

# LOCKED PUBIC SYMPHYSIS: A CASE REPORT AND REVIEW OF LITERATURE

**Chee WH<sup>1</sup>, and Ahmad AR<sup>1,2</sup>.**

<sup>1</sup>Dept of Orthopaedics, Hospital Tuanku Jaafar, Seremban, Negeri Sembilan, Malaysia

<sup>2</sup>Pelvic and Advanced Trauma Surgeon, Head of Department, Hospital Tuanku Jaafar Seremban, Negeri Sembilan

## **Correspondence:**

Chee Wai Hong

Dept of Orthopaedics,

Hospital Tuanku Jaafar, Seremban,

Negeri Sembilan.

Phone number: +60122525287

Email: cheewaihong@gmail.com

## **Abstract**

Locked pubic symphysis is a rare form of pelvic injury that usually occurs after a lateral compression injury to the pelvis, where the intact pubis is trapped behind the contralateral pubis. To the best of our knowledge, there were 25 similar cases reported in the English literature since it was first described in 1952. We present a case of locked pubic symphysis with a left iliac wing fracture and a left femur shaft fracture requiring open reduction and internal fixation. We also reviewed previous reported cases of locked pubic symphysis and analysed the pattern of presentation and guide to management of such injuries. We propose a classification system for grading overlapping pubic symphysis that will provide a better guide to the management of such injuries.

**Keywords:** *Locked pubic symphysis, overlapping pubic symphysis injury, pubic symphysis dislocation*

## **Introduction**

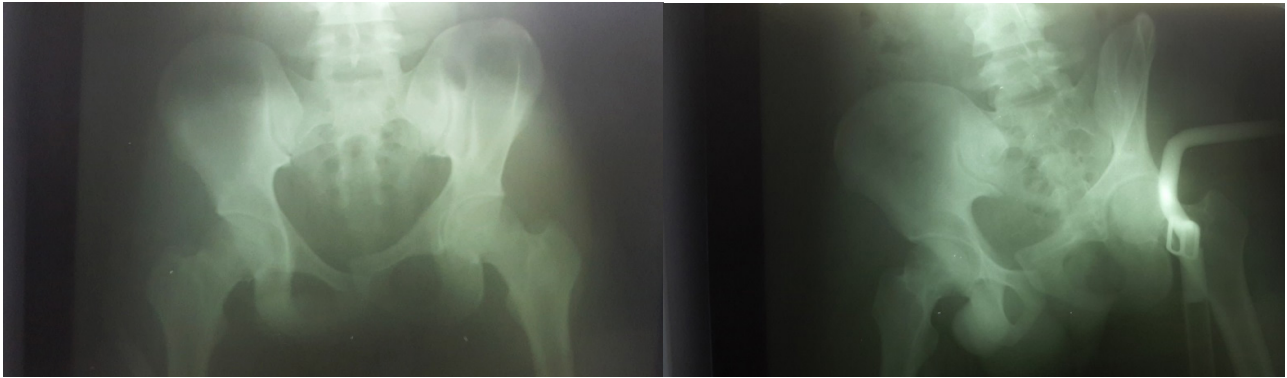
Locked pubic symphysis is a rare form of pelvic injury that usually occurs after a lateral compression injury to the pelvis, where the intact pubis is trapped behind the contralateral pubis. To the best of our knowledge, there were 25 similar cases reported in the English literature since first described by Eggers in 1952 (1). We present a case of locked pubic symphysis with left iliac wing fracture and left femur shaft fracture requiring open reduction and internal fixation. We also reviewed previously reported cases of locked pubic symphysis and analysed the pattern of presentation and guide to management of such injury.

## **Case Report**

In October 2014, a 23-years-old gentleman presented to Hospital Tuanku Ampuan Najihah, Kuala Pilah, Malaysia

following a motor vehicle accident. On arrival to the Emergency and Accident Department, his GCS was 7/15 (E1V1M5) with normal respiratory and haemodynamic status. He was intubated for airway protection. Further examination revealed no abnormality in the chest and abdomen region. Pelvic spring was negative. However, there was a marked swelling and deformity over the left thigh. A Foley's catheter was then inserted and the drained urine was clear.

Radiographs revealed a dislocated pubic symphysis with left iliac wing fracture, and fracture of the proximal third left femoral shaft (Figure 1). Computed tomography (CT scan) of brain, cervical, abdomen and pelvis were done and showed multiple intracranial bleeds, left iliac wing fracture with intact sacroiliac joint, and dislocated pubic symphysis (Figure 2). Abdominal and pelvic organs were intact, with no evidence of injury to the genitourinary system.



