



PFUI-RELATED COMPLICATIONS REVIEW

The incