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Osteitis Condensans Ilii: A Comprehensive Case Series of Five Patients with Radiological Insights and Differential Diagnosis

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Abstract: ***Background: Osteitis Condensans Ilii (OCI) is a rare, benign skeletal condition characterized by sclerosis of the iliac bones adjacent to the sacroiliac (SI) joints. It is often misdiagnosed as sacroiliitis or degenerative SI joint disease. OCI primarily affects women of reproductive age and is associated with chronic lower back pain. Objective: This case series aims to highlight the clinical presentation, imaging features, and management of OCI in five patients. We also explore the radiological challenges in differentiating OCI from other sacroiliac joint pathologies. Methods: A retrospective review of five female patients diagnosed with OCI was conducted. Clinical histories, radiological findings (X - ray, CT, MRI), differential diagnoses, and management strategies were reviewed. Results: The patients presented with chronic lower back pain. Radiological findings revealed bilateral symmetrical sclerosis of the iliac bones, sparing the sacrum and SI joint spaces. All patients underwent conservative management with physiotherapy and NSAIDs, resulting in symptomatic relief. Conclusion: OCI is a self - limiting, benign condition that requires accurate radiological differentiation from other inflammatory and degenerative sacroiliac joint diseases. Early recognition through imaging is key to avoiding unnecessary treatments and improving patient outcomes.***

Keywords: Osteitis Condensans Ilii, Sacroiliac Joint Disorders, Chronic Lower Back Pain, Multiparity and Pelvic Stress, Postpartum Sacroiliac Pain

1. Introduction

Osteitis Condensans Ilii (OCI) is an underrecognized but important cause of chronic lower back pain, particularly in women of childbearing age. OCI typically presents with bilateral sclerosis of the iliac bones adjacent to the sacroiliac joints. The condition is often asymptomatic but may cause pain and stiffness in some patients, leading to diagnostic confusion with other sacroiliac joint disorders such as sacroiliitis or degenerative SI joint disease. (1)

The pathophysiology of OCI is thought to be related to mechanical stress and vascular remodelling, particularly during pregnancy, where hormonal and biomechanical changes affect the pelvic bones. Radiologically, OCI is distinguished by symmetrical sclerosis of the iliac bones without sacroiliac joint involvement, which helps differentiate it from other sacroiliac joint pathologies. (2)
This case series presents detailed clinical histories, imaging findings, and management strategies for five patients diagnosed with OCI. We discuss the role of various imaging modalities, including X - ray, CT, and MRI, and the differential diagnoses essential for accurate identification of this rare condition.

2. Materials and Methods

This case series was conducted at the Department of Radiology, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry, over a two - year period. We reviewed the clinical and radiological data of five female patients diagnosed with OCI.

The inclusion criteria were as follows:

- Female patients aged 30 - 60 years presenting with chronic lower back pain.
- Imaging findings consistent with OCI (bilateral iliac sclerosis with sparing of the sacrum and joint spaces).

The exclusion criteria were as follows:

- Evidence of inflammatory sacroiliitis (e. g., ankylosing spondylitis).
- SI joint osteoarthritis or systemic inflammatory conditions (e. g., rheumatoid arthritis, psoriasis).

All patients underwent plain radiography as the first - line imaging modality, followed by CT and MRI when necessary. Management was conservative, with physiotherapy, NSAIDs, and ergonomic modifications. Follow - up was conducted to assess symptom resolution.

3. Discussion

Osteitis Condensans Ilii (OCI) is a rare, benign condition primarily affecting women of childbearing age, characterized by bilateral sclerosis of the iliac bones adjacent to the sacroiliac (SI) joints, with preserved joint spaces and no involvement of the sacrum. The clinical presentation is often marked by chronic lower back pain, typically without systemic symptoms, and it is commonly misdiagnosed as sacroiliitis or degenerative sacroiliac joint disease due to overlapping clinical and radiological features. The diagnosis of OCI is heavily reliant on radiological findings, which differentiate it from other sacroiliac joint disorders. This case series demonstrates the clinical variability and radiological

characteristics of OCI and emphasizes the importance of imaging in establishing an accurate diagnosis.

Pathophysiology of OCI

The exact pathophysiology of OCI remains unclear, but it is believed to be related to mechanical stress on the iliac bones, particularly during periods of increased pelvic load, such as pregnancy and postpartum periods. In these states, the mechanical and hormonal changes that occur in the pelvis can lead to vascular remodeling of the iliac bones, causing sclerosis. Additionally, repetitive stress due to prolonged standing, lifting, or other physical activities may exacerbate this process, as seen in some of the patients in this case series, such as Case 4, a schoolteacher with a history of prolonged standing.

