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Radiology

RADIOLOGICAL SPECTRUM OF INFECTIOUS SACROILIITIS: A RETROSPECTIVE, STUDY OF 40 ADULTS.

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ABSTRACT

Purpose: The purpose of this study was to assess the demographic and clinical profile of patients presenting with infective sacroiliitis and to identify the MRI features that aid in the diagnosis of infective sacroiliitis.

Materials and Methods: This retrospective study included all ISI cases diagnosed between 2017 (september) and 2019(April) in radiodiagnosis department of Subharti Medical College. ISI was diagnosed if sacroiliitis was confirmed bacteriologically or, in the absence of pathogenic agents, if clinical, biological, and radiological data was compatible with this diagnosis and evolution was favourable under antibiotic therapy. MRI findings were correlated with clinical data, including age and duration of disease.

RESULTS: Overall, 40 cases of ISI were identified in adults, comprising 22 women and 18 men, with a mean age of 40.4 ± 18.1 years. Majority of the study population (67.5%) were between 21-40 years of age. All 40 patients complained of low back pain (100%) while 29 (72.5%) showed restricted spine movement. 29 out of 40 patients (72.5%) were febrile (mean temperature 37.8 ± 1°C) and hip pain was showed by 21 (52.5%) patients. CRP (n = 40) was elevated (mean, 9.62 mg/dL), Leukocytosis (n = 33) was only observed in 82.5% of patients (mean, 14,904 cells/μL).. Magnetic resonance imaging (MRI) of SI joint made the diagnosis to ISI in 40 cases. Unilateral ISI was diagnosed in 31 patients and bilateral ISI was diagnosed in 9 patients. Pathogenic agents were isolated in 25 cases. Mycobacterium Tuberculosis was the mostly isolated common bacteria. Others incluse streptococci, staphylococci and Pseudomonas aeruginosa. MRI features like bone marrow edema was noted in all the patients followed by periarticular muscle edema and capsulitis. Bony erosion were noted in long standing cases of ISI. Extracapsular fluid collection and joint space widening were the other important findings of ISI.

Conclusion: Our study confirmed that the clinical manifestations of ISI usually lead to delayed diagnosis. Based on our results, we suggest performing an MRI of the spine and SI in clinical situations characterised by lumbogluteal pain and symptoms of an infectious disease, such as fever helps in early diagnosis of ISI Firstly, bone marrow oedema with intra-articular fluid. Second, inflammation to involve the peri-articular soft tissues, particularly the iliacus and gluteal muscles. Third, peri-articular fluid collection or abscess is practically pathognomonic of an infective sacroiliitis

KEYWORDS :

INTRODUCTION:

The sacroiliac joints are home to several pathologies. Besides spondyloarthropathies representing the usual etiology bilateral sacroiliitis, an infectious etiology must be sought[1]. Infectious sacroiliitis are rare. Pyogenic infections and tuberculosis of the sacroiliac (SI) joint are uncommon, accounting for 1.5% to 10% of bone and joint infections (2). The diagnosis is difficult or frequently delayed because the presentation is insidious, with nonspecific and poorly localized signs of the infection that mimic abdominal or lumbar disc syndromes [3,4]. Physical examination and clinical tests, such as the Gaanselen's, Patrick's and Fabere tests, are often not executed or difficult to perform.(3)

METHODS:

The retrospective study included all patients with ISI hospitalised between 2017 and 2019 in the orthopaedics department and referred to the radiodiagnosis department of Subharti hospital university hospital in Meerut. ISI was diagnosed if there was bacteriological proof of infection or, in the absence of pathogenic agents, if the clinical, biological and radiological data was compatible with this diagnosis and evolution was favourable under antibiotic therapy. The following data was collected for each patient: (i) demographics (age at diagnosis, gender, and risk factors for ISI); (ii) imaging spectrum of ISI; Biological data (C-reactive protein [CRP], leukocytes (leucocytosis) and microbiological data were also recorded.

MR imaging was- performed at our institute, using a 1.5 T (Magnetom Symphony with Quantum gradients [maximum gradient amplitude, 30 mT/m; slew rate, 125 mT/m/sec]; with use of a spine phased-array coil. MR imaging of the sacroiliac joint was performed with coronal oblique T1, T2 and STIR, axial oblique T1, T2 and STIR and sagital T1 and STIR to identify and evaluate sacroiliitis.

RESULTS:

Overall, 40 patients were diagnosed with ISI between 2017 and 2019, comprising 18 men and 22 women (sex ratio M/F: 1/1.22) with a mean age of 40.4 ± 18.1 years. Majority of the study population (67.5%) were between 21-40 years of age.

All 40 patients complained of low back pain (100%) while 29 (72.5%) showed restricted spine movement. 29 out of 40 patients (72.5%) were febrile (mean temperature 37.8 ± 1°C) and hip pain was showed by 21 (52.5%) patients

The involvement of the sacroiliac joint (SI) was predominantly unilateral, with a left side predominance in 57.5% of cases (n = 23). Unilateral involvement of SI joint was noted in 31 (77.5%) while bilateral involvement was noticed in 9 (22.5%)

Only in 5 (12.8%) cases the diagnosis of ISI was suspected on admission. A variety of other diagnoses were suggested: sciatica (n = 14), spondylodiscitis (n = 4), common mechanical low back pain (n = 6), septic arthritis of the hip (n = 4) and inflammatory sacroiliitis (n = 3). In 4 cases, the initial diagnosis could not be identified precisely.

Regarding patient characteristics, 14 patients were already diagnosed of tubercular etiology and were on ATT. 5 patients were already getting treatment for other bacterial illness somewhere in the body, 2 patients had history of recent pregnancy, while 1 had history of trauma.

In all patients, CRP (n = 40) was elevated (mean, 9.62 mg/dL), Leukocytosis (n = 33) was only observed in 82.5% of patients (mean, 14,904 cells/μL).

Pathogenic agent was isolated in 25 cases by means of articular puncture (n = 6), blood culture (n = 14), cytobacteriological examination of urine alone (n = 2), or puncture of the psoas (n = 3). In other 15 cases for whom the causative organism could not be proven, the diagnosis of ISI was made on the basis of clinical course of disease and response to the ATT.

The most common causative agent was mycobacterium Tuberculosis (*n* = 15), followed by staphylococci (n = 5), streptococcus (n=3) and Pseudomonas aeruginosa (n=2).

MRI examination showed that 40(100%) patients had bone marrow edema. 28 (70%) cases showed even distribution of bone marrow edema involving the Sacro – iliac aspect, 9(22.5%) of them showed sacral aspect dominance and 3 (7.5%) of them showed iliac aspect dominance. Around 26 (65%) patients exhibited bone erosion. Caspulitis was seen in 34(85%) patients. Extracapsular fluid collection was noted in 23 (57.5%) of the patients, while peri articular muscle edema was appreciated in 37(92.5%) of them. Joint space was widened in patients 29 (72.5%).

Evolution was favourable in the majority of cases (n = 37), although one death occurred in a fragile patient, while another patient relapsed.

Table 1: Gender distribution of the study population

Gender	NUMBER OF PATIENTS(N=40)	%
Female	18	45
Male	22	55

Table 2: Age group of the study population

Age group (in years)	NUMBER OF PATIENTS	%
21-30	17	42.5
31-40	10	25
41-50	7	17.5
51-60	6	15

Table 3: Chief complaints among the study population

Variables	NUMBER OF PATIENTS	
	NUMBER	%
Low backache	40	100
Restricted spinal movement	29	72.5
Fever	29	72.5
Hip Pain	21	52.5

Table 4: Unilateral/Bilateral involvement of SI Joint on the Basis of MRI in the study population

SI JOINT INVOLVEMENT	NUMBER OF PATIENTS	%
Unilateral	31	77.5
Bilateral	9	22.5

Table 5: MRI findings of the study population

Variables	NUMBER OF PATIENTS	%
1) Bone Marrow Edema	40	100
• Sacro-iliac aspect	28	70
• Sacral aspect	9	22.5
• Iliac aspect	3	7.5
2) Capsulitis	34	85
3) Bone Erosion	26	65
4) Extracapsular Fluid Collection	23	57.5
5) Peri Articular Muscle Edema	37	92.5
6) Joint Space Widening	29	72.5

