Frequency of Sacroiliac joint pain after Lumbar and Lumbosacral fusion.

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ABSTRACT

Objective: To determine the frequency of sacroiliac joint pain after lumbar and lumbosacral fusion.

Methods: This descriptive study was conducted in Orthopedic and Spine department Ziauddin University hospital Karachi from 20th February 2018 to 20th December 2021.We enrolled all adults patients of both gender fulfilling the inclusion criteria who were operated for successful lumbar and lumbosacral fusion for various indications. At 6th months post operative sacroiliac joint pain was diagnosed with local tenderness and pain at sacroiliac region with positive provocative FABER(Patrick) test, Posterior Shear test(Thigh Thrust test) and pain reduction of 60% or more on sacroiliac joint block(SIJ) injection. The intensity of pain was measured with Visual Analog Scale(VAS) on 100 mm scale with 0 indicated no pain and 100 sever pain. The VAS scale was utilized to measure pain reduction after SIJ block.

Results: In this study 597 patients were included. Male patients were 256(42.88%) and female were 341(57.11%).The mean age was 58.3±14 years. Spinal fusion levels were L4-L5 in 294(49.2%), L3-L4 in 180(30.15%) and L5-S1 in 123(20.60%) patients. Floating fusion was performed in 401 (67.16%) cases while fixed fusion in 196(32.83%) patients. Sacroiliac joint pain was documented in 81 (13.56%) patients at 6th months follow up. Pre injection mean VAS was 87±4 which was reduced to post injection 16±5.1.Patients with lumbar fusion of more than three levels and fixed fusion involving S1 had more frequency of pain than others($p< 0.05$)

Conclusion: Small proportion of patients had sacroiliac joint pain after lumbar and lumbosacral fusion. The frequency of sacroiliac joint pain was significantly higher in multilevel lumbar fusion and fixed fusion.

Keywords: Pedicle Screws, Spinal Fusion, Sacroiliac Joint, Spinal Stenosis.

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INTRODUCTION

Lumbar spinal stenosis is a debilitating disorder in the elderly population caused by degenerative disease processes like bone hypertrophy, facet joint osteoarthritis, ligamentous hypertrophy, disc protrusion and spondylolisthesis.[1] The treatment of lumbar spinal stenosis may include decompression and fusion or decompression alone and the patients usually improve after decompression whether it is instrumented or non-instrumented.[2] Lumbar spinal fusion is increasingly practiced nowadays as a treatment for a variety of lumbar diseases because of the availability of robust fixation options including pedicle screws and interbody fixation devices.[3] However fusion as opposed to decompression is a more complicated procedure because of increases post-operative complications and treatment costs[4] and failure rate of 5% to 30% have been reported in the literature.[5] Causes of low back pain after lumbar and lumbosacral fusion include sacroiliac joint pain, fusion hardware related low back pain due to

impingement of screw or rod over iliac crest, adjacent segment disease, multi-level spondylotic changes, Pseudoarthrosis, and iliac crest graft harvesting.[6] The frequency of sacroiliac joint pain after spinal fusion surgery ranges from of 10% to 40%.[7] Lumbar spinal fusion increase stress across the sacroiliac joint and results in low back pain.[8] Provocative clinical tests can diagnose sacroiliac joint pain but sacroiliac joint block(SIJ) injection is considered the gold standard for diagnosis and treating sacroiliac joint pain.[9]

The objective of our study was to determine the frequency of sacroiliac joint pain after lumbar and lumbosacral fusion.

METHODS

We conducted this descriptive study in Orthopedic and Spine department Ziauddin University hospital Karachi from 20th February 2018 to 20th December 2021. All adults patients of both gender requiring with lumbar disc herniation, degenerative disc disease and lumbar spondylolisthesis requiring spinal fusion and achieved successful fusion at six months follow up but with pain and tenderness at sacroiliac region were included in this study. All patients with S2A1 screws, Iliac Bolt Screws, re surgery and those with for traumatic spine fractures, infection, congenital deformities, rheumatoid arthritis, Ankylosing spondylitis, malignancy and those with extra-spinal causes of low back pain were excluded from our study. The study protocol was approved by the Institutional Review Board of our hospital. Informed written consent was obtained from all participant of our study. In the included patients complete history clinical examination and relevant investigations(spine radiographs and MRI) were undertaken. Decompression and fusion was carried out by the same team of orthopaedic surgeon following a uniform standard technique of decompression and pedicle screw fixation in all cases. Post operative follow up visits were scheduled at two weeks initially and then monthly. In each visit radiological and clinical assessment was carried out. At six months follow up visit post operative sacroiliac joint pain was diagnosed with positive provocative FABER(Patrick test),[10-12] Posterior Shear test(Thigh Thrust test)[13,14] and pain reduction of 60% or more following sacroiliac joint block(SIJ) injection. The intensity of pain was measured with Visual Analog Scale(VAS) on 100 mm scale with 0 indicated no pain and 100 sever pain. The VAS scale was utilized to measure pain reduction after SIJ block.[15] The SIJ block injection was injected with patient in the prone position using 22G spinal needle. Initially 1 ml of Iodixanol (®Visipaque) radiocontrast was injected under image intensifier to confirm sacroiliac joint followed by injection of 1.5 ml of 2% Lidocane and 1.5 ml of 0.5% Bupivacaine.[10] The FABER (Patrick test) and Posterior Shear test(Thigh Thrust test) were repeated. Post injection pain reduction was recorded on VAS scale.