**Figure 1:** Anteroposterior view (left) and Left oblique view (right) of pelvic radiograph showing dislocation of pubic symphysis and left iliac wing fracture



**Figure 2:** 3D reconstruction images of the pelvis showing pubic symphysis dislocation with the left pubic bone dislocated posterior to the right, and left iliac wing fracture

Open reduction and internal fixation of the dislocated pubic symphysis, left iliac wing fracture, and left femoral shaft fracture was done on day 17 post trauma in view of his non-orthopaedic injuries and technical limitations of our hospital.

Open reduction of the pubic symphysis was performed through a Pfannestiel incision. Intraoperatively, it was noted that the left pubic bone was locked behind the contralateral side and reduction was unsuccessful by levering the pubic ramus, in combination with application of downward and outward pressure on bilateral iliac crests. Decision was then made to address the left iliac wing fracture first. Using an ilioinguinal approach, the left iliac wing was then exposed, reduced and secured with two reconstruction plates. Once the iliac fracture was reduced and fixed, reduction of the locked pubic symphysis was made possible by levering out the trapped pubic ramus. Reduction was then secured with one reconstruction plate across the pubic symphysis (Figure 3). Left femoral shaft fracture was then reduced and fixed with a broad dynamic compression plate.



**Figure 3:** Postoperative pelvis anteroposterior radiograph showing restoration of normal pelvic anatomy

At one month post trauma, he was able to wean off ventilatory support. At two months post trauma, his GCS was 12/15 (E4V2M6) but has yet to regain speech function. Cognitive recovery was showing progressive improvements. He was able to obey simple command. He

was able to sit up and be ambulated using a wheelchair. Urinary function was normal.

At nine months post operation, he was able to go back to his job as a factory production worker. He was able to ambulate with normal gait and able to squat down without pain or limitation of movements. Based on Majeed score for grading outcome of pelvic fractures (2), he obtained a score of 90 (excluding sexual intercourse function), which is graded as excellent. Urinary function was normal. Cognitive function has greatly improved although he was still having occasional behavioural changes.

### **Discussion and Literature Review**

Locked pubic symphysis injury was first described more than half a century ago by Eggers (1), and it remains a poorly defined or understood subject. There were only 25 such cases reported in the English literatures as of June 2016.

Webb (3) in 1977 described a case of overlapping pubic symphysis associated with urethral injury but without sacroiliac joint damage. Stable reduction was achieved with closed reduction, without internal fixation. However during long term follow up, patient had problem of impotence and groin pain on squatting. Robinson *et al.* (4) in 1989 described a successful closed reduction of locked pubic symphysis without urethral injury. Their patient was asymptomatic at follow-up.

Afshar and Koushkhari (5) recently described a case of overlapping pubic symphysis dislocation which was successfully reduced and maintained via closed reduction. Reduction was achieved by manipulating left femur in flexion, abduction and external rotation while pelvis was stabilized by manual pressure on the iliac wings. However post reduction CT scan showed a non displaced zone 2 left sacral ala fracture. Their patient had good return of mobility function and good pain outcome, albeit with urologic problem.

O'Toole *et al.* (6) in 2006 described an extreme case of locked pubic symphysis into contralateral obturator foramen which required open reduction and osteotomy of the undisplaced superior pubic ramus. Closed reduction was first attempted but to no avail. The open reduction was then performed through a Pfannenstiel incision with a modified Stoppa extension. Reduction was initially attempted using a femoral distractor and pelvic reduction clamp, however both methods were unsuccessful and the authors proceeded with osteotomy of the undisplaced superior pubic ramus. 2-pin external fixator was applied in view of compromised pelvic stability after osteotomy of pubic ramus and nature of injury. At eight months post operatively, their patient was able to return to competitive sports with no pelvic pain and normal sexual function.

Sreesobh *et al.* (7) also described another case of locked pubic symphysis into the contralateral obturator foramen in 2006. Their patient sustained overlapping pubic symphysis

dislocation with the right pubic bone locked into the left obturator foramen. Closed reduction was not attempted and open reduction was performed via Pfannenstiel incision. Reduction was achieved, although difficult, by levering out the locked pubic bone and fixed with two reconstruction plates across the pubic symphysis. At 18 months post operative, their patient was able to return to work with good functional outcome.

