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## Original article

# Does pelvic injury trigger erectile dysfunction in men?

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## ABSTRACT

**Purpose:** Pelvic ring fractures constitute 3%–8% of all fractures of the skeletal system and are generally related with high energy trauma. Sexual dysfunction following pelvic fracture has a high incidence, and affects the male patients both physically and psychologically. In this study, we aimed to investigate the impact and frequencies of comorbidities such as erectile dysfunction (ED) with adverse sociocultural and psychological consequences for the patient who had a pelvic ring fracture.

**Methods:** This study included 26 men who corresponded to the inclusion criteria and agreed to participate our study.

**Results:** According to fracture types, most of our cases were Tile type A1 and type A2. Severe and moderate ED were detected in 46.1% (12/26) of these patients via the International Index of Erectile Function-5 questionnaire.

**Conclusion:** ED develops following pelvic fractures, especially in Tile type B and C pelvic fractures.

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## 1. Introduction

Pelvic ring fractures constitute 3%–8% of all fractures of the skeletal system and are generally related with high energy trauma.<sup>1–3</sup> Many morbidities of these fractures such as sexual dysfunction, urinary incontinence, permanent pain, extremity length discrepancy, and limping have been described in the literature,<sup>2–6</sup> and urogenital damage may occur via direct or indirect trauma with pelvic ring injuries.<sup>5</sup>

Sexual dysfunction following pelvic fractures has a high incidence, and affects the male patients both physically and psychologically.<sup>7</sup> The purpose of our study is to evaluate urogenital functions of the patients treated for pelvic ring fractures in the short-, and long-term under the light of the literature data, and

investigate the impact of treatment modalities and fracture types on urogenital functions.

## 2. Materials and methods

We retrospectively evaluated the patient records of 87 cases of pelvic ring fractures in men and women who referred to two separate trauma centers between April 2006 and November 2011. 26 men who corresponded to the inclusion criteria and agreed to participate in our study were recruited.

These patients were clinically evaluated according to the International Index of Erectile Function (IIEF)-5 criteria. For radiological evaluation, Tile classification system was used. Retrospectively evaluated patients were classified according to the age, gender, etiology of fracture, additional injuries, neurologic sequel in the extremities, site of fracture, duration of hospitalization, and types of treatment modalities. Clinical evaluations of the patients were performed at 1st, 3rd, 6th, and 12th months, and patients who attended follow-up visits regularly were assessed at annual controls after 12 months.

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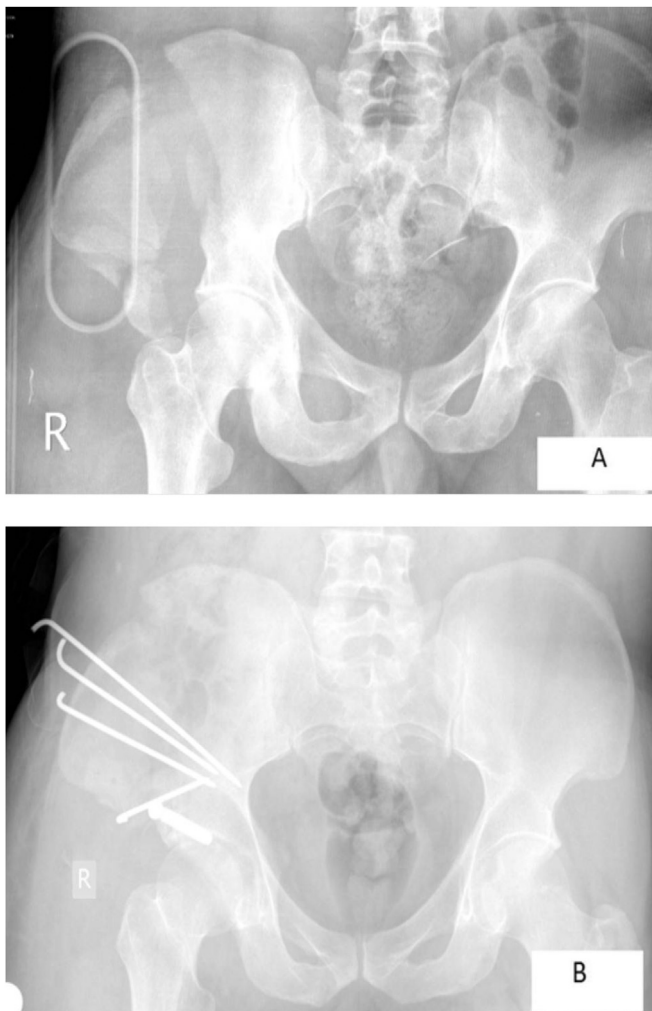
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All the data were recorded and analyzed using the SPSS 15.0. In intergroup comparisons of categorical data as statistical analyses, Chi-square and Fisher's exact test were used. Pearson and Spearman correlation analyses were conducted to detect correlations among age, fracture type, surgical history, and IIEF scores.  $p < 0.05$  was accepted as statistically significant.

