Orthopaedics & Traumatology: Surgery & Research 100 (2014) 191–196

Available online at
ScienceDirect
www.sciencedirect.com

Elsevier Masson France
EM|consulte
www.em-consulte.com/en

Original article

Management of traumatic labral tear in acetabular fractures with posterior wall component

J.H. Yoo [a,*], J.H. Hwang [b], J.D. Chang [c], J.B. Oh [a]

[a] Department of Orthopaedic Surgery, Hallym University Sacred Heart Hospital, 896 Pyeongchon-dong, Dongan-gu, Anyang 431-070, Republic of Korea
[b] Department of Orthopaedic Surgery, Kangnam Sacred Heart Hospital, Hallym University College of Medicine, 948-1 Daerim 1-dong, Yeongdeungpo-gu, Seoul 150-950, Republic of Korea
[c] Department of Orthopaedic Surgery, Dongtan Sacred Heart Hospital, Hallym University College of Medicine, 40 Seokwoo-dong, Hwasung 445-907, Republic of Korea

ARTICLE INFO

Article history:
Accepted 13 December 2013

Keywords:
Acetabular fractures
Posterior wall component
Labrum
Traumatic tear

ABSTRACT

Background: Posterior labral tear is frequently encountered in acetabular fractures with posterior wall component (AFPWC). However, there has been very little information in the literature on the type and management of traumatic labral tears in AFPWC.
Hypothesis: Traumatic labral tear is a constant intracapsular injury in AFPWC and can be repaired using adequate methods according to its type and size.
Materials and methods: A retrospective study of 14 patients (mean age 38 years [16–58]) who underwent open surgery for AFPWC was conducted using prospectively collected data. The types of posterior labral tear were investigated at intraoperative examination through the ruptured joint capsule or its extension, and were concomitantly managed. Surgical outcomes were clinically assessed using Merle d'Aubigné (PMA) score and Visual Analog Scale (VAS), and radiologically evaluated at final follow-up.
Results: Posterior labral tears were present in all 14 patients. The types of labral tear were osseous avulsion and posterior root avulsion tear ($n = 9$), longitudinal peripheral tear and posterior root avulsion tear ($n = 2$), longitudinal peripheral tear ($n = 2$), and osseous avulsion tear ($n = 1$). All unstable labra in 12 patients (86%) were repaired. All avulsion tears of the posterior root were repaired using a suture anchor, longitudinal peripheral tears using suture fixation or/and suture anchors, and osseous avulsion tears using a spring plate. The mean PMA score and VAS were 16.4 (14–18) and 1.7 (0–3) at final follow-up, respectively. The radiologic grades at last follow-up were good or excellent in all patients.
Discussion: All AFPWC in this study consistently revealed posterior labral tear. Posterior root avulsion tears accompanied with osseous avulsion was the most common type. Torn labra should be repaired as much as possible if unstable, considering the important functions of a normal labrum; fixation using a suture anchor may be useful for an avulsion tear of the posterior root.
Level of evidence: Level IV, therapeutic case series.

© 2014 Elsevier Masson SAS. All rights reserved.

1. Introduction

Generally, an axial load applied to the femur with the hip flexed about 90°, drives the femoral head against the posterior articular surface of the acetabulum, which causes acetabular fractures with a posterior wall component (AFPWC) according to the degree of hip abduction [1–3]. The mechanism of injury that leads to these fracture types is mostly high-energy trauma such as a motor vehicle accident, which frequently causes concurrent posterior hip dislocation [2,3]. Considering this mechanism of injury, to varying degrees the posterior labrum may be injured in conjunction with comminution in the posterior acetabular wall and hip instability. However, to date there has been very little information in the literature on the type and repair of traumatic labral injury in acetabular fracture, especially in AFPWC.

This study is based on the treatment of 14 consecutive patients who underwent open surgery for AFPWC. Based on these findings, the hypothesis was put forward that posterior labral tears are a constant intracapsular injury in AFPWC and that close examination of tears during open surgery and the appropriate repair of unstable labra according to tear location and size are needed in AFPWC. The aim of this study was to report the presence and types of the labral tears identified during open surgery in AFPWC and our treatment methods of them.

* Corresponding author. Tel.: +82-31-380-3770; fax: +82-31-382-1814.
E-mail address: oships@hallym.ac.kr (J.-H. Yoo).

1877-0568/$ – see front matter © 2014 Elsevier Masson SAS. All rights reserved.
http://dx.doi.org/10.1016/j.otsr.2013.12.016

Table 1
Data for 14 patients with acetabular fractures with posterior wall component.

Case	Gender	Age	Side injured	Fracture type	Posterior DL	Associated injuries
1	Male	41	Left	PCW	O	Left PCL rupture
2	Male	27	Left	PW	O	Left tibia fracture
3	Male	24	Right	PCW	O	Multiple fractures in both upper extremities and right tibia
4	Male	54	Left	PW	O	Left PCL rupture
5	Male	44	Right	PW	O	
6	Female	58	Left	PCW	O	
7	Male	44	Left	PCW	O	Right radio-ulnar shaft fracture
8	Male	23	Left	PW	O	Left PCL rupture
9	Female	16	Left	PW	X	
10	Male	33	Right	TPW	O	Left patellar fracture and PCL rupture
11	Male	45	Left	TPW	O	
12	Male	42	Left	PW	O	
13	Male	53	Right	PCW	O	
14	Female	26	Left	PCW	O	Left radio-ulnar shaft fracture

PCW: posterior column and wall fracture; PW: posterior wall fracture; TPW: transverse and posterior wall fracture; DL: dislocation; PCL: posterior cruciate ligament.

