

# Osteitis Condensans Ilii

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**Abstract** Osteitis Condensans Ilii (OCI) is a benign cause of axial low back pain. Although no clear etiology has been identified, the prevailing theory is that mechanical strain affects the auricular portion of the ilium and causes premature arthritis. The location of the sclerosis has been traditionally confined to the ilium and may give the false impression of sacro-iliac joint involvement. Clinicians must be guided by history, radiographic findings, and laboratory studies in differentiating OCI with other disorders; furthermore additional causes of low back pain including metastatic disease and ankylosing spondylitis must be ruled out. Treatments for the condition are primarily conservative (therapies, non-steroidal anti-inflammatory medications, and steroid injections), with surgical resection being reserved for refractory cases.

**Keywords** Osteitis Condensans Ilii · Back pain · Review

## Introduction

Osteitis Condensans Ilii (OCI) is a benign etiology of axial low back pain which was first described based on radiographic findings in 1926 by Sicard et al. [1]. The condition was subsequently associated with sacroiliac joint sclerosis [2]. Despite the initial characterization, OCI primarily affects the auricular portion of the ilium. As this area is

located anteriorly to the sacrum and sacro-iliac joint, a false appearance of sacral involvement is created.

The prevalence of OCI in the general population has been estimated to be between 0.9 and 2.5% [3]. The condition is more common in young adults, with a predilection for females [4, 5]. Typically the disorder affects females before the fourth decade, often following pregnancy [6]. Despite numerous reports of OCI in pregnancy [4, 6–8], no clear association between pregnancy and OCI has been shown; males and nulliparous females have also been afflicted with the disorder.

## Diagnosis

It was initially theorized that OCI is a variant of ankylosing spondylitis, however, only a minority of patients with OCI have been found to be positive for HLA antigens [9].

OCI is characterized by predominant sclerosis of the auricular portion of the ilium (see Table 1). Despite a few case reports which have shown elevated ESR [5] OCI does not seem to be an inflammatory arthritis [4], and usually is not associated with an elevated ESR. Typically these patients are negative for HLA antigens [5] (Tables 2, 3; Fig. 1).

The disorder is easily confused with similar causes of axial low back pain such as seronegative spondyloarthritis [10], metastatic disease [11], or sacroiliitis [12]. Clinicians must be guided by history, radiographic findings, and laboratory studies in differentiating OCI with other disorders (see Table 4). Generally OCI is not associated with elevated markers of inflammation, has characteristic radiographic findings, and is not associated with bony destruction or erosion. Unlike OCI, AS is associated with bony erosions and joint space narrowing (greater than 2 mm) on

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**Table 1** Differential diagnosis of Osteitis Condensans Ilii

Osteitis Condensans Ilii
Sacroilitis
Lumbar strain
Ankylosing spondylitis
Piriformis strain
Ischio-gluteal bursitis
Seronegative spondyloarthropathy
Renal osteodystrophy
Lymphoma
Paget's disease
Primary hyperparathyroidism

**Table 2** Diagnostic criteria

Axial low back pain
Usually bilateral symptoms
Radiographic: Well defined triangular sclerosis—with ossification affecting the iliac portion of the articulation
Ossification is bilateral and symmetric
Sacroiliac joint space is spared
No evidence of erosive arthritis
Absence of sensory or motor loss
Normal bone scan
Lack of articular inflammatory findings
ESR variable
HLA negative

**Table 3** Treatments

Physical therapy
Non-steroidal anti-inflammatory medication
Fluoroscopically guided steroid injections
Surgical resection

radiographic images [13]. OCI is also generally not associated with the presence of HLA B27 antigens—which are found in AS.

Patients with OCI were initially characterized to have increased uptake in bone scans [14, 15]; however, this has not been confirmed in subsequent studies [5]. The use of bone scans may be used to exclude malignant conditions [11] or seronegative spondyloarthropathies if there is clinical suspicion for these conditions. This finding is in contrast to patients afflicted with ankylosing spondylitis, in which there does seem to be increased uptake in bone scans in the sacroiliac joint. In OCI, the joint space is generally spared, and there is no evidence of an erosive arthropathy [15]. Unlike metastatic disease, there is no evidence of bony destruction.