We analyzed our data with SPSS 23. Frequency and percentages were calculated for qualitative data while quantitative data was represented as mean and standard deviation. Frequency of sacroiliac pain was noted and compared for important variables like age, gender, level of fusion, fixed fusion and floating fusion and *P* value was calculated with Chi-square test. *P* value <0.05 was considered statistically significant.

RESULTS

In this study 597 patients were operated for spinal fusion. Majority(57.11%,n=341) of our patients were female while male patients were 256(42.88%). The mean age was 58.3±14 years. Lumbar canal stenosis was diagnosis in 496(83.08%) cases followed by lumbar disc herniation in 63 (10.55%) and spondylolisthesis in 38(6.36%) of cases. Spinal fusion levels were L4-L5 in 294(49.2%), L3-L4 in 180(30.15%) and L5-S1 in 123(20.60%) patients. Floating fusion was performed in 401 (67.16%) cases while fixed fusion in 196(32.83%) patients. Sacroiliac joint pain was documented in 81 (13.56%) patients at 6th months follow up. Pre injection mean VAS was 87±4 87(range 66 to 91) reduced to mean 16±5.1 16(range 8 to 22) post injection. Degenerative changes at sacroiliac joints were noted on radiographs in 412(69.01%) patients. Patients with lumbar fusion of more than three levels, and fixed fusion involving S1(81 versus 67) had more frequency of pain than others(p< 0.05) No statistically significant(p >0.05) increased frequency of sacroiliac pain was noted when comparison was done for age and gender.

DISCUSSION

Post operative sacroiliac joint pain is an important outcome following spinal fusion nonetheless, it is difficult to diagnose it with 100% accuracy on physical examination alone.[16] According to Laslett [17] with two positive clinical challenge tests the sensitivity of the diagnosis is 93% and the specificity 66%.Diagnostic accuracy however can be enhanced by combining provocation tests with sacroiliac joint

pain and specific physical signs such pain below the L5 level and in the posterior superior iliac spine region as well as excluding other lumbar spine illnesses.[18]

In our study the frequency of post operative sacroiliac joint pain was 13.56% (n=81). Previous studies however reported variable frequency ranging from 16.2 percent to 43 percent.[6, 19,20] Ha and Lee[21] showed that there is no association between sacroiliac joint pain and the number of fused segments which is contrary to our results as we had noted that patients with lumbar fusion of more than three levels and fixed fusion involving S1 had more frequency of pain than others ($p< 0.05$). Yoshihara[22] was of the opinion that every patient with lumbosacral fusion if complaining of back pain must be evaluated for sacroiliac joint pain as imaging studies had revealed more frequent presence of degeneration of sacroiliac joint than in patients without fusion.

In our study degenerative changes at the sacroiliac joints were noted on radiographs in 412(69.01%) patients and we suggest this could be the possible cause of sacroiliac pain. Contrary to our results Shin and Ryu[23] analyzed the data of 346 patients with spine fusion and reported that increased pelvic tilt and decrease lumbar lordosis are the two main reasons for post operative sacroiliac pain.

We had not harvested bone graft from posterior iliac crest in our study. Many authors [24-26] however had shown that graft harvested from posterior iliac bone was responsible for post operative sacroiliac pain.

Our study had some limitations. The design of our study was descriptive. Our follow up period was short. We could not analyze the functional disability due to sacroiliac pain. We therefore recommend further studies to verify our results.

CONCLUSION

Small proportion of patients had sacroiliac joint pain after lumbar and lumbosacral fusion. The frequency of sacroiliac joint pain was significantly higher in multilevel lumbar fusion and fixed fusion. Optimum surgical strategies are therefore needed to avoid post operative pain in patients with spinal fusion.

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