

CASE REPORT

Ischio-pubic osteochondritis (Van Neck-Odelberg disease): A case report

Muhammad Iqbal*, Muhammad Naeem, Muhammad Babar Imran,
Muhammad Shahzad Afzal, Muhammad Saeed Akhtar

ABSTRACT

Background: Ischio-pubic Osteochondritis is characterized by an atypical ossification pattern of the ischio-pubic synchondrosis. Radiologically it may mimic stress fracture, neoplasm, osteomyelitis, or post-traumatic osteolysis. ^{99m}Tc -MDP bone scintigraphy with SPECT/CT is one of the effective tools for its diagnosis.

Case presentation: A male patient, 11 years of age visited nuclear medicine department of our hospital with complaint of pain in the right hip with no history of fever, trauma or fall. There were no signs of inflammation or swelling at the site of pain. X-ray showed lytic lesion in the right inferior ischio-pubic ramus with area of lucencies. A ^{99m}Tc -methylene diphosphonate (^{99m}Tc -MDP) bone scan showed focal area of increased uptake in the right inferior ischio-pubic ramus. SPECT/CT hybrid imaging showed areas of demineralization at the edges of ischio-pubic synchondrosis with areas of sclerosis, findings compatible with Ischio-pubic osteochondritis. Patient was later treated with anti-inflammatory drugs and steroids.

Conclusion: Ischio-pubic Osteochondritis is one of the differential diagnosis in children presenting with pain in the groin, hip or gluteal region and limping gait. Ample awareness of this ailment is necessary for early diagnosis and proper management, to alleviate the suffering of child.

Keywords: ^{99m}Tc -MDP bone scintigraphy, SPECT/CT, Ischio-pubic Osteochondritis, Van Neck-Odelberg disease, case report

Background

Ischio-pubic synchondrosis (IPS) is a sessile hyaline cartilage confluence between inferior ischial and pubic rami [1]. This transitory joint is seen in early infancy and annihilates with increase in age by either bony union or synostosis and is usually completely obliterated before puberty [2]. The enlargement of IPS is not an uncommon radiological finding, though in most of the cases it is considered as a normal growth phenomenon with no pathological impact. It is usually seen bilaterally in younger children due to bilateral symmetrical commencement of fusion in both hemipelvises while unilateral enlargement is seen in older children before closure [3]. Usually, ossification of synchondrosis is clinically asymptomatic, though in some cases, children

may complain of pain in the groin, hip or gluteal region. It may be associated with limitation of hip movement and limping gait referred as synchondrosis Ischio-pubic syndrome (SIS) [3,4]. Odelberg and van Neck described radiographic changes of SIS as bulge with demineralization of the ischio-pubic fusion region. They referred this unit as “osteochondritis ischio-pubica” also known as Van Neck-Odelberg disease [5,6]. Though these clinical features are highly non-specific and may be misleading especially in cases of equivocal radiographs. The differential diagnosis to be considered includes stress fracture, post traumatic osteolysis, osteomyelitis, and tumor [7,8].

Correspondence to:

Muhammad Iqbal

*Nuclear Medicine Physician, PINUM Cancer Hospital, P.O. Box 2019, Faisalabad, Pakistan

Email: Iqbalpinum@gmail.com

Full list of author information is available at the end of the article.

©EJMCR
<http://www.ejmcr.com>

^{99m}Tc-methylene diphosphonate (MDP) bone scan is widely used for evaluation of osteoblastic bone lesions [9]. We are reporting a case of Ischio-pubic osteochondritis as seen on ^{99m}Tc-MDP bone scan and hybrid imaging by Single photon emission computed tomography coupled with low dose computed tomography scan (SPECT/CT).

Case presentation

An 11 years old male patient visited nuclear medicine department of our hospital with a presenting complaint of pain in the right hip. There was no history of fever, trauma or fall. Clinically there were no clinical signs of inflammation or swelling. No signs of muscle spasm were noted. Both hip joints showed normal mobility in various plans. Recent X-ray showed lytic lesion in the right inferior ischio-pubic ramus with area of lucencies [Figure 1].

He was advised ^{99m}Tc-methylene diphosphonate (^{99m}Tc-MDP) bone scan, which was performed with Infinia dual head SPECT/CT gamma camera equipped with low energy high resolution collimators at 140KeV peak with 20% energy window. Bone scan showed focal area of increased uptake in the right inferior ischio-pubic ramus [Figure 2]. Complementary SPECT/CT was performed. Low dose 4 slices CT showed areas of demineralization at edges of ischio-pubic synchondrosis with areas of sclerosis, SPECT showing focal increased uptake in the inferior ischio-pubic ramus. Fused SPECT/CT images confirmed the focal uptake to be in the ischio-pubic synchondrosis [Figure 3]. Final diagnosis of Ischio-pubic Osteochondritis was made. Later patient was treated by orthopedic surgeon with anti-inflammatory drugs and steroids. Patient responded very well to treatment thus confirming our diagnosis.



Figure 1. X-ray showing lytic lesion in the right inferior ischio-pubic ramus with area of lucencies.