2. Material and method

2.1. Patients

Between December 2007 and February 2012, 14 patients who sustained AFPWC and underwent open reduction and internal fixation by a single surgeon (JHY), were enrolled in the current study. Three patients who underwent conservative treatment with non-displaced or minimally displaced AFPWC and stable hip joints during the same period, were excluded. A retrospective study of this cohort was conducted with prospectively collected data. All surgical treatments and clinical follow-up visits were conducted at a university teaching hospital.

There were 11 male and 3 female patients with a mean age of 38 years old (range, 16–58 years old). The mechanism of injury in all patients was a motor vehicle accident and the left side was involved in 10 patients. Concurrent posterior dislocation of the hip occurred in 13 patients (93%). Other associated injuries were rupture of the posterior cruciate ligament in the ipsilateral knees of 3 patients and the contralateral knee of one, and concurrent fractures in upper or lower extremities in 5 patients (Table 1).

2.2. Surgical procedures and labral tears assessment

According to Letournel and Judet classification [1], there were posterior wall fractures in six patients, posterior column and wall fractures in six, and transverse and posterior wall fractures in two. Prior to surgery, 3-dimensional computed tomography (3-D CT) scans were taken in all patients for more accurate assessment of fracture pattern and a detailed preoperative plan [4]. Surgery was performed 4 to 12 days after the injury, according to the patient's condition. Surgery time ranged between 2 and 4.5 hours. All patients were operated on using Kocher-Langenbeck approach without surgical dislocation of the hip. Trochanteric flip osteotomy was performed to secure enough space for plating in only 6 patients, with superior extension of posterior wall fracture (Table 2). The hip joint was explored through the fracture site of the posterior wall and the ruptured capsule, with its extension as the case might be, to investigate the presence of associated labral injuries.

Labral tears were characterized as longitudinal peripheral tear at the junction of the labrum with the acetabular rim, posterior root avulsion tear close to the transverse ligament, osseous avulsion tear with an attached fragment of the posterior wall, or mixed tear, according to location and shape. Torn labra were defined as unstable in cases that those were considered to be interposed between the articular surfaces [5] or/and accompanied with posterior root avulsion tears. All unstable labral tears were repaired (Table 2).

Internal fixation was performed with one to two 3.5-mm reconstruction plates according to the fracture type and a spring plate was added when necessary. In cases with a bone defect in the posterior wall due to depression or comminution, cancellous bone harvested from the trochanteric osteotomy site or greater trochanter was packed into the bone defect site.

After surgery, non-weight bearing on the operated side was maintained for about 4 weeks; thereafter, tolerable weight bearing with a pair of crutches was allowed. Full weight bearing was permitted about 10 weeks after surgery, depending on the degree of radiographic consolidation of the fracture. Throughout the postoperative period, isometric quadriceps contraction exercise with the leg in extension was encouraged.

2.3. Methods of assessment

Clinical outcomes were evaluated using the Merle d'Aubigné (PMA) score [6] and a visual analog scale (VAS) [7] at final follow-up. The quality of reduction for the articular surface and the congruency of the hip joint were evaluated by postoperative plain radiographs using the Matta classification system of anatomic (0–1 mm), imperfect (1–3 mm), and poor (more than 3 mm) [2] and supplementarily reviewed on 3-D CT scans taken in all patients for detailed assessment of reduction and fixation status. The radiological evaluation at final follow-up was performed based on the criteria of Matta: excellent (a normal appearing hip joint), good (mild changes with minimal sclerosis and joint narrowing less than 1 mm), fair (intermediate changes with moderate sclerosis and joint narrowing less than 50%), and poor (advanced changes) [2]. During the follow-up period, complications such as reduction loss, infection, nerve palsy, post-traumatic arthritis, osteonecrosis of the femoral head and heterotopic ossification were investigated.

3. Results

3.1. Types of labral tear and their treatment

Posterior labral tears were confirmed in all 14 patients and unstable in 12 (86%). In a majority of the patients (11/14), labral tear revealed a mixed type. The types of labral tear were osseous avulsion tear and posterior root avulsion tear in 9 patients, longitudinal peripheral tear and posterior root avulsion tear in 2, longitudinal peripheral tear in 2, and osseous avulsion tear in 1. No patients had a radial tear (Fig. 1).

Posterior root avulsion tears were reattached to the original attachment site as close to the transverse ligament as possible using a 3.5-mm Corkscrew suture anchor (Arthrex, Naples, FL, USA).

Download English Version:

https://daneshyari.com/en/article/4081507

Download Persian Version:

https://daneshyari.com/article/4081507

Daneshyari.com