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Original Article

Sacroiliitis Following Lumbosacral Fixation: Prevalence and Management

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BACKGROUND: Sacroiliitis following lumbosacral fixation is an important cause of postoperative low back pain and should be properly diagnosed and managed to improve the short- and long-term postoperative outcomes.

OBJECT: We aimed to assess the prevalence of sacroiliitis following lumbar fusion procedures and the possible options of treatment available for such complication.

METHODS: In this retrospective cross-sectional study, 100 patients who underwent spinal fusion surgery were included and observed for the next 3 months following surgery to detect postoperative sacroiliitis.

RESULTS: One hundred patients aged 23- 65 years were included in the current study, with a mean age of 43.1±5.7 years. Fifty seven percent were females and 43% were males. Forty-seven patients (47%), 22 females (46.8%) and 25 males (53.2%), experienced sacroiliitis after a duration of 23.7 to 71 days post-operative with a mean of 33.8±1.7 days post-operative. Muscle relaxants and non-steroidal anti-inflammatory drugs (NSAID) were prescribed to all patients; 26 out of 47 patients (55%) responded well to medical treatment for 28 days with reduction of pain visual analogue scale (PVAS) from 7.3±2.1 to 3.3±1.4. In 21 patients (45%), medical treatment failed and physiotherapy sessions were added to medical treatment for 28 days with improvement of PVAS from 6.5±1 after 28 days medical treatment to 2.9±1.9 after medical treatment plus physiotherapy sessions. Five patients needed intra-articular steroid injection with further improvement of PVAS to <1.

CONCLUSION: Sacroiliitis is an important cause of low back pain post lumbar fixation. Sacroiliitis is a frequent complication after lumbar fusion surgery detected in 47% of our study group. It was successfully managed with NSAIDs and physiotherapy in most of the cases.

KEYWORDS: Lumbar fixation, sacroiliitis, spinal fusion.

INTRODUCTION

Spinal fusion is a procedure that is increasingly performed in spine surgeries. It is performed in scoliosis, spondylolisthesis, canal stenosis and occasionally in simple disc prolapse or spine trauma.[1,2] There are several causes for low back pain following spinal fusion. Pain could be originating from tendons, muscles or back joints as sacroiliac joints.[3,4] Failed back surgery syndrome is one of the biggest fears for all surgeons. Failed back is the recurrence or persistence of symptoms following lumbar surgery. It may occur due to various reasons including adjacent segment failure, pseudoarthrosis or adjacent segment disc disease.[5]

Sacroiliitis following lumbar fusion may occur due to increased mechanical load transfer secondary to changes in the biomechanics of the spine following fusion. In such case, the mechanical load is transferred to the sacroiliac joints. Another important cause of postoperative back pain would be that sacroiliitis was already existing preoperative and missed in the patient examination.[6-8]

In most cases, sacroiliitis occur with no radiographic changes associated which makes diagnosing this complication clinical rather than radiological.[9]

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Sacroiliitis following lumbar fusion is a very important cause for post-operative back pain and when accurately identified and treated, it will definitely change the patient life style following surgery.[10] Diagnosis of sacroiliitis totally depends on the accurate analysis of patient's complaint and accurate physical examination. Clinical examination is reported to have a positive predictive value of 60% in diagnosing sacroiliac joint (SIJ) inflammation. Common tests used to detect sacroiliitis are flexion abduction external rotation (FABER) test, thigh thrust, and compression distraction test. Positivity of three or more of these tests could reach a sensitivity of above 90%.[10,11]

Once sacroiliitis as a complication of lumbar fusion is diagnosed, it can be managed by medical treatment. Medical treatment includes non-steroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, topical anti-inflammatory gels and sometimes, in chronic cases, anti-depressants can be added.[12] Adding a well-planned physiotherapy program to medical treatment can be helpful. Physiotherapy programs usually include strengthening of back muscles and pelvic mobilization exercises. Radiology guided injection of the inflamed joint with steroid is a last but not least resort in selected cases.[13]

In the current study, we aimed to detect the prevalence of sacroiliitis post-lumbar fixation surgery and to describe the methods used to manage this complication.

METHODS

The current study is a cross sectional retrospective study that included 100 patients who had spinal fusion surgery during the period from January 2019 to December 2019 in Beni-Suef University Hospital. Patients were followed up for the next 3 months following surgery to detect postoperative sacroiliitis. The study conformed to the provisions of the Declaration of Helsinki. All participants gave a written informed consent. The primary outcome of the study was the development of clinical sacroiliitis.

Inclusion criteria for the patients included:

- Absence of sacroiliitis on clinical examination before surgery.
- Improvement of the initial complaint either the back or leg symptoms.
- Non traumatic causes for spinal fusion.
- No neurological problem pre or postoperative.

All patients were subjected to full neurological exam and full history taking before surgery. Physical examination tests were applied to diagnose the presence of sacroiliitis if low back pain is detected in follow up after surgery. FABER test is performed by flexion, abduction and external rotation of the hip while stabilizing the hip by pressing on anterior superior iliac spine (ASIS). Distraction test is performed by applying pressure to both ASIS at the same times simultaneously with patient lying supine, perception of pain at the anatomical site of the sacroiliac joint is suggestive of inflammation. Compression test is performed with the patient lying on affected side and applying pressure over labrum by the examiner. In Ganslen's test, the affected leg is hanged over side of the examining table with the knee of the affected SIJ flexed to chest and stabilized by the patient and examiner. Thigh thrust is performed when the examiner passively flexes the patient's hip 90º and pelvis is stabilized by pressing opposite ASIS.[14] The increased pain at the site of sacroiliac joint by 3 or more of the above tests is highly suggestive of sacroiliitis with 91% sensitivity and 78% specificity.

