Current Research in MRI

Case Report

Case Report and Review of Literature of Van-Neck Odelberg Disease: A Challenging Differential Diagnosis for Pelvic Fractures

Nur Hürsoy, Lütfullah Sağır, Elif Arzu Özen, Fatma Beyazal Çeliker

Department of Radiology, Recep Tayyip Erdoğan University, Faculty of Medicine, Rize, Turkey

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Corresponding author: Nur Hürsoy, e-mail: nur.hursoy@erdogan.edu.tr

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Abstract

Ischiopubic synchondrosis is a temporary joint, and this joint's swelling can be presented with pelvic pain in adolescents. Even though there is some hypothesis about this condition, histopathology is unclear. Because of the broad differential diagnosis list of pelvic pain, the awareness of this entity is essential to provide the unnecessary procedures. We have presented 2 cases of that condition with imaging findings.

Keywords: Ischiopubic synchondrosis, osteochondritis, Van Neck–Odelberg disease

INTRODUCTION

Pelvic pain is a common and essential problem in children, especially after trauma. Magnetic resonance imaging (MRI) is a preferred imaging modality because of the lack of radiation, but the findings often can be unspecific. For example, fractures, benign and malign tumors, and osteomyelitis may be seen as bone marrow edema. Most differential diagnoses require additional processes such as computed tomography or biopsy.

Synchondroses are temporary joints that obliterate before puberty by the bony union of synostosis. Ischiopubic synchondrosis (IPS) can be seen before the fusion of ischial and pubic bones as a radiolucent swelling on radiographs and is considered a normal variant. IPS is typically characterized by the detection of bone marrow edema and ting soft tissue edema on MRI. Consequently, unilateral findings of such nature may be misconstrued as pathological disorders

Sometimes, synchondrosis closure may be painful, and this entity was described with imaging findings by Odelberg and van Neck in the 1920s.[2] We have presented 2 cases of van Neck–Odelberg disease.

CASE PRESENTATIONS

Case 1

An 8-year-old girl was evaluated because of right hip pain for 3 days. There was no trauma history, and laboratory findings were normal. The MRI was obtained for suspected Perthes disease. Expansion of IPS with perilesional edema was seen on MR sequences (Figure 1). There was no abnormality on the femoral head, and the hip joint was also normal.

Case 2

A 4-year-old boy was diagnosed with osteomyelitis in the right limb (Figure 2). He had an abscess and edema surrounding his tibia at present. Because he complained of left groin pain after 8 months of treatment, a left hip MRI was acquired. There was asymmetrical soft tissue edema surrounding IPS (Figure 3).

DISCUSSION

Differential diagnosis of bone marrow edema includes osteomyelitis, stress reactions—fractures, and malign infiltrations. Especially if the pain is present, clinical and radiological findings could be a significant challenge. However, evaluating these findings with the right aspects made management more effortless.

Ischiopubic synchondrosis is a temporary joint that can be seen before skeletal maturation. There are 2 ossification centers and a cartilaginous center, and at the pre-pubertal period, bilateral enlargement of the synchondrosis is normal.[3]

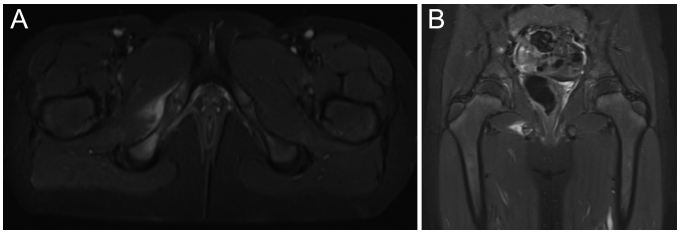

Figure 1. (A, B) Axil and coronal T2-weighted magnetic resonance images. Signal intensities are compatible with soft tissue edema at the surrounding muscles of the right ischiopubic synchondrosis. Enlargement and minimal irregularity of right ischiopubic synchondrosis are detected when comparing left side.