DISCUSSION :

The present study was undertaken to assess the ISI by the means of MRI on 40 patients who presented with low backache and were referred to the department of Radio-diagnosis at Subharti Medical College & Hospital. ISI diagnosis is difficult owing to its clinical heterogeneity and the lack of symptom specificity [2,5], with some authors referring to it as a "diagnostic challenge" [6,7]. Similarly, in our study the most frequent clinical sign recorded was backache [7-9,10-14). Although rarely performed, manipulation of the SI joint is often very painful [6,12,13,15].

The presence of fever is variable (72.5% of cases in our study vs. 35.3% in the literature). In an earlier review by Vyskocil, fever was found to be more common (75%) [16]. Thus, a diagnosis of ISI is rarely suspected on admission. As shown in our study, the clinical picture may be misinterpreted as sciatica or spondylodiscitis.(5)

Generally, the infection is unilateral, with a predominance for the left side (57.5% in our study and 60% in the literature, with the exception of a Taiwanese study reporting predominantly right-sided or bilateral infections [17]). During pregnancy, the infection appears to be bilateral more often [5,18].

Leukocytosis in addition to increased levels of CRP and ESR are standard features of ISI, while being inconsistent and non-specific [5,8,18,19].

MRI is the examination of choice for the diagnosis of ISI. MRI is capable of visualization of early active inflammatory changes of the sacroilitis, so the early diagnosis of sacroiliitis is usually established by MRI.

In the present study, bone marrow edema was observed in 40 patients. Bone marrow edema was noted with sacral predominance or ilium dominance or even distribution on the sacroiliac aspect. 28 (70%) cases showed even distribution of bone marrow edema involving the Sacro – iliac aspect, 9(22.5%) of them showed sacral aspect dominance and 3 (7.5%) of them showed iliac aspect dominance. (20)

Caspulitis was seen in 34(85%) patients. Extracapsular fluid collection was noted in 23 (57.85%) of the patients, while peri articular muscle edema was noted in 37(92.5%) of them. Joint space had widened in patients 29 (72.5%) but reduced in 3 (7.5%) of the study population. Similar findings were noted in the Carita Tsoi et al(21) as inflammation in infective sacroiliitis spreads to involve the peri-articular soft tissues, particularly the iliacus and gluteal muscles. Peri-articular fluid collection or abscess is practically pathognomonic of an infective sacroiliitis.

In a study by Klein et al. [22], all the cases of infectious sacroiliitis showed fluid or inflammation in the iliopsoas muscle that tracked posterior to the iliopsoas muscle. Le Breton et al. [23] reported that swelling of the muscles around the sacroiliac joint, which appeared as a decrease of fat between the iliacus and the psoas muscles, could confirm the diagnosis of infectious sacroiliitis. Our study results show that the presence of bone erosion, capsulitis, extracapsular fluid collection, and periarticular muscle edema on MRI suggest infectious sacroiliitis, whereas iliac-dominant bone marrow edema favor the diagnosis of sacroiliitis in spondyloarthritis.

The frequency of ISI without any identified pathogenic agent has tended to decrease over time, from 27% in the literature review of Mancarella et al. [8] to 25% in our series. When a microorganism was identified, Mycobacterium Tuberculosis was the most common pathogen (37.5%) followed by staphylococcus, streptococcus and pseudomonas. The definitive microbiological diagnosis may be based on blood cultures, joint fluid by CT-guided percutaneous puncture, or surgical investigations [2,6]. When performed, blood cultures are positive in 57.6% [18] to 69% [8] of adults and 45.5% of children [18]. Blood cultures contributed less (40%) in our study compared with the literature. (5)

CONCLUSIONS:

Infectious sacroiliitis is very uncommon. The diagnosis of ISI is long and difficult to establish. This diagnosis should be suspected in patients with confusing clinical symptoms (lowback pain, pubalgia, abdominal pain, and psoitis), and MRI of the SI should be performed depending on the rate at which symptoms progress. Mycobacterium tuberculosis

is the most common organism followed by staphylococcus aurens in infectious sacroiliitis. For tubercular sacroiliitis, the most common predisposing factors are chronic disease and pulmonary, abdominal or genitourinary tuberculosis. Laboratory values are nonspecific, with the most common abnormality being increased inflammatory markers (i.e., WBC, ESR and CRP). MRI is the most useful method to evaluate SI joint inflammation. MR imaging is the most sensitive imaging modality and may reveal enhancing fluid within the SI joint. earliest findings seen on MR include bone marrow edema of the iliac and sacrum, capsulitis, expansion of the SI joint and and extracapsular collection. In addition, you might see edema in the adjacent muscles and bone erosion. Therefore, the decision to treat must be correlated with clinical findings. However, MRI findings do not allow differentiation of the etiology of infectious sacroiliitis.

Three features of infective sacroiliitis are particularly helpful in differentiating infective from inflammatory sacroiliitis. First, bone marrow oedema in infective sacroiliitis tends to be more intense and there is more intra-articular fluid. Second, inflammation in infective sacroiliitis spreads to involve the peri-articular soft tissues, particularly the iliacus and gluteal muscles. Third, peri-articular fluid collection or abscess is practically pathognomonic of an infective sacroiliitis.

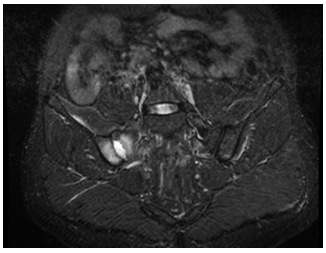

FIG-1 (A)

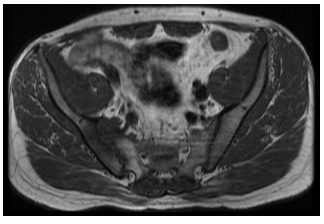

FIG-1 (B)

35 year old male patient diagnosed as infective sacroiliitis
A & B images A) cor stir image showing the bone marrow edema involving the iliac and sacral aspect of the right SIJ. Adjacent periarticular muscle edema and fluid signal intensity in the widened Right SIJ space. s/o capsulitis

B) Axial image showing the bony erosion involing the Right SIJ involving both the sacral and iliac aspect.

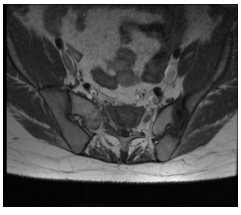

FIG- 2(A)

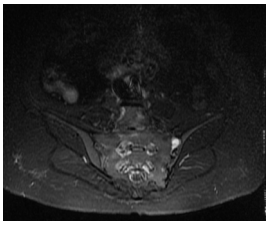

FIG- 2(B)

28 Year old female diagnosed as infective sacroilitis.
A)T1 image bilateral SIJ showing the bony erosion seen involving the iliac aspect of Left SIJ

B) MRI Coronal image of SIJ showing extracapsular collection around the left sacroiliac joint

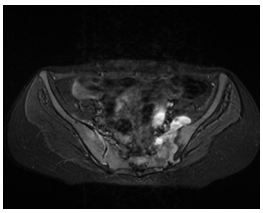

FIG- 3(A)

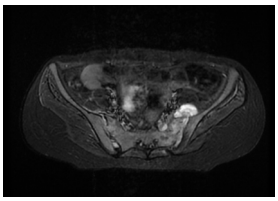

FIG- 3(B)

23 Year old female diagnosed as Bilateral infective sacroiliitis
A & B MRI axial stir images showing the extracapsular fluid collection adjacent to the left sacroiliac joint with fluid signal intensity in the left sacroiliac joint space and periaricular muscle edema (Iliacus) on the right side

REFERENCES:

1. Pertuiset E. Other causes of sacroiliitis as spondyloarthritis. Rev Rum. 2009; 76 (8): 750-60.
2. Osman AA, Govender S. Septic sacroiliitis. Clin Orthop 1995;313:214–9.
3. Chen WS. Chronic sciatica caused by tuberculous sacroiliitis. A case report. Spine 1995;20:1194–6.
4. A. Bellussi et al. / Journal of Clinical Imaging 26 (2002) 212–215
5. Hermet et al. BMC Infectious Diseases 2012, 12:305
6. Zimmermann B 3rd, Mikolich DJ, Lally EV: Septic sacroiliitis. Semin Arthritis Rheum 1996, 26:592–604.
7. Almoujahed MO, Khatib R, Baran J: Pregnancy-associated pyogenic sacroiliitis: case report and review. Infect Dis Obstet Gynecol 2003,11:53–57.
8. Mancarella L, De Santis M, Magarelli N, Ieradi AM, Bonomo L, Ferraccioli G:Septic sacroiliitis: an uncommon septic arthritis. Clin Exp Rheumatol 2009,27:1004–1008.
9. Vyskocil JJ, McIlroy MA, Brennan TA, Wilson FM: Pyogenic infection of the sacroiliac joint. Case reports and review of the literature. Medicine (Baltimore) 1991, 70:188–197.
10. Moros ML, Rodrigo C, Villacampa A, Ruiz J, Lapresta C: Septic shock in pregnancy due to pyogenic sacroiliitis: a case report. J Med Case Reports 2009, 3:6505.
11. Yansouni CP, Ponette V, Rouleau D: Bacterial sacroiliitis and gluteal abscess after dilation and curettage for incomplete abortion. Obstet Gynecol 2009, 114:440–443.
12. Chan DSY, Saklani A, Shah PR, Haray PN: Laparoscopic drainage of retroperitoneal abscess secondary to pyogenic sacroiliitis. Ann R Coll Surg Engl 2010, 92:32–34.
13. Le Bars H, Lamini N, Brunet J-F, Duval H, Samjee I, Minet J: Sacroiliitis due to Kingella kingae in an adult: updates on this pathogen. Ann. Biol. Clin. (Paris) 2010, 68:341–345.
14. Zrig M, Mnif H, Zrig A, Koubaa M, Jawahdou R, Mnari W: Iliopsoas abscess: a rare complication of pyogenic sacroiliitis in a child. Arch Pediatr 2010,17:141–143.
15. Taylor ZW, Ryan DD, Ross LA: Increased incidence of sacroiliac joint infection at a children's hospital. J Pediatr Orthop 2010, 30:893–898.
16. Vyskocil JJ, McIlroy MA, Brennan TA, Wilson FM: Pyogenic infection of the sacroiliac joint. Case reports and review of the literature. Medicine (Baltimore) 1991, 70:188–197.
17. Almoujahed MO, Khatib R, Baran J: Pregnancy-associated pyogenic sacroiliitis: case report and review. Infect Dis Obstet Gynecol 2003, 11:53–57.
18. Wu M-S, Chang S-S, Lee S-H, Lee C-C: Pyogenic sacroiliitis–a comparison between paediatric and adult patients. Rheumatology (Oxford) 2007,46:1684–1687.
19. Doita M, Yoshiya S, Nabeshima Y, Tanase Y, Nishida K, Miyamoto H: Acute pyogenic sacroiliitis without predisposing conditions. Spine 2003,28:384–389.
20. Yusuhn Kang, Sung Hwan Kong, Ji Young Kim, Hye Jin Yoo, Ja Young Choi, Minkyung Yi and Heung Sik Kang. Unilateral Sacroiliits: Differential diagnosis between infectious sacroilitis and spondyloarthritis based on MRI findings. American J of Roentgenology 2015;205(5):1048-1055.
21. Tsoi C, James Francis Griffith, Ryah Ka Lok Lee, Priscilla Ching Han Wong, Lai Shan Tam. Imaging of sacroilitis: Current status, limitations and pitfalls. Quantitative imaging in medicine and surgery 2019; 9(2):318-335.
22. Klein MA, Winalski CS, Wax MR, Piwnica-Worms DR. MR imaging of septic sacroiliitis.J Comput Assist Tomogr 1991; 15:126–132
23. Le Breton C, Frey I, Carette MF, et al. Infectious sacroiliitis: value of computed tomography (CT) and magnetic resonance imaging (MRI). Eur Radiol1992; 2:233–239