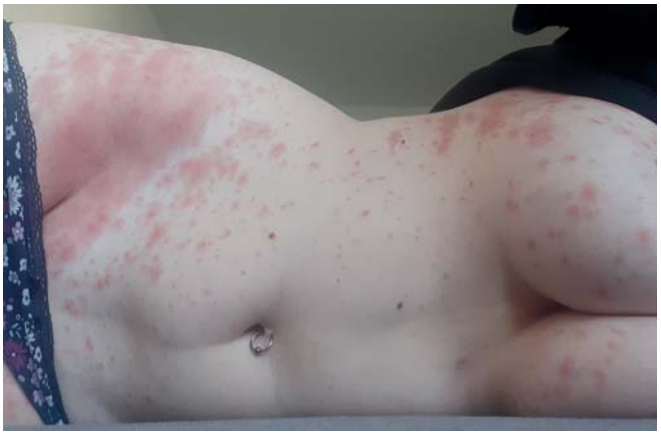
CLINICAL SNAPSHOT

COVID-19 Rash



A 31-year-old female patient presented at the Infection Emergency Clinic with fever, a positive SARS-CoV-2 swab test result and a skin rash. Scabies was diagnosed and treated on an outpatient basis. A short time later, she presented again at the Infection Emergency Clinic, this time with the teledermatological diagnosis of “erythema multiforme”, possibly toxic epidermal necrolysis (Lyell’s syndrome)“. In addition to the fever, which was still present, she had newly developed a loss of smell and taste. On clinical examination, she had a non-pruritic morbilliform to erythema multiforme, mostly on the trunk, without mucosal involvement. In the further course of the disease, her clinical symptoms, especially the skin changes, started to resolve with symptomatic treatment. After seven days, the patient was afebrile and asymptomatic. Up to 20% of COVID-19 patients develop a rash which is located primarily on the trunk. While a maculopapular rash is the most common manifestation, an urticarial, vesicular (varicelliform) or erythema multiforme may also occur, although less frequently. Later in the course of the disease, acral chilblain-like skin changes (pseudo-chilblains) with erythema, swelling and purple-colored discolorations may appear. The pathogenesis of these polymorphic skin changes is poorly understood. Thus, in febrile patients with a rash, especially if associated with loss of smell and taste, COVID-19-associated skin changes should be considered in the differential diagnosis and distinguished from maculopapular, urticarial drug eruptions and viral exanthems.

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