

Transiliac interpedicular screw rod with sacroiliac joint cannulated screw fixation: A treatment option for sacroiliac joint dysfunction

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Abstract

Sacroiliac joint (SIJ) dysfunction refers to the aberrant position or movement of SIJ structures that may cause low back pain. We report a case of right SIJ dysfunction, which was successfully managed by SIJ cannulated screw fixation and transiliac interpedicular screw and rod.

A 30-year-old female was involved in a motor vehicle accident and sustained anterior column of the right acetabulum fracture, right inferior pubic ramus fracture along with right SIJ diasthesis. She presented to us with right hip and lower back pain which led to a clinical diagnosis of right SIJ dysfunction. She underwent right SIJ cannulated screw fixation and transiliac interpedicular rod. Post-operatively, she was able to ambulate better with improving pain score upon subsequent follow-up visits.

Although transiliac interpedicular rod and sacroiliac joint screw fixation have been utilized in cases of unstable pelvic injury, literatures of applying this method of fixation to manage SIJ dysfunction are still limited. This case therefore illustrates the potential of said fixation as a method of providing additional stability in cases of SIJ dysfunction.

Keywords: *Sacroiliac joint, pain, dysfunction, transiliac interpedicular screw and rod, stability*

Introduction

The sacroiliac joint (SIJ) is a common cause of low back pain. SIJ dysfunction refers to the aberrant position or movement of SIJ structures that may cause low back pain.¹ Due to the complex anatomy and joint biomechanics, diagnosis and treatment of SIJ dysfunction has always been a challenge. Conservative management of SI joint dysfunction includes activity modification,

physical therapy, manipulation, modalities, orthosis and analgesia, while injections, radiofrequency procedures and surgery are the usual interventional management.

Injury to the ligaments that hold the SIJ in proper support is thought to be caused by a torsion or high impact injury (such as an automobile accident) or a hard fall, resulting in the hypermobility. While some manage with nonsurgical treatments, others have found that the only method to relieve pain was through surgery. We report a case of right SIJ dysfunction, which was successfully managed by sacroiliac joint cannulated screw fixation and transiliac interpedicular screw and rod.

Case Report

A 30-year-old female was involved in a motor vehicle accident in May 2018 and sustained anterior column of right acetabulum fracture, right inferior pubic ramus fracture along with right SIJ diasthesis. Post-trauma CT Pelvis performed showed undisplaced T type fracture of right acetabulum with right sacral alar fracture. She was initially managed conservatively with lower limb physiotherapy and analgesic medication. She presented to us 1 year and 7 months later post trauma with the chief complaint of right hip and right lower back pain since trauma despite X-ray showing united fracture sites. She had pain during walking which was exaggerated by climbing upstairs due to progressive nutation of her sacrum when she bends forward. Physical activities were limited with ambulation requiring walking aid. The SIJ pain had affected her quality of life and sleep. Clinical examination revealed tenderness over the right sacral area, right greater trochanteric and anterior right bikini line, along with positive Fadir and Faber test led to a clinical diagnosis of right sacroiliac joint dysfunction. She then underwent sacroiliac joint cannulated screw

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fixation and transiliac interpedicular screw with rod to achieve right sacroiliac joint stability. Intraoperative and postoperative imaging were shown in Figures 1b and 1c respectively. Post operatively, she was on strict non weight bearing for 6 weeks, which was followed by regular physiotherapy for ambulation, lower limb range of motion and water exercise. Till date, she has been on regular follow up in the advanced trauma clinic for 1 year and 6 months. She was able to ambulate without walking aid, and pain score has improved with improved quality of life.

Discussion

In our case, the right SI joint diasthesis occurred due to the disruption to the ligamentous support during the motor vehicle accident, leading to right SI joint hypermobility. She was treated conservatively initially, which led to the diasthesis being neglected. The clinical diagnosis was also supported by radiological finding as seen in Figure 1a which noted degenerative-like changes of her right SIJ such as hypersclerotic changes around the edges of the joint. As she walked, the right hemipelvis moved with slight rotation in addition to nutation of the sacrum which in turn exaggerated the joint friction and brought about pain.