Increased vascularity in the iliac region leads to bone remodeling and sclerosis, which is often self - limiting. The sclerosis is typically confined to the iliac bones, with no involvement of the sacrum or joint spaces, which are preserved in OCI. The condition is most frequently seen in multiparous women, further emphasizing the potential role of pregnancy in the condition's development. While typically asymptomatic, OCI can cause significant discomfort, leading to chronic pain and stiffness, as evidenced by the patients in this case series. (2)

Case 1: Postmenopausal Woman with Chronic Lower Back Pain

A 54 - year - old postmenopausal female presented with a 5 - month history of chronic lower back pain, aggravated by standing and physical activity. There was no history of trauma, systemic illness, or inflammatory features such as fever or weight loss. The patient had four full - term pregnancies, and although she had experienced mild back discomfort during her last pregnancy, this had resolved postpartum. The chronic pain, which persisted for several months, prompted an imaging study. Plain radiography revealed bilateral symmetrical sclerosis along the iliac margins of the sacroiliac joints, with no involvement of the sacrum and preserved joint spaces. The sclerosis was confined to the iliac bones, with no evidence of erosions or joint space narrowing, which helped differentiate OCI from sacroiliitis or osteoarthritis. A CT scan confirmed the sclerosis and ruled out any other bony abnormalities or inflammatory changes. These findings are consistent with OCI, and the diagnosis was made based on the characteristic bilateral sclerosis and the absence of any inflammatory features. OCI can affect postmenopausal women, although it is more commonly observed in younger women during or after pregnancy. In this case, conservative management with NSAIDs and physiotherapy led to significant relief of symptoms within 3 months.

Case 2: Postpartum Woman with Chronic Lower Back Pain

A 36 - year - old postpartum woman complained of persistent lower back pain that had started 8 months postpartum. The pain was localized to the lumbosacral region, worsened by physical activities such as lifting and bending, and had failed to respond to over - the - counter analgesics. The patient had a history of two full - term pregnancies, with no significant complications during delivery. Given the timeline and nature of her symptoms, the condition was suspected to be related to mechanical stress after childbirth. X - ray findings showed bilateral sclerosis of the iliac bones near the SI joints, with no involvement of the sacrum or joint spaces. MRI was performed to further evaluate the absence of bone marrow edema and synovitis, which would be indicative of sacroiliitis or other inflammatory conditions. The MRI revealed no evidence of marrow edema, joint effusion, or synovitis, which confirmed the diagnosis of OCI. The patient was treated with physiotherapy, focusing on core strengthening, and NSAIDs for pain relief. Significant improvement was noted over 6 months, demonstrating the benign and self - limiting nature of OCI. (3)

Case 3: Multiparous Woman with Chronic Back Pain

A 40 - year - old multiparous woman presented with chronic lower back pain for over a year, aggravated by prolonged standing and walking. The pain began following her third pregnancy, and although she had experienced some lower back discomfort during previous pregnancies, the pain this time was more persistent and disabling. The patient had no systemic symptoms, fever, or weight loss. X - ray demonstrated bilateral symmetrical sclerosis of the iliac bones near the SI joints, with preserved joint spaces and no sacroiliac joint involvement. CT imaging confirmed the sclerosis in the iliac bones and ruled out joint space narrowing or erosions, which would have suggested an inflammatory or degenerative process. These findings supported the diagnosis of OCI, which is often associated with multiparity and increased mechanical stress during and after pregnancy. Multiparity is a significant risk factor for OCI due to the repetitive mechanical stresses exerted on the iliac bones. (2) Conservative treatment, including physiotherapy and NSAIDs, provided significant symptom relief, and the patient reported improvement in her pain levels after 6 months of follow - up.

Case 4: Middle - Aged Woman with Intermittent Back Stiffness

A 45 - year - old schoolteacher presented with intermittent lower back stiffness and pain for the last 6 months, which was aggravated by prolonged standing during teaching hours. The patient had no history of trauma, inflammatory disease, or other systemic symptoms. She had a history of prolonged standing as part of her profession, which was suspected to be a contributing factor. X - ray revealed bilateral iliac sclerosis near the SI joints, with no signs of sacroiliac joint narrowing or erosions. CT confirmed the sclerosis, and MRI showed normal joint spaces and the absence of bone marrow edema or synovitis, ruling out sacroiliitis and degenerative changes. The imaging findings, along with the patient's occupational history, supported a diagnosis of OCI. Repetitive weight - bearing activities can contribute to bone sclerosis, especially in occupations that involve prolonged standing or lifting. Conservative treatment with NSAIDs and ergonomic adjustments led to significant symptom relief within 3 months, aligning with the self - limiting nature of OCI.

Case 5: Woman with Mild Chronic Pain After Physical Exertion

A 50 - year - old woman presented with mild chronic lower back pain for the last 4 months, which began after she engaged in increased physical exertion during house renovations. The pain was localized, non - radiating, and did

not have any neurological features. X - ray showed bilateral sclerosis of the iliac bones near the SI joints, with no involvement of the sacrum or joint spaces. MRI excluded any bone marrow edema or joint effusion, further supporting the diagnosis of OCI. Conservative management with physiotherapy and NSAIDs resulted in complete symptom resolution after 3 months.

