Percutaneous Sacroiliac Fixation for the Sacroiliitis after Lumbosacral Fusion Surgery

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A 57-year-old woman presented with severe low back pain and pain in left buttock, which had persisted for 4 months. She underwent anterior lumbar interbody fusion with posterior screw fixation from L2 to S1 4 months ago. After the operation, she complained severe lancinating pain in left buttock and thigh which was aggravated during position change. Image studies showed no definite causable pathologic findings. We performed many kinds of block therapies. Among them, only sacroiliac joint block on the left side was effective for the patient’s pain temporarily. We performed percutaneous sacroiliac joint fixation on the left side. After the operation, the patient’s lancinating pain in the left buttock and thigh was improved.

Key Words: Lumbosacral fusion ㆍSacroiliac fixation ㆍSacroiliac joint block ㆍSacroilitis.
tion and physical therapy were no more effective. We performed lumbar epidural block, caudal block, lumbar facet block and rhizotomy, psoas compartment block and SIJ block. Among these block therapies, only SIJ block was effective for the patient's lancinating and pulling buttock and thigh pain temporarily. The duration of pain relief was about 1 day. The cramping pain was somewhat relieved by lumbar facet block. We performed percutaneous SIJ fixation on the left side. Postoperative plain radiography and CT scan showed good position of SIJ screws (Fig. 4). After the operation, the patient's lancinating and pulling buttock and thigh pain were improved about 70%. And the facet rhizotomy at L1, L2 and L3 on the left side was performed due to cramping pain relief. The patient's symptoms were relieved considerably and discharged. The patient is maintaining improving status 4 months after operation.

Operation technique
The patient was placed in the prone position: a radiolucent Wilson frame and Jackson tables were used. Under fluoroscopic guidance, the proper site for the incision was marked at 15 cm from the midline at S1 level. After a 1 cm skin incision as made, a guide pin was inserted. The first target point on the outer ilium is posterior wall of lamina just above of the S1 foramen on lateral view. Because it is very difficult to obtain a true lateral view of ilium, superimposition of both sciatic notches is important. Once a guide pin entered into the ilium, next target point is sacral promontory. It is safe as long as the guide pin remains above S1 foramen and below the upper endplate of S1 vertebra on AP and lateral view. After proper placement of guide pin, cannulate taper was inserted. We inserted 50 mm lag screw with 6.5 mm in diameter for the first screw. As for second screw, 45 mm screw was inserted. Second screw was inserted just be-
low of the first screw where was some space for screw inser-
tion in a same manner but less angulated in both cranial and
ventral. The operation was finished with one point of skin
suture.

DISCUSSION

Anatomically, the SIJ is a large diarthroidal joint that con-
nects the spine with the pelvis. It is a true synovial joint and
it is subject to degenerative changes like other joint. Proper-
sing SIJ function is the transfer of load from the axial spine to
the legs, and it requires ligamentous tension to be main-
tained and appropriately modified by pelvic and trunk mus-
culature. Many ligaments affect the stability of the SIJ. The
nerve supply to the SIJ is complex. Because there are vari-
ous levels of nerve innervation, pain from the SIJ may pres-
ent in a varied pattern. SIJ articular cartilage and surround-
ing ligaments have nerve fibers immunoreactive to pain medi-
dators. Therefore, SIJ dysfunction can cause low back pain
and sciatica.

Typical symptoms of SIJ dysfunction include unilateral or
bilateral low back pain below the waist that often radiates to
the ipsilateral groin, buttock, thigh, and rarely even the foot or
abdomen. The pain patterns of SIJ dysfunction are quite di-
verse and do not differ from other lumbosacral diseases such
as lumbar disc herniated nucleus pulposus, lateral recess
stenosis, facet joints or even the hip. There are more than
12 physical examinations for SIJ evaluation. The physical
examinations and image studies may be helpful, but these
are usually not diagnostic. Therefore, the spine specialists
often rely on controlled diagnostic SIJ blocks.

Degenerative joint disease, joint laxity, trauma and infe-
tion have been implicated in the etiology of SIJ dysfunction. In
addition, lumbosacral fusion surgery can be a cause of SIJ
dysfunction. In patients with previous spine surgery, SIJ dys-
function can be an even more important source of pain and
is one of the potential causes of failed back surgery syndrome.
SIJ is one of the segments adjacent to the fusion mass in
the lumbosacral spine and is affected by lumbosacral fu-
sion surgery. One article reported that SIJ degeneration de-
velops more often in patients undergoing lumbosacral fusion
regardless of the number of fusion segments. Another arti-
cle reported that lumbar spine fusion leads to increase of
motions at the SIJ and increase of stresses across SIJ arti-
cultural surface, which is increased as the number of fusion
segment increase. Also, SIJ dysfunction can be resulted
from iatrogenic injury to the joint itself. Excessive lumbosa-
cral dissection for the insertion of S1 screw or iliac bone graft
can cause sacroiliac ligament weakness and violation of the
synovial part of the SIJ. Prevalence of SIJ involvement in
postfusion low back pain ranges from 28% to 40%.

There are many treatment methods such as physical ther-
apy, intra-articular injection therapy, prolotherapy and oper-
ative treatment. Most patients respond to nonoperative treat-
ment, and few patients are required surgery. Surgical treat-
ment options include SIJ denervation and SIJ arthrodesis.
SIJ arthrodesis has been mainly used in patients with dis-
location and fracture dislocation of the SIJ. However, in the
case of intractable SIJ dysfunction, surgical treatment can
be chosen. The effectiveness of percutaneous SIJ fixation
with screws has been indicated by other studies. One arti-
cle about 3-year follow up of SIJ fixation reported 95% pain
relief. Another article mentioned that percutaneous sacro-
iliac fixation provided pain relief in all cases. In this study,
the mean visual analogue scores reduced from 8.2 to 2.2.

The loosening of percutaneous SIJ screws was reported
about 0% to 4.5%. The incidence of pedicle screw loos-
ing in thoracolumbar surgery was reported 2% to 7.6%. The
incidence of screw loosening was not different between
percutaneous SIJ screws and thoracolumbar pedicle screws.
The salvage techniques of pedicle screw loosening were us-
ing larger screws, screws with bicortical purchase, and aug-
mented screws with polymethyl methacrylate or milled bone.
In cases of screw loosening of percutaneous SIJ fixation, the
reported reoperation techniques were replacing the loosened
screw to larger screws and open SIJ arthrodesis with plate
fixation. If the screw loosening developed in our case, re-
operation using larger screws with or without augmentation
can be the treatment of choice.

CONCLUSIONS

Painful dysfunction of the SIJ can be resulted after lumbo-sacral fusion surgery. It can be a cause of postoperative continuous intractable low back and buttock pain, and one of the important causes of failed back surgery syndrome. Percutaneous SIJ fixation with screw is an effective method for the treatment of intractable SIJ dysfunction. However, it seems that surgeons need to consider more rigid sacroiliac fixation by adding iliac screws when performing long level lumbar-sacral fusion surgery.8

• Acknowledgments

This study is supported by a grant from Wooridul Spine Hospital.

• Conflicts of Interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of this paper.

REFERENCES