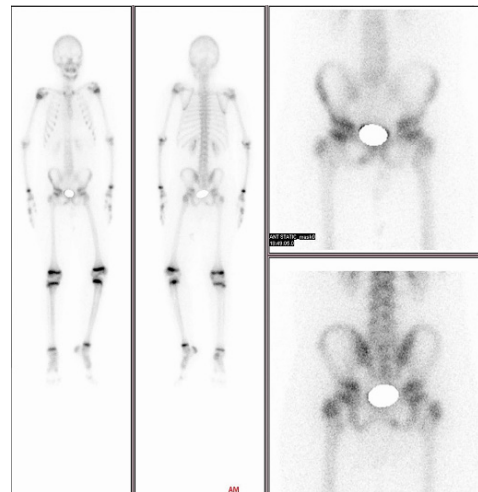


Figure 2. ^{99m}Tc-MDP bone scan showing focal area of increased uptake in the right inferior ischio-pubic ramus.

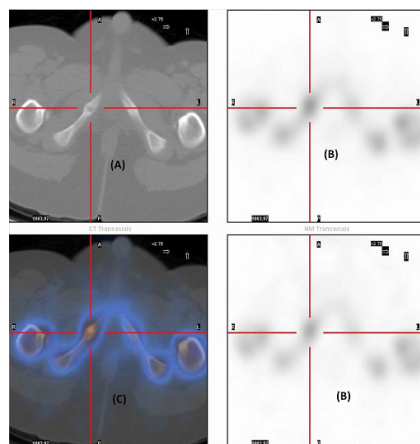


Figure 3. ^{99m}Tc-MDP bone scan with SPECT/CT images. (A) CT images showing areas of demineralization at edges of ischio-pubic synchondrosis and areas of sclerosis. (B) SPECT showing focal increased uptake in the inferior ischio-pubic ramus. (C) Fused SPECT/CT images confirms focal uptake to be in ischio-pubic synchondrosis.

Discussion

Ischio-pubic synchondrosis (IPS) is a transitory hyaline cartilage between inferior ischial and pubic rami [1]. This joint usually obliterates completely before puberty by bony union [2]. Its enlargement is not an uncommon radiological finding due to asymmetric closure of IPS, though it remains clinically asymptomatic. In some cases, children may present with pain in the groin, hip or gluteal region with restriction of hip movement and limping gait. This combination of clinical symptoms is usually referred as Synchondrosis Ischio-pubic syndrome (SIS) [3,4]. On plain X-rays, SIS is outlined as a bulge with areas of demineralization at IPS, referred by Odelberg and van Neck as “osteochondritis ischio-pubica” or “Van Neck-Odelberg disease” [5,6]. Multiple factors lead to enlargement of IPS, by inducing inflammatory response leading to delayed/deranged ossification. Most important of all, is uneven physical strain like kicking, dancing or jumping [4]. On conventional radiographs, its tumor like appearance can create panic. Therefore, it is very important to correctly and timely diagnose Ischio-pubic osteochondritis (IPO) as a benign disorder. Computed tomography (CT) scan usually show areas of sclerosis and lucencies. Diagnosis on magnetic resonance imaging (MRI) is usually on basis of abnormal marrow signals with fibrous bridging [4]. The differential diagnosis includes stress fracture, post traumatic osteolysis, osteomyelitis, and tumor [7,8]. Stress fractures of pubic rami in athletes can be challenging at times. Osteomyelitis is usually associated with a cascade of clinical symptom. Radiologically bony destruction with adjacent soft tissue collection is usually a hallmark of osteomyelitis. A ^{99m}Tc -MDP bone scan is widely used for evaluation of osteoblastic bone lesions [9]. Osteoblastic bone lesions can be identified about 18 months earlier on bone scan than X-rays [10]. Bone scan is least sensitive for lytic lesions. Multiple benign focal pathologies of bone can lead to false positive findings of skeletal metastasis/tumors e.g. fibrous dysplasia, enchondroma, osteoid osteoma, brown tumors due to hyper-parathyroidism, and degenerative bone disease [11]. Planer ^{99m}Tc -MDP bone scan with additional SPECT/CT hybrid imaging can enhance the sensitivity and specificity of procedure to pick small lesions and effectively characterize the target lesion [12,13]. In our case SPECT/CT helped to localize the target lesion to be in IPS, with additional characterization of the lesion with CT images. Correlating clinical picture with ^{99m}Tc -MDP bone scan and SPECT/CT images, a diagnosis of Ischio-pubic Osteochondritis (Van Neck-Odelberg disease) was made. Latter after treatment by orthopedic surgeon with anti-inflammatory, steroids and analgesic drugs coupled with complete bed rest improved symptoms dramatically, confirming diagnosis of Ischio-pubic Osteochondritis.

Conclusion

Ischio-pubic Osteochondritis (Van Neck-Odelberg disease) is one of the differential diagnosis (DDs) in

children presenting with pain in the groin, hip or gluteal region and limping gait. It is emphasized that ample awareness of this ailment is necessary for accurate and timely diagnosis in children. Early diagnosis and proper management can alleviate the suffering of child.