Imaging Features

OCI's radiological hallmark is bilateral symmetrical sclerosis of the iliac bones near the SI joints with preserved joint spaces and no involvement of the sacrum. A key radiological feature that helps differentiate OCI from other sacroiliac abnormalities is the triangular shape of sclerosis along the iliac border, coupled with preserved joint space. This finding is typically first identified on plain radiographs, which remain the initial imaging modality. CT imaging confirms the extent of sclerosis and is crucial for excluding other conditions like sacroiliitis and degenerative joint disease. MRI plays an essential role in ruling out inflammatory conditions, as it demonstrates the absence of bone marrow edema, synovitis, and joint effusion, which would be present in ankylosing spondylitis or other inflammatory sacroiliac conditions. In our series, the MRI findings were instrumental in excluding inflammatory causes such as ankylosing spondylitis. CT was valuable in providing high - resolution images of the iliac sclerosis, while plain radiography confirmed the symmetric nature of the sclerosis and the lack of sacroiliac joint involvement. (3, 4)

Differential Diagnosis

OCI is characterized radiologically by bilateral symmetrical sclerosis of the iliac bones with preserved joint spaces, and no involvement of the sacrum. These features differentiate OCI from sacroiliitis, SI joint osteoarthritis, and other conditions that can present with chronic lower back pain. This distinguishes it from sacroiliitis, which typically shows joint space narrowing, subchondral erosions, and bone marrow edema on MRI, often associated with seronegative spondyloarthropathies, which are absent in OCI. Sacroiliac joint osteoarthritis is characterized by joint space narrowing, subchondral sclerosis, and osteophyte formation, features that are not seen in OCI. Paget's disease, while it may involve the pelvis, presents with bone expansion, coarse trabecular patterns, and cortical thickening, often affecting multiple bones and accompanied by elevated alkaline phosphatase levels presents with joint space narrowing, osteophytes, and subchondral sclerosis, which are not seen in OCI.

Diffuse idiopathic skeletal hyperostosis (DISH) involves ossification of spinal and pelvic ligaments, but the sacroiliac joint spaces remain intact, differentiating it from OCI. Insufficiency fractures, common in elderly osteoporotic patients, show disruption of bone continuity and marrow edema on MRI, findings not observed in OCI. Radiographs, CT, and MRI are complementary tools that help confirm the diagnosis of OCI by identifying its distinctive sclerotic patterns and ruling out inflammatory, degenerative, or traumatic sacroiliac joint pathologies. (5)

Treatment

It involves physical therapy and the use of non - steroidal anti - inflammatory drugs (NSAIDs) and muscle relaxants when necessary. While the symptoms of OCI are generally self - limiting, and radiological changes may resolve over time, it is important to correctly diagnose OCI, as in some cases, refractory symptoms can lead to disabilities and may necessitate surgical intervention. (6, 7)

4. Conclusion

Osteitis Condensans Ilii (OCI) is a benign, self - limiting condition that must be considered in the differential diagnosis of chronic lower back pain, particularly in women with a history of pregnancy, multiparity, or physical stress. This case series highlights the importance of accurate radiological evaluation in diagnosing OCI, as imaging plays a crucial role in distinguishing it from inflammatory conditions like sacroiliitis and degenerative joint diseases. The hallmark imaging features of bilateral iliac sclerosis and preserved joint spaces are critical for diagnosis. Most patients with OCI respond well to conservative management, including NSAIDs, physiotherapy, and ergonomic modifications, with symptom resolution observed in a few months. Early recognition and accurate diagnosis are essential to avoid unnecessary treatments, such as immunosuppressive therapies, and to ensure appropriate management, which leads to a favorable prognosis for most patients.

Additional Information

Disclosures

- **Human subjects:** All authors have confirmed that this study did not involve human participants or tissue.
- **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following:
- **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work.
- **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.
- **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

[1] Exploring the link between Post - partum backache and Osteitis Condensans Ilii – A case report and literature review. https: //doi. org/10.1016/j. inat.2020.100870
[2] Cidem M, Capkin E, Karkucak M, Karaca A. Osteitis condensans ilii in differential diagnosis of patients with chronic low back pain: a review of the literature. Mod Rheumatol.2012 Jun; 22 (3): 467 - 9
[3] Ma L, Gao Z, Zhong Y, Meng Q: Osteitis condensans ilii may demonstrate bone marrow edema on sacroiliac joint magnetic resonance imaging. Int J Rheum Dis.2018, 21: 299 - 307. 10.1111/1756 - 185X.13125
[4] Biswas S, Konala VM, Adapa S, Amudala P, Naramala S. Osteitis Condensans Ilii: An Uncommon Cause of Back Pain. Cureus.2019 Apr 22; 11 (4): e4518.
[5] Eshed I, Lidar M. MRI Findings of the Sacroiliac Joints in Patients with Low Back Pain: Alternative Diagnosis to Inflammatory Sacroiliitis. Isr Med AssocJ.2017 Nov; 19 (11): 666 - 669

[6] Vadivelu R, Green TP, Bhatt R. An uncommon cause of back pain in pregnancy. Postgrad Med J.2005 Jan; 81 (951): 65 - 7
[7] Ayoub MA: Refractory osteitis condensans ilii: outcome of a novel mini - invasive surgical approach. Int Orthop.2013, 37: 1251 - 1256. 10.1007/s00264 - 013 - 1901 - x