Thulasiraman *et al.* (8) in 2010 reported 3 cases of locked pubic symphysis which were all treated with open reduction and internal fixation. The first case involved locking of right pubic symphysis into the left obturator foramen. Closed reduction was attempted but was not successful. It was then successfully reduced with open reduction via Pfannenstiel incision, by levering the trapped pubic ramus and subsequently symphyseal plating was done. The second case involved overlapping of right pubis behind left pubis, associated with right iliac wing fracture and right sacroiliac joint disruption. Again, closed reduction was not successful and proceeded with open reduction and pelvic reconstruction plating. Pubic symphysis injury was addressed via a Pfannenstiel incision, reduced by levering the trapped pubic ramus and fixed with symphyseal plating. Right iliac wing fracture and right sacroiliac joint disruption were fixed with reconstruction plating. The third case had his right pubic symphysis locked into the left obturator foramen associated with right sacral ala fracture. Closed reduction was again unsuccessful, and proceeded with open reduction via Pfannenstiel incision. The authors described the method of reduction as such; with the limb in abduction, flexion and external rotation, a downward and outward force was applied to right iliac crest whilst the right pubis was pushed through the obturator foramen with rocking movement. Sacroiliac joint release was done to achieve reduction in sagittal plane. Pelvic reconstruction plating was subsequently done. All their patients showed good functional recovery and were able to ambulate well.




Maqungo *et al.* (9) also reported a case of locked pubic symphysis in 2010. The patient sustained locked pubic symphysis with a left sided zone 2 sacral fracture. On day three post trauma, closed reduction was attempted by flexion, abduction and applying an external rotation force on the left femur and using the femoral head as a lever. However, it was unsuccessful and they proceeded with open reduction and plating of pubic symphysis via Pfannenstiel incision. Reduction technique was described as "applying anterior and lateral pulling force directly on the pubic bone via the pointed reduction forceps with a simultaneous external rotation force applied on the left iliac wing". Left sacral fracture was fixed with fully threaded cannulated screw. Outcome was excellent as the patient was able to return to ballet dancing as early as four months post operative.

Maqungo *et al.* (9) also encountered a case of neglected overlapping pubic symphysis which was presented late to their institution. Their patient had an unreduced overlapping pubic symphysis associated with left zone

foramen is present, regardless of associated pelvic injury, open reduction and fixation are warranted. Overlapping pubic symphysis dislocation however should not be left unreduced as previously reported cases have shown poor functional and pain outcome.

With that in mind, we propose a new classification for overlapping pubic symphysis injury that describes the severity of overlapping and a guide to its management (Table 1).

**Table 1:** Grading, illustration and description of the proposed classification

Grade	Illustration	Description
Grade I	 <p style="text-align: center;">Grade I</p>	<p><b>Overlapping pubic symphysis dislocation.</b> Overlapping of pubic bone but within the width of contralateral pubic body</p>
Grade II	 <p style="text-align: center;">Grade II</p>	<p><b>Locked pubic symphysis.</b> Overlapping of pubic bone beyond the width of contralateral pubic body</p>
Grade III	 <p style="text-align: center;">Grade III</p>	<p><b>Incarceration of pubic symphysis into contralateral obturator foramen.</b></p>
<p>Each grade is then classified into subtype A and B where                      A: without posterior pelvic ring injury or associated with stable posterior pelvic ring injury                      B: with an unstable posterior pelvic ring injury</p>		

Stable posterior pelvic ring injury includes compression fracture of sacrum, fracture of sacral ala, and an intact posterior sacroiliac ligament. Unstable posterior pelvic ring injury includes sacroiliac joint dislocation or vertical shear, displaced sacral or iliac wing fracture, and torn posterior sacroiliac ligament.

Grade IA and IIA injuries warrant an attempt of closed reduction. Grade IB, IIB and III warrant an open reduction with fixation. In the case where grade IA or IIA injuries failed to be reduced by closed means or failed to maintain stability after reduction, open reduction and fixation are required.



CT scan is the choice of imaging modality to diagnose and classify, as well as to assist in pre operative planning of this injury. In instances where CT scan is not available, the authors recommend using plain radiograph of pelvic inlet view to diagnose and classify overlapping pubic symphysis injury.

### **Conclusion**

Locked pubis symphysis is a rare pelvic injury resulting from substantial lateral compression forces. To date, only a handful of case reports have described this kind injury and an organised classification or guide to management has yet to be established. However, as more cases are being reported, a pattern of presentation, management and complications are beginning to develop. From what we have learned, it is fair to attempt closed reduction in overlapping pubic symphysis dislocation without unstable posterior pelvic ring injury. Open reduction and fixation are warranted in cases of failed closed reduction, OPSD with associated unstable posterior pelvic ring injury, and locked pubic symphysis. Putting all this together, we suggest that rare pelvic injury to be classified as shown in Table 1.

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