

Radiologist Integral to Work-Up of Limping Child

BY DOUG BRUNK
San Diego Bureau

LAS VEGAS — A radiologist experienced with imaging the pediatric hip and spine is key to evaluation of a limping child, Dr. Melvin O. Senac Jr. advised at a meeting sponsored by the American Academy of Pediatrics' California Chapters 1, 2, 3, and 4 and the AAP.

"The imaging modalities are changing so fast, whether it's the new 64 channel CT scanners or new sequences in MRI, it's hard to really keep up," said Dr. Senac, medical director and chief of radiology at Children's Hospital San Diego.

He discussed these causes of limping in children:

► **Diskitis.** This condition is marked by back pain, limping, inability to bear weight, and low-grade fever. It can affect infants less than 1 year old as well as teenagers.

In toddlers, nerve root irritation often causes hip pain that is worse than back pain, said Dr. Senac, who is also a professor of

radiology at the University of California, San Diego. The white blood cell count is usually normal but the erythrocyte sedimentation rate is usually elevated.

Bacterial infection, usually *Staphylococcus aureus*, is the most common etiology of diskitis. The primary nidus is the vertebral end plate. Long-term sequelae include normal to severe kyphosis.

"One of the hallmarks of plain film findings in diskitis is narrowing of the disk space with end-plate irregularity" at L 3-4 or L 4-5. It takes 2 weeks for these findings to show on plain film. MRI shows diskitis sooner.

► **Developmental dysplasia of the hip (DDH).** The four radiographic hallmarks of this condition include a small or nonossified femoral head on the affected side, increased acetabular angle, a laterally displaced femoral head, and interruption of Shenton's line.

"The earlier you pick it up, the better that child is going to do," Dr. Senac said. If the DDH diagnosis is made at under 6 months of age, treatment involves use of

a Pavlik restraint harness to position the hip in flexion and abduction. These children "do well and they'll go on to have a normal hip," he said.

If the diagnosis is made between ages 6 and 24 months, "those kids generally have to be hospitalized, put in traction, then taken to OR," he said. "Then, under general anesthesia, there's an attempt at reduction. Then they're put in a cast for 6-9 months." Delayed diagnosis and treatment result in gait problems, Dr. Senac said.

"If you pick it up in the first 6 weeks, the average stay in a harness is about 3.5 months," he said. "If you don't make the call until 6 weeks to 3 months of age, the average stay in the harness is about 7 months. It goes up to 9 months if you diagnose it between 3 and 6 months."

To confirm DDH, he recommends ultrasound in children younger than 4 months of age and radiographs in children aged 4 months and older. He pointed out that there is a steep learning curve to performing hip ultra-

sound on young infants, "so if you don't have a pediatric radiologist who does this, I suggest that the family drive somewhere to a facility that's doing a lot of these."

► **Transient synovitis.** This is the most common nontraumatic cause of acute limp in children aged 5-10 years. The etiology is thought to be a nonspecific anti-inflammatory response of synovium to an antecedent viral or bacterial infection.

Clinical exam may reveal limp, or hip or knee pain. Affected children have low-grade fever in about 25% of cases and a mildly elevated erythrocyte sedimentation rate in 50% of cases.

"It is a diagnosis of exclusion," Dr. Senac said. "If we do sophisticated MRI or [ultrasound], we'll find a little fluid in the joint. That's all we see."

Radiographs are usually normal but may show a small hip effusion. Scintigraphy is more sensitive but nonspecific.

Children can expect complete recovery within a few weeks.

► **Septic arthritis.** He called this condition "the scariest thing that

we have to face in this age group [aged 1-4 years] in regard to the limping child." Affected kids experience severe pain in the involved joint, most often the hip. They usually have a fever and an elevated white blood count. On radiographs, "we're looking for widening of the joint space to see if there's evidence of a hip effusion," Dr. Senac said.

The condition is hematogenous, "so you commonly have underlying osteomyelitis coupled with the septic joint."

If conventional radiographs are nondiagnostic and the physical exam is equivocal, then an MRI or a radionuclide bone scan should be obtained on an urgent basis. "Time is of the essence, as the proteolytic enzymes from the hip infection can rapidly destroy cartilage and subsequently the hip joint," he noted.

Treatment consists of draining the hip surgically and placing the child on intravenous antibiotics. If there is adjacent osteomyelitis, then this bone needs to be drained, generally by drilling. ■

Spondylitis, Tumor May Underlie a Tender Point of Back Pain

BY DOUG BRUNK
San Diego Bureau

LAS VEGAS — Not long ago, physicians were taught to believe that chronic back pain does not occur in children.