SI joint dysfunction can be managed conservatively or with intervention. A study by Waisbrod et al. showed 70% success rate with SIJ arthrodesis among 22 patients with overt degenerative SIJ disease.²

Guemues et al. reported a method for percutaneous sacroplasty which introduced bone needle into the S1 vertebral body through the interpedicular approach as the treatment for sacral vertebral body pathologic

fractures.³ SIJ pain was also shown to have disease burden of at least as high as that associated with other musculoskeletal conditions often treated surgically like hip osteoarthritis, degenerative spondylolisthesis or spinal stenosis. For unstable pelvic ring fractures with type B or C1 fractures (based on the AO/ATO classification system), Toda et al. developed a minimally invasive fixation using a spinal implant that features a surgical transiliac rod and screw fixation (TIF) procedure.⁴ A similar technique utilising pediculoiliac screw fixation for 2 patients with sacroiliac joint disruptions and zone I sacrum too showed maintained fracture fragment reduction after reviewed on follow up 2 years post-operatively.⁵

However, there is still no report published regarding the use of such a method in the management of SI joint dysfunction. In our case of right SI joint dysfunction with C1 Tiles classification, there were both vertical and rotational instability. Figures 2a to 2e show the operative steps where the right sacroiliac screw fused the joint and limit its anterior posterior as well as vertical movement of right hemipelvis while the transiliac pedicle limits the rotation movement of right hemipelvis. As such, our method provided antero-posterior, vertical and rotational stability. Nutational stability was achieved.

Conclusion

Although transiliac interpedicular rod and sacroiliac joint screw fixation has been utilized in cases of unstable pelvic injury, literature on applying this method of fixation to manage SIJ dysfunction are still limited. This case therefore illustrates the potential of the said fixation as a method for providing antero-posterior, vertical and rotational stability in cases of SIJ dysfunction.

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Figure 1a
Pre-operative X-ray shows right sacroiliac joint diasthesis

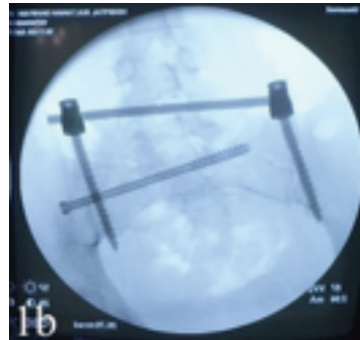


Figure 1b
Intra-operative radiology imaging shows fixation with transiliac interpedicular rod screw and right sacroiliac joint screw fixation



Figure 1c
Post-operative X-ray shows fixation with transiliac interpedicular rod screw and right sacroiliac joint screw fixation

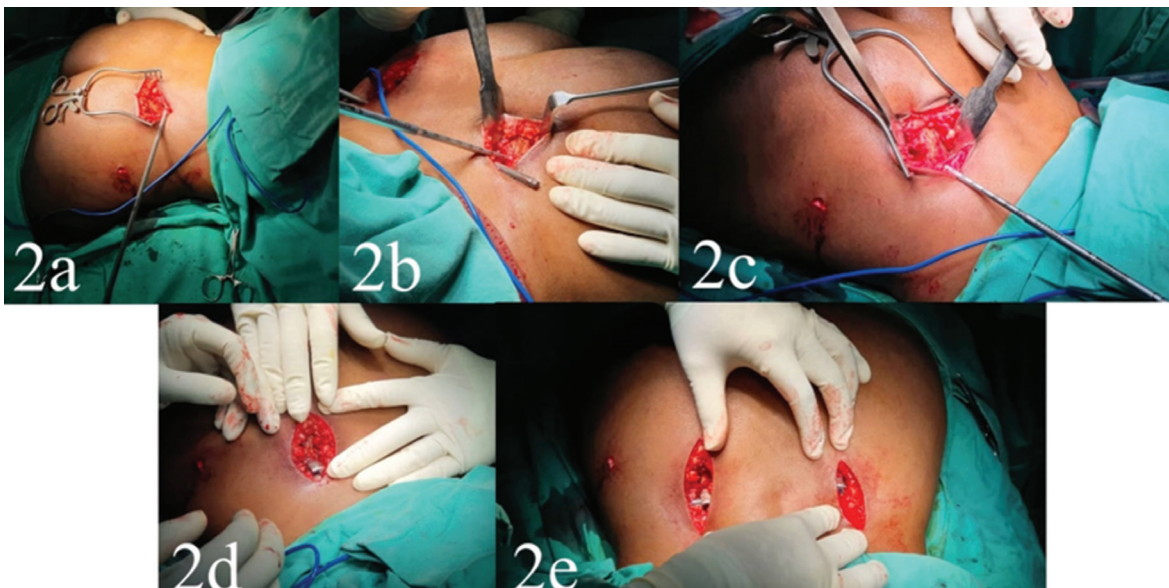


Figure 2a : Incision made over right posterior superior iliac spine (PSIS) after right SIJ screw insertion

Figure 2b: Transiliac rod spanning incision wounds over right and left PSIS with depth gauge to determine left pedicle screw length

Figure 2c: Depth gauge to determine right pedicle screw length

Figure 2d: Right pedicle screw inserted

Figure 2e: Wound condition post-interpedicular screws which is not prominent