### 3. Results

The most frequent etiological factor was extravehicular traffic accident which can be categorized as high-energy trauma. The mean age of our study group was 42.6 (20–68) years. Mean follow-up period was 38.3 (range, 12–63) months.

According to fracture types, most of our cases were Tile type A1 ( $n = 12$ , 46.2%) and type A2 ( $n = 4$ , 15.4%), and remaining ( $n = 10$ , 38.4%) were type B and C, which were probably unstable and theoretically would require surgical stabilization. But only four of these 10 patients were operated on for pelvic fractures. Pelvic external fixator was applied to 3 of them, while one patient underwent open reduction and internal fixation (Fig. 1), two of the operated patients had mild-moderate ED and 10 of the non-operated patients had severe or moderate ED and there was no correlation between the operation and ED (Table 1).



**Fig. 1.** A 42-year-old male patient was exposed to extravehicular motor road accident with resultant development of Tile type pelvic ring fracture (A). He was treated by open reduction and fixation with K-wire and screws (B).

**Table 1**

Correlation between operation and severity of erectile dysfunction.

IIEF group	Surgery				Total		$p^a$
	Yes		No				
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Severe + moderate	2	50.0	10	45.5	12	46.1	1.000
Mild moderate + mild	2	50.0	12	54.5	14	53.9	
Total	4	15.4	22	84.6	26	100.0	

<sup>a</sup> Fisher's exact test scores.

When these patients were evaluated for comorbid injuries, an additional morbidity was detected in 11 cases (42.3%), 4 of which (15.4%) had an extremity/long bone fractures, 3 (11.5%) had acetabular fractures, 2 (7.7%) had calcaneal fractures and 2 (7.7%) had soft tissue problems out of the pelvic region.

Severe and moderate degrees of ED were detected in 46.1% (12/26) of male patients via IIEF questionnaire. ED was most frequently seen in 8 cases with mild-moderate involvement. But penile Doppler was not performed for arterial flow in ED cases except in one patient who wanted to be treated for ED. Posttraumatic total testosterone values of patients were in normal range, and patients had sexual desire in our patient group. In addition, no testicular damage was seen in patients.

When we evaluated our cases according to Tile fracture classification, and compared the distribution of ages and IIEF scores between groups, we found milder forms of ED in type A1, and A2 pelvic fractures, and severity of concomitant ED (if present) increased in line with the complexity of the fractures.

### 4. Discussion

In this study, we aimed to investigate the impact, and frequencies of comorbidities such as ED with adverse sociocultural, and psychological consequences for the patient whom had a pelvic ring fracture.

Pelvic fractures are frequently encountered orthopedic entities with a high incidence of comorbidities. Many life-threatening traumas such as cerebral (37%–50%), chest (25%–66%), and abdominal injuries (42%–51%) can accompany pelvic fractures.<sup>6</sup> Apart from these major concomitant injuries urethral damage (7.5%), urinary tract bleedings (6%), and urogenital system injuries such as penile and vaginal (1%) traumas can occur.<sup>4,8,9</sup>

Tile fracture classification was used in the evaluation of our cases. It classifies fractures according to their stability as stable (type A), rotational unstable–vertical stable (type B), and rotational + vertical stable (type C),<sup>10</sup> which are important in revealing the mechanism of the injury. Evaluation of our cases disclosed that the most frequently detected fracture was of Tile type A (61.6%), followed by Tile type B (23%), and Tile type C (15.4%) in accordance with the literature. Still in line with the literature, pelvic fractures most frequently happened during motor vehicle accidents (69.3%).<sup>6,11</sup>

ED is encountered in men with increasing frequency, and its incidence climbs with aging, adversely affecting individuals both physically and psychologically.<sup>7,12</sup> Following pelvic fractures, neurogenic and vascular damage via direct or psychogenic mechanisms can occur.<sup>12,13</sup> King<sup>14</sup> and Malavaud et al<sup>15</sup> detected ED in 5%–24% of pelvic fracture patients without urethral injury. Even though urethral damage was not detected in any of our cases, moderate and severe ED assessed by IIEF scoring system was detected in 46.1% of them. None of these cases had urethral trauma at admission. One case with there pelvic fracture, and urethral

injury at admission was operated on by our urologists, and excluded from our study. Besides, when we compared ED with the severity of fracture, we found that the severity of ED increased with the complexity of fractures. Also, a moderate level of statistically significant negative correlation was found between IIEF scoring system and Tile fracture classification ( $p < 0.05$ ).

This result suggests that ED develops following pelvic fractures, especially at an unexpectedly high incidence after Tile type B, and C pelvic fractures. We believe that compression and distraction in type B injuries and posterior ring disruptions in type C seemed to increase the risk of ED and this is independent of surgery because dysfunction occurs during the accident. Therefore, during patient follow-ups ED should be absolutely kept in mind. Patients and their relatives should be informed about this complication.

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