



Outcome of Internal Fixation and Corticocancellous Grafting of Symphysis Pubis Diastasis Which Developed after Malunion of Pubic Rami Fracture

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We report a case of pubic symphysis diastasis, which was initially asymptomatic; however, it became symptomatic with urinary incontinence during pregnancy. The patient was treated with open reduction and internal fixation of the symphysis pubis. A corticocancellous autograft was used for filling the gap which remained despite bilateral compression of the iliac bones. We obtained satisfactory outcome in terms of symptoms at the 3 years' follow-up; however, there was instability findings in the X-rays with broken screws. We conclude that asymptomatic pubic symphysis diastasis might be symptomatic after additional trauma (such as pregnancy) in the following days, if it was unstable in the very beginning of injury. Fixation of old pubic symphysis diastasis with reconstruction plate by filling the gap by using corticocancellous autograft, might not prevent ultimate implant failure if the symphysis pubis diastasis is part of an unstable pelvic fracture in the very beginning.

Key Words: Pubis, Symphysis, Diastasis, Pelvis, Fracture

Pelvic ring fracture, not being treated appropriately dependent upon various factors (i.e., intensive care of the critical patient), subsequently, might result in symphysis

pubis diastasis (SPD), with or without the malunion or non-union of pelvic ring¹⁻³. In the present study, we report a female patient with SPD which developed after malunion of pubic rami fracture. As the deformity was asymptomatic initially, it became symptomatic after childbirth. This is the first case which became symptomatic after pregnancy and improved following surgical treatment performed with internal fixation by using a corticocancellous autograft in the presence of implant failure findings in the X-rays.

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CASE REPORT

A 39 year old female patient presented to our institute with instability on the pubic symphysis. On examination there was a palpable gap in the region of symphysis pubis. Initial mechanism of trauma was a motorcycle accident

three years ago before the last admission to hospital. Initial fracture was classified as a combined mechanism according to the Young and Burgess' classification⁴⁾. The patient had undergone fixation with an external fixator (Fig. 1). Four months after the initial trauma, she reported no complaint other than insignificant leg length discrepancy which did not affect her. One year following injury she became pregnant. Gestation period proceeded in an uneventful manner. After childbirth (by caesarean section), the patient complained of pain on long distance walking and instability when she rolled to the lying position. When

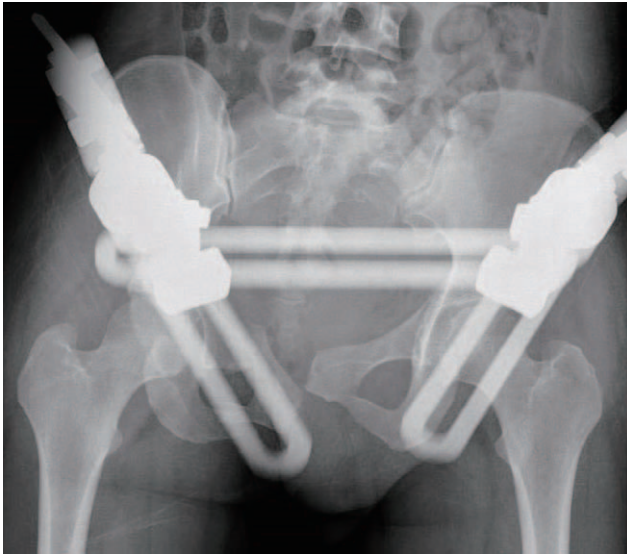


Fig. 1. Anteroposterior pelvis X-ray of patient just after fixation of the pelvis with external fixator. Although the symphysis pubis diastasis is reduced, the pubic bone looks displaced.



Fig. 2. Anteroposterior pelvis X-ray. Wide separation of pubic symphysis is seen with malunited pubic rami fractures on the right side.

she was asked whether she had the same complaints during the last trimester, she stated that she had not noticed among pregnancy-related changes. Furthermore, she reported to be experiencing urinary incontinence during some activities such as sudden forward bending. Standard anteroposterior (AP) X-ray examination revealed SPD (Fig. 2). Additional radiographic evaluation was performed using inlet, outlet pelvic radiographs and three-dimensional computed tomography scanning (Fig. 3). There was not any significant residual displacement in the axial and coronal plane, only in the sagittal plane.

After radiographic evaluation an operation was planned to close the gap by fixing with internal fixation. Operation was performed through a midline vertical rectus-splitting anterior approach after transverse skin incision. During surgery, the gap in the pubic symphysis was confirmed and closed to some extent when only firm, steady lateral compression was applied on the iliac crests; nonetheless diastasis still existed. It was decided to use corticocancellous autograft to both fill the gap and help with potential bony/fibrous fixation of pubic symphysis. The residual distance of the gap after maximum side to side compression of pelvis was measured. The bone graft which was 2-3 mm larger than this distance (to allow for some compression between the graft and symphysis pubis joint surface) was harvested from the contra lateral iliac crest of the patient. The fibrous tissue, which filled the separated symphysis pubis distance, was removed and both surfaces of the joint were decorticated to enhance bone healing. While the bone graft was compressed between the two

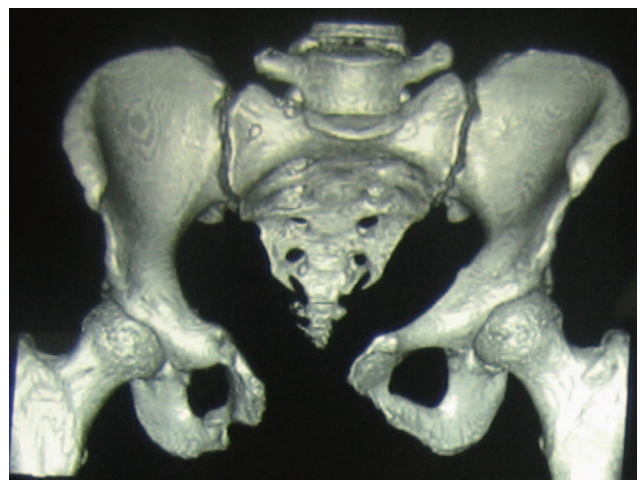


Fig. 3. Three-dimensional reconstruction of the pelvis. Notice the malunited the right pubic rami and symphysis pubis disruption. The fracture initially was treated with an external fixator.