Patients with the diagnosis of sacroiliitis were prescribed NSAIDs for a duration of 4 weeks. Twenty-one of sacroiliitis patients (45%) did not improve and were offered physiotherapy targeting the affected sacroiliac joint. Five patients needed intra-articular steroid injection after finishing 12 physiotherapy sessions.

Data were statistically described in terms of mean ± standard deviation (SD), median and range, or frequencies (number of cases) and percentages when appropriate. Two-sided *p* values less than 0.05 was considered statistically significant. All statistical calculations were done using the computer program IBM SPSS (Statistical Package for the Social Sciences; IBM Corp, Armonk, NY, USA) release 22 for Microsoft Windows.

RESULTS

One hundred patients aged 23- 65 years were included in the current study, with a mean age of 43.1±5.7 years. There were 57 females (57%) and 43 males (43%). Forty-seven patients (47%) experienced sacroiliitis, 22 females (46.8%) and 25 males (53.2%), after a duration of 23.7 to 71 days post-operative with a mean of 33.8±1.7 days post-operative. NSAIDs plus muscle relaxants were prescribed to all patients, with 26 out of the 47 patients (55%) responding well to medical treatment for 28 days with reduction of pain visual analogue scale (PVAS) from 7.3±2.1 to 3.3±1.4.

In 21 patients (45%), medical treatment failed to prove efficacy and physiotherapy sessions were added to medical treatment for another 28 days with improvement of PVAS from 6.5±1 after 28 days medical treatment alone to 2.9±1.9 after combined medical treatment and physiotherapy. Five patients needed intra-articular steroid injection after finishing 12 physiotherapy sessions with further improvement of PVAS to <1.

The involved levels of fixation in our patients were L4-L5-S1 fixation in 19 patients (40%), L5-S1 fixation in 17 patients (36%), and L4-L5 fixation in 11 patients (23%). Among the 47 patients' pain was in the contralateral side to the initial pain in 33 patients (70%) and in the ipsilateral side in 14 patients (30%). During physical examination, bilateral sacroiliac tenderness was found in 41 patients (87%), and unilateral in 6 patients (13%).

DISCUSSION

Sacroiliac joint is a synovial joint playing as a pivot point between the vertebral column and lower limbs, so it has a very important role in the weight transfer during walking. The joint motion is limited to translational and rotational motions. The average rotation varies between 1° and 12° and the average translation varies between 3 and 16 mm. These characteristics render the SIJ more liable to axial compression and rotational stress, but more resistant to lateral forces than the lumbar spine portion.[15]

Percentage of sacroiliitis following lumbar fusion in this study was 47% which is very near to previous studies in which it ranged from 16% to 43%.[3,7,15,16] Sacroiliitis is in direct relation to involvement of the sacrum in fusion operations and also related directly to the number of levels involved in the fusion operation and this is proven and emphasized by the study of Onsel et al.[1] This is consistent with the current study in which longer segments fixation had a share of 40% from the total number of patients with sacroiliitis and involvement of the sacrum correlated to 76% of the patients. In addition to these factors some authors emphasized on how the primary pathology can affect the percentage of sacroiliitis following fusion operations.[17,18] According to Kim et. al, other factors associated with developing sacroiliitis are sacral fusion and higher body mass index.[19]

There is no agreement on lines of treatment for SIJ pain after lumbar or lumbosacral fusion. However, studies are discussing the options available for conservatively controlling the pain originating from the sacroiliac joints, including drug therapy using NSAIDs and antidepressants.[4,9] This was consistent with our study in which 55% of the patients improved on NSAIDs.

The role of physical therapy in restoring the postural and dynamic balance of the muscles and correcting the gait problems resulting from fusion procedures is very important and so it has a vital role in pain control.[4] This is in concordance with this study in which 34% of the patients who had sacroiliac joint pain improved after physiotherapy with reduced PVAS from 6.5±1 to 2.9±1.9.

Sacroiliac injection with steroids under fluoroscopy is often therapeutic to relieve the symptoms, but their impact may not be long lasting.[20,21] This is consistent with our study in which 5 patients who were not satisfied after combined medical treatment and physiotherapy had sacroiliac injection with steroids under fluoroscopy with reduction of PVAS to <1.

CONCLUSION

Sacroiliitis following lumbar fusion may occur due to increased mechanical load transfer to the sacroiliac joints resulting from changes in the biomechanics of the spine following fusion. Rarely, authors reported that sacroiliitis has already existed preoperative and was missed in the patient examination. Sacroiliitis in most of cases occur with no radiographic changes associated which makes it totally dependable on the patient examination.

Sacroiliitis following lumbar fusion is a very important and common cause of post-operative back pain which was detected in 47% of our study group. It can be managed by NSAIDs, physiotherapy and intra-articular steroid injection.

List of abbreviations

ASIS: Anterior superior iliac spine.
FABER: Flexion abduction external rotation.
NSAID: Non-steroidal anti-inflammatory drugs.
PVAS: Pain Visual Analogue Scale.
SD: Standard deviation.
SIJ: Sacroiliac joint.
SPSS: Statistical packages for social sciences.
[7]

Disclosure

The authors report no conflict of interest in the materials or methods used in this study or the findings specified in this paper.

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