**Fig. 1** *Osteitis Condensans Ilii*: Bilateral sclerosis of the sacro-iliac Joint, predominantly affecting the iliac portion of the joint. Note characteristic well defined triangular sclerosis

### Pathophysiology

The pathophysiology of OCI is unknown. OCI was first associated with pregnancy in 1933 [2]. Subsequently, other researchers have postulated that the gravid uterus may compress the abdominal aorta and cause ischemia in the inferior portion of the ilium, however, this has never been substantiated [16, 17]. Other studies have suggested that mechanical stress of pregnancy itself may overload the sacro-iliac articulation and cause the disorder. Despite these theories, the etiology of the condition has not been identified; there have been no proven theories to explain the incidence of the disorder in males and nulliparous females [16]. The most common theory seems to be that mechanical strain of the sacro-iliac joint leads to premature joint degeneration and arthritis. [18].

Patients afflicted with OCI have formation of thick bone, predominantly in the iliac portion of the sacroiliac articulation [5, 19]. Histopathologic analysis of the ossification has demonstrated a quantitative increase in lamellar bone [20, 21].

In addition, ossification is commonly located in the medial-anterior portion of the joint [22]. The iliac ossification is typically bilateral and symmetric [4]. Although the ossification has traditionally been characterized to

**Table 4** Differential diagnosis of OCI

	OCI	SI	AS	Metastatic disease
Gender	Female	Female	Male	N/A
Axial low back pain	Present	Present	Present	Variable
Radiographic joint space narrowing	Absent	Present	Present	Variable
Triangular sclerosis affecting iliac bone	Present	Absent	Absent	Absent
Bone scan	Variable	Absent	Increased uptake	Increased uptake
HLA B27 antigen	Usually absent	Absent	Present	Absent
Systemic symptoms (weight loss)	Absent	Absent	Present	Present

predominantly affect the iliac bone, CT studies have demonstrated that the sacral aspect of the bone may also exhibit signs of sclerosis [23]. MRI examination has demonstrated sclerosis of the auricular appendage of the ilium, with normal sacro-iliac articulation and no evidence of erosions [6].

### Clinical signs and symptoms

Patients afflicted with OCI usually complain of intermittent axial low back pain [5], which may radiate into the buttocks and posterior thighs in a non-radicular fashion [6, 18]. Patients do not generally complain of systemic complaints (e.g., weight loss, malaise, and chills). Pregnant patients may complain of axial low back pain in the final trimester or immediately after delivery; the pain may be recurrent with subsequent pregnancies [18].

On physical examination the patients may have a positive FABER test (flexion, abduction, external rotation of the ipsilateral hip) [4] and focal tenderness over the sacroiliac joint. Patients may have increased lumbar lordosis, moderate obesity, and lumbar extensor muscle spasm [18]. Patients with OCI do not have any motor or sensory deficits. Active root tension signs (e.g., straight leg raise test) are negative, and there is no evidence of myelopathy. Interestingly, tests for sacro-iliac disease have also been found to be negative [18].

### Management

There are no published studies which have shown any particular treatment which has been effective in the management of OCI; however, the condition has largely been thought to resolve with conservative care. Management options for OCI range from benign neglect to surgical resection of the effected bone.

Initial management options include trials of physical therapy and non steroidal anti-inflammatory medications [4], however, it should be remembered that there is no good evidence which has demonstrated that the disorder has an

inflammatory component. Fluoroscopically guided steroid/anesthetic injections may also be employed. For cases refractory to conservative management, surgical resection of the osteitic bone has been reported to be beneficial [24]. Servodio et al. [24] report moderate success with surgical resection in two female patients that did not respond to conservative care.

### Conclusion

OCI is a benign cause of axial low back pain. Although no clear etiology has been identified, the prevailing theory is that mechanical strain affects the auricular portion of the ilium and causes premature arthritis. The location of the sclerosis has been traditionally confined to the ilium and may give the false impression of sacro-iliac joint involvement. Clinicians must rule out other causes of low back pain including metastatic disease and ankylosing spondylitis. Treatments for the condition are primarily conservative (physical therapy, non-steroidal anti-inflammatory medications, and steroid injections), with surgical resection being reserved for refractory cases.

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