"But that just isn't true," Dr. David L. Skaggs said at meeting sponsored by the American Academy of Pediatrics' California Chapters 1, 2, 3, and 4 and the AAP.

"We did a study of kids between the ages of 11 and 14, and found that 37% of them had back pain at any given time," said Dr. Skaggs, associate director of the Children's Orthopedic Center at Children's Hospital Los Angeles.

"So when a child comes in with back pain, it can be difficult to decide what's pathologic and what's not pathologic."

If a child presents with diffuse back pain that is triggered by physical activity, that comes and goes over time with periods of no pain, and that does not get worse at night, this is probably nothing to worry about.

Worry when a child presents with point tenderness back pain, or what he calls the "positive finger test" on physical exam. The culprit could be spondylolysis, diskitis, or a tumor.

"If the child points at one place and says, 'It hurts there,' that's when you should be concerned," he said. "Ask,

'Does it ever hurt at night, worse enough to wake you up? Is the pain getting worse?' If they say yes, you should order a MRI of the cervicothoracic lumbar spine."

Dr. Skaggs also discussed the following spinal problems that can occur in children:

► **Congenital muscular torticollis.** In this condition, the child's head tilts laterally with the ear toward one shoulder while the chin is rotated toward the opposite

An infant with suspected torticollis needs screening ultrasound to rule out hip dysplasia.

DR. SKAGGS

shoulder. The cause is thought to be fibrosis or compartment syndrome of the sternocleidomastoid muscle. "Often-times, when the kids are born they may not have this position, but within a few weeks, it develops," Dr. Skaggs said. "That's because it takes a while for the sternocleidomastoid muscle to fibrose or develop compartment syndrome after the trauma of birth."

If picked up early and physical therapy is begun in a timely fashion, the condition remits more than 95% of the time within the first year of life. However, most case series report about a 5% association with developmental dysplasia of the hip, "so I recommend getting a screening ultrasound in an infant who has congenital muscular torticollis. There are not enough studies to make recommendations, but I think it makes common sense," he said.

► **Plagiocephaly.** This usually is secondary to congenital muscular torticollis. The best treatment for this is to treat the torticollis. "Encourage the child to sleep with the head tilted in the opposite position of normal, and eventually the plagiocephaly will resolve spontaneously," he said.

If the plagiocephaly doesn't resolve in 6-8 months, referral to a neurosurgeon or an expert in bracing is warranted. "I'm generally not the biggest fan of bracing for most things in orthopedics, but [using a brace for] this really seems to work," said Dr. Skaggs, who is also a professor of orthopedics at the University of Southern California, Los Angeles.

► **Late-onset torticollis.** In this condition, which is most commonly due to C1-C2 rotatory subluxation, the sterno-

cleidomastoid muscle is tight on the opposite side to where the ear is toward the chin. It's in spasm from being stretched to accommodate the head position.

"Most of the time, it resolves spontaneously in a few days," he said. "If it does not resolve in a week, that means an instant referral to a specialist in pediatric spine disorders."

A CT scan of C1-C2 with the head turned to the right and left makes the diagnosis in most cases. If detected within 1 week, treatment involves placement of a soft cervical collar.

If detected within 1 month, treatment involves traction for reduction followed by placement of a cervical collar. Detection after 1 month of onset usually requires surgical fusion. ■

Brief Neurologic Exam for Back Pain

Dr. Skaggs offered the following way to quickly assess children for back pain:

► Have the child jump up and down on one foot, then the other.

► Have the child walk on his or her heels with the toes pointed upward. That covers L4 for ankle dorsiflexion. "With these first two tests, you've just covered about all of the strength and balance of the lower extremities," he said.

► Test the reflexes, including the umbilicus. If you lightly stroke the umbilicus on either side, the belly button should move to one side or

the other. If it doesn't move, that's normal. "But if it's asymmetrical, there's a great chance there's syrinx."

► Test for ankle clonus. Push up on the ball of the foot, forcibly dorsiflexing the ankle. One or two beats of clonus are normal, he said.

"Three or four beats and I'd consider a neurological work-up and/or an MRI."

► Assess hamstring tightness. A popliteal angle up to 30-40 degrees is normal.

► Check the feet. "Claw toes or a cavus foot is a sign that something neurological is going on in the spine."

