

NEWS FROM THE UNIVERSITIES

FEMORAL CONDYLAR OSSIFICATION VARIANTS: MR IMAGING FEATURES, PREVALENCE AND DIFFERENTIATION FROM NORMAL VARIANTS*

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MRI is an excellent modality for the imaging of disorders of the pediatric musculoskeletal system. The knee is the joint which is most commonly imaged by MRI in children. A wide spectrum of conditions may result in osteochondral lesions of the knee in children, including trauma, inflammatory disorders, hematological conditions, osteonecrosis, infection and tumors. These diseases all require early diagnosis and tailor-made therapy to prevent life-long disability in affected children. The differential diagnosis is wide and may be challenging, especially since variants of the ossifying process of the knee may mimic osteochondral lesions and should not be mistaken for pathological processes.

We sought to review the MR imaging features of conditions that may result in lesions of the bone and/or cartilage of the knee in children, illustrated in a study of juxta-articular venous malformation. There is a paucity of literature regarding the association of juxta-articular VM and arthropathy in children. We found that location and size of the VM did not correlate with arthropathy, but the degree of lesion extension into the joint space did.

We reported on the MRI features and the prevalence of ossification variants of the femoral condyles in children. It is well-known that age-related changes and normal variants in the normal maturation process of the distal femoral epiphyseal cartilage may occur. In 22.2% of patients ossification variants were present, early ossification center (18.9%) and

Table I. — MR imaging features that help differentiate femoral condylar ossification variants from OCD.

MR Imaging Feature	Ossification Variant	Stable OCD
Side	Medial = Lateral	Medial > Lateral
Age range	3-13 years (Male) 2-10 years (Female)	8-16 years
Peak age	7-10 years	11-14 years
Residual physeal cartilage	100% - > 20%	< 30% - < 10%
Bone marrow edema	0	93%
Joint effusion	0	8%
'Lesion angle'	< 105°	> 105°
Location (sagittal plane)	Posterior (100%)	Middle (88%) +/- Posterior
Intercondylar location	0	26%
Spiculation (coronal plane)	26%	0

spiculated secondary ossification center (16.6%) were most commonly seen. As the prevalence of normal ossification variants is higher with greater residual physeal cartilage, these variants were most commonly encountered in young children.

We found that MRI can differentiate ossification variants from OCD of the femoral condyles in children. We refined the established criteria and added new criteria that may differentiate normal ossification variants from OCD on MRI, presented in Table I.

In conclusion, MRI can help differentiate normal ossification variants from pathologic conditions resulting in osteochondral lesions in the pedi-

atric knee. Accurate diagnosis of normal variants may prevent unnecessary treatment or even surgery; early diagnosis of osteochondral lesions may prevent life-long disability.

References

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