Fig. 4. Early post-operative anteroposterior pelvic radiograph. Pubic symphysis is fixed with reconstruction plate by using autograft. Remaining gap is filled with corticocancellous autograft harvested from the contra lateral iliac bone.

articular surfaces of the symphysis pubis, the space was kept closed with bone clamp placed on both sides of the joint. In this position, the graft was temporarily fixed with K wire, which would not interfere with the placement of the plate. The pubic symphysis was fixed using a nine-hole 3.5 mm reconstruction plate (Fig. 4). The patient was allowed touch-down weight bearing for three months postoperatively. However, she discarded crutches one month post-operatively as she felt well in herself. Immediately after operation the urinary incontinence complaint improved and the pain also resolved shortly after.

Almost three years post-operatively patient was re-evaluated and informed consent was obtained. At the 3 years follow-up, pelvis was considered stable after clinical and radiographic examination. The patient expressed no sexual dysfunction, urinary incontinence or instability. There was no complaint related to the iliac crest from which autograft had been harvested. However she was suffering from occasional mild pain on the sacroiliac joint. Supine AP, inlet, outlet and single leg stance pelvic radiograph was obtained to evaluate pelvic instability, re-displacement of symphysis pubis and/or fixation failure (Fig. 5). Radiographs revealed that, although the reconstruction plate remained intact, some of the screws were broken (Fig. 5).

DISCUSSION

The symphysis pubis is an important structure that provides bladder neck support from the anterior on the



Fig. 5. Single leg standing anteroposterior pelvic radiograph. Some screws are broken (white arrow), however there is no further displacement of the pelvic ring under stress.

pelvic floor⁵. If the SPD exceeds 2 cm, pelvic floor support significantly reduces⁶. This results in the insufficient urethral closure pressure and urinary incontinence, in case of increased intra-abdominal pressure⁵. In these cases, the first treatment choice is not always surgery. If the SPD has occurred during birth, the symptoms may be improved by use of conservative treatment⁷. However, if the diastasis is larger than 2 cm and dependent upon malunited pelvic fracture, spontaneous healing is not likely to occur. In these patients surgical interventions is indicated⁶.

Whether or not associated with pelvis injuries, the most common fixation technique for symphysis pubis disruption is anterior plating. However, in critically ill patients, the external fixator can be used as an initial treatment in cases of associated life threatening hemorrhage. On the other hand, inappropriate treatment of unstable pelvic fractures, such as the use of an external fixator as a definitive treatment, results in pelvic deformity and/or instability, which lead to disability in future life². Also in the present case, the external fixator was used as initial treatment (Fig. 1). In the early period, pelvic stability was provided, by this way, despite malunited pubic rami fracture. However, the pubic symphysis, which was healed with enlarged distance, was not able to resist the stresses due to pregnancy, even though vaginal delivery did not take place. It was reported that, relaxation of ligaments and increase in the width of the symphysis pubis to occur through the course of pregnancy depend upon hormonally induced ligamentous laxity⁸. Therefore, pelvic instability or malunion in the female patient in childbearing age should be given serious consideration.

Oransky and Tortora² reported that, even though some

of the malunited pelvic deformities are possible to correct, higher rate of complication with residual deformity is frequent. In the present case, despite correction of malunited pubic rami fracture, achieving of symphysis pubis stability with plate fixation by using corticocancellous iliac bone graft was preferred. Seckiner et al.⁹ reported a successful repair of an old traumatic pubic symphysis diastasis using allograft. Our case, which has longer follow-up period, is different from this case, in terms of incomplete closure of the wider and more rigid pubic diastasis because of the displaced and malunited pubic rami fractures and symptoms developing after pregnancy. In the present case, to facilitate healing procedure and prevent anterior displacement of the bladder, we used corticocancellous autograft. By filling the gap with enblock autograft, we aimed to support the bladder, which is normally supported by the pubis and pubic symphysis anteriorly. As a result, no further urinary incontinence was occurred.

Morris et al.¹⁰ stated that the high rate of fixation failure has no significant effect on the clinical outcomes. Our findings support this claim. Although some of the screws were broken in the last radiographs of the present case, the pelvic symphysis was still reduced and the X-rays in the last follow-up, even in the one leg stance position, did not reveal any pelvic displacement in any of the three planes.

In conclusion, patients with incomplete reduction of pubic symphysis, even asymptomatic in the early period after injury, might become symptomatic in the following years with an additional trauma or stress (i.e., pregnancy). Furthermore, as an alternative treatment method, internal fixation of old SPD by filling the remaining gap with corticocancellous autograft might not provide sufficient pelvic stability sufficiently although accompanying symptoms might be relieved to some extent.

CONFLICT OF INTEREST

The author declares that there is no potential conflict of interest relevant to this article.

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