Acknowledgements

The authors would like to acknowledge the efforts and help of all the staff in the Department of Nuclear Medicine in preparation of this case report.

List of Abbreviations

CT	Computed Tomography
IPO	Ischio-Pubic Osteochondritis
IPS	Ischio-Pubic Synchondrosis
MDP	Methylene Di Phosphonate
MRI	Magnetic Resonance Imaging
SIS	Synchondrosis Ischio-pubic Syndrome
SPECT	Single Photon Emission Computed Tomography

Conflicts of Interest

No conflict of interest.

Funding

None

Consent from patient

Informed written consent was obtained from the patient to publish this case report.

Ethical approval

Approved by local ethical committee of institute.

Author details

Muhammad Naeem, Muhammad Babar Imran, Muhammad Shahzad Afzal, and Muhammad Saeed Akhtar
Department of Nuclear Medicine, PINUM Cancer Hospital, P.O. Box: 2019, Jail road, Faisalabad, Pakistan

Received Date: 28 March 2017

Accepted Date: 25 August 2017

Published Online: 31 August 2017

Author's Contribution

MI is the main author of the manuscript. MN helped in the write up. MN and MSA helped in literature review. MBI critically analyzed the manuscript and helped in writing discussion.

References

1. Luca Macarini, Tania Lallo, Paola Milillo, Silvana Muscarella, Roberta Vinci, and Luca P Stoppino. Case report: Multimodality imaging of Van Neck-Odelberg disease. *Indian J Radiol Imaging*. 2011; 21(2): 107-110.
2. Ceroni D, Mousny M, Anooshiravani-Dumont M, Buerge-Edwards A, Kaelin A. MRI abnormalities of the

- ischiopubic synchondrosis in children: A case report. *Acta Orthop Belg.* 2004; 70:283-6.
3. Herneth AM, Philipp MO, Pretterklieber ML, Balassy C, Winkelbauer FW, Beaulieu CF. Asymmetric closure of ischiopubic synchondrosis in pediatric patients: correlation with food dominance. *AJR.* 2004; 182:361–65.
 4. Herneth AM, Trattng S, Bader Tr, Ba-Ssalamah, Ponhold W, Wandl-Vergesslich K, Steinbach LS. MR imaging of the ischiopubic synchondrosis. *Magn Reson Imaging.* 2000; 18:519–24.
 5. Olderberg A. Some cases of destruction in the ischium of doubtful etiology. *Acta Chir Scand.* 1924; 56:273.
 6. Van Neck M. Osteochondrite du pubis. *Arch Franco-Belg Chir.* 1924; 27:238-41.
 7. Keats TE. Plain film radiography: sources of diagnostic errors. In: Resnick D, editor. *Diagnosis of bone and joint disorders.* 3rd ed. San Diego: Saunders; 1996. pp. 41–67.
 8. Fillipe Oliveira. Differential diagnosis in pain full IPS – a case report. *Iowa Orthop J.* 2010; 30:195-200.
 9. Mettler FA and Milton JG. *Skeletal system, Essentials of Nuclear Medicine Imaging.* 6th ed. Philadelphia, PA: Elsevier/Saunders 2012. p. 271-314.
 10. Choi J and Raghavan M. Diagnostic imaging and image-guided therapy of skeletal metastases. *Cancer Control.* 2012; 19(2):102-12.
 11. Gerard J O’Sullivan, Fiona L Carty, and Carmel G Cronin. Imaging of bone metastasis: An Update. *World J Radiol.* 2015; 7(8):202-211.
 12. Even-Sapir E, Flusser G, Lerman H, Lievshitz G, Metser U. SPECT/multislice low-dose CT: a clinically relevant constituent in the imaging algorithm of nononcologic patients referred for bone scintigraphy. *J Nucl Med* 2007; 48:319–24.
 13. Saha S, Burke C, Desai A, Vijayanathan S, Gnanasegaran G. SPECT-CT: applications in musculoskeletal radiology. *Br J Radiol* 2013; 86:20120519.

Summary of the case

Patient, age/gender	1	11 year/Male
Final Diagnosis	2	Ischio-pubic Osteochondritis (Van Neck-Odelberg disease)
Symptoms	3	Pain in the right hip
Medications (Generic names only)	4	NSAIDs, steroids
Clinical Procedure	5	X-ray Pelvis, ^{99m} Tc-MDP bone scintigraphy, SPECT/CT hybrid imaging.
Specialty	6	Nuclear Medicine
Objective	7	To diagnose cause of pain in the right hip.
Background	8	Ischio-pubic synchondrosis, Ischio-pubic osteochondritis, ^{99m} Tc-MDP bone scintigraphy, SPECT/CT.
Case Report	9	Ischio-pubic Osteochondritis (Van Neck-Odelberg disease) – A case report
Conclusion	10	Ischio-pubic Osteochondritis – Important to diagnosis it early for effective treatment.
MeSH Keywords	11	^{99m} Tc-MDP bone scintigraphy, SPECT/CT, Ischio-pubic Osteochondritis, Van Neck-Odelberg disease, Case report