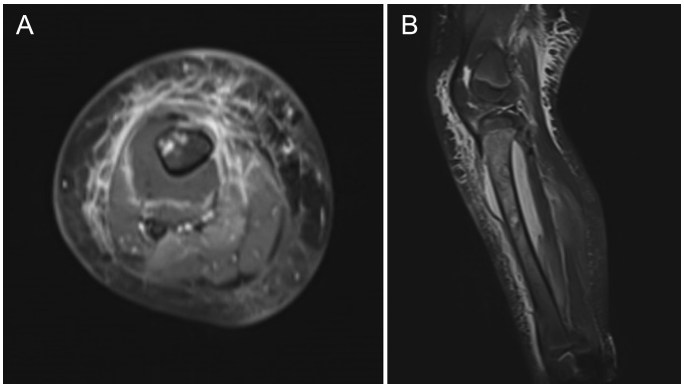

Figure 2. (A, B) Gadolinium contrast-enhanced fat-suppressed axial T1-weighted and coronal T2a-weighted crural magnetic resonance images. Subperiosteal abscess with peripheral contrast enhancement and bone marrow edema at the proximal half of the tibia indicate osteomyelitis.

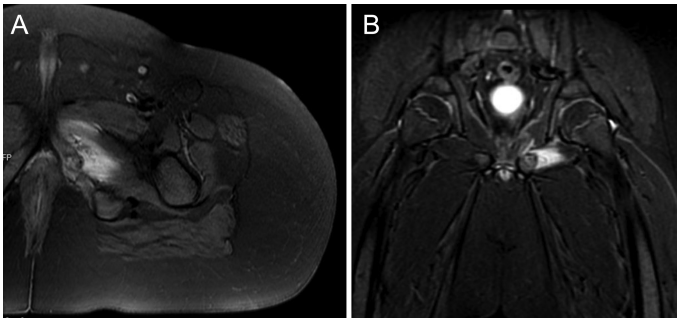

Figure 3. (A, B) Axial and coronal T2-weighted magnetic resonance images of the contralateral side of osteomyelitis. Soft tissue edema at the adjacent muscles to left ischiopubic synchondrosis. Imaging findings are similar to Figure 1A, B.

Swelling at the ischiopubic fusion zone on plain radiographs was accepted as a normal variant before puberty. Nevertheless, an asymmetrical appearance could be seen, probably because of unbalanced mechanical stress—the pain at this joint with or without limitation in a movement named van Neck–Odelberg disease. Although even the main etiopathogenesis of this disease is not certain, it is characterized by osteochondritis of the ischiopubic ramus, and with symptomatic treatment, patients recover in a few weeks.[4,5] There are different views about the relationship between IPS and the dominant leg in literature. In some case reports, patients complain about the contralateral side of imaging findings.[6-8] In particular, for case 2, the leading cause may be the weight load on the left side due to the inability to use the right limb.

The literature reports cases of IPS in patients ranging from 3.5 to 15 years of age.[2,4-7,9-16] The youngest recorded patient was a 3.5-year-old girl with a dislocated right hip and IPS on the left side.[1] Most cases reported in the literature were between 6 and 8 years old. In the study of Herneth et al.[8] the estimated median age was 7.5 years. Out of the 15 reported cases, 11 were male, but there was no male predominance in one study about IPS.[17]

The primary complaint of patients with IPS is pain in the gluteal or groin area on the affected side. There are no specific examination findings, but it is interesting to note that 3 patients were found to be obese.[3,6,11] Being overweight may be considered a risk factor for IPS.

The critical point is the exclusion of other clinical entities which may cause pelvic pain, like inflammatory arthritis, pathological fractures, osteomyelitis, and sarcoma.[10] Every possibility should be kept in mind for early diagnosis, but, on the other hand, overdiagnosis should be avoided. Investigation revealed that elevated inflammatory markers and positive blood cultures could help the diagnosis of osteomyelitis and juvenile inflammatory arthritis. Excessive exercise habits should be interrogated in the patient's history, and serum calcium and vitamin D levels should be examined to determine the risk of pathologic fractures. The absence of lytic lesions on radiographs helps exclude Ewing sarcoma, but if there is a doubt about the diagnosis, follow-up imaging must recommend.

The MRI helps rule out other differential diagnoses and reduces ionizing radiation imaging in patients with van Neck–Odelberg disease.[17,18] The awareness of physiologic or benign conditions of the musculoskeletal system in childhood is essential to avoid unnecessary interventions and additional imaging.

MAIN POINTS

- Van Neck–Odelberg disease may be present with hip pain in children.
- Magnetic resonance imaging and laboratory findings can help exclude other possibilities.
- Overuse of one side of the legs may cause this entity.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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Declaration of Interests: The authors declare that they have no competing interest.

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REFERENCES

1. Herneth AM, Trattnig S, Bader TR, et al. MR imaging of the ischiopubic synchondrosis. *Magn Reson Imaging*. 2000;18(5):519-524. [CrossRef]
2. MacArini L, Lallo T, Milillo P, Muscarella S, Vinci R, Stoppino LP. Case report: multimodality imaging of van Neck-Odelberg disease. *Indian J Radiol Imaging*. 2011;21(2):107-110. [CrossRef]

3. Aubry S, Chateil JF. Pediatric radiology. *J Radiol*. 2006;87(7-8):899-905. [CrossRef]
4. Ceri L, Sperati G. Van Neck-Odelberg disease in a 8-year-old children: a rare case report. *Acta Biomed*. 2020;91(4-S):238-240. [CrossRef]
5. Morante Bolado I, Ortega Navaridas M, Clemente Garulo D, López Robledillo JC. Van Neck-Odelberg disease: another cause of limp in childhood. *Reumatol Clin*. 2017;13(5):299-300. [CrossRef]
6. Beyitler İ, Kavukcu S. A case of van Neck-Odelberg disease and intermittent overuse injury. *Arch Rheumatol*. 2016;31(4):381-383. [CrossRef]
7. Camacho DAH, Bernal P, Cifuentes L, Rivero O. Van Neck–Odelberg disease: a rare cause of pain in pediatric pelvis. *World J Nucl Med*. 2020;19(4):435-437. [CrossRef]
8. Herneth AM, Philipp MO, Pretterklieber ML, Balassy C, Winkelbauer FW, Beaulieu CF. Asymmetric closure of ischiopubic synchondrosis in pediatric patients: correlation with foot dominance. *AJR Am J Roentgenol*. 2004;182(2):361-365. [CrossRef]
9. Narayanan SA, Chandy LJ, Kandathil JC. Van Neck disease: a rare case. *Case Rep Orthop Res*. 2021 January 25 Cited 2023 Mar 4;4(1):39-42. [CrossRef]
10. Sabir N, Çakmak P, Yılmaz N, Yüksel S. Osteochondrosis of ischiopubic synchondrosis: van Neck–Odelberg disease. *J Pediatr*. 2021;229(February):307-308. [CrossRef]
11. Oliveira F. Differential diagnosis in painful ischiopubic synchondrosis (IPS): a case report. *Iowa Orthop J*. 2010;30:195-200.
12. Sandomenico C, Tamburrini O. Bilateral accessory ossification center of the ischio-pubic synchondrosis in a female infant. Follow-up for over a three year period. *Pediatr Radiol*. 1981;10(4):233-236. [CrossRef]
13. Chaudhari AP, Shah G, Patil SS, Ghodke AB, Kelkar SB. Van Neck-Odelberg disease: a rare case report. *J Orthop Case Rep*. 2017 January-February;7(1):24-27. [CrossRef]
14. Fonseca JP, Figueiredo P, Pinheiro JP. Osteochondroses in children's sports practice – a rare case of van Neck–Odelberg disease. *JRM-CC*. 2022;5:jrmcc00090. [CrossRef]
15. Korkmazer S, Kaptan AY, Eren TK, Sepetçi Ö, Tekpınar İ, Tıraş HM. A rare disease of the pediatric pelvis: van Neck-Odelberg disease. *Jt Dis Relat. Surg Case Rep*. 2022;1(1):15-18.
16. Jose J, Smith MK, Silverman E, Lesniak BP, Kaplan LD. Stress injuries of the ischiopubic synchondrosis. *Am J Orthop (Belle Mead NJ)*. 2013;42(3):127-129.
17. Schneider KN, Lampe LP, Gosheger G, et al. Invasive diagnostic and therapeutic measures are unnecessary in patients with symptomatic van Neck–Odelberg disease (ischiopubic synchondrosis): a retrospective single-center study of 21 patients with median follow-up of 5 years. *Acta Orthop*. 2021;92(3):347-351. [CrossRef]
18. Costa E Silva A, Teixeira B, Pereira AC, Almeida E. Van Neck-Odelberg disease: A rare case report. *Port J Pediatr*. 2021;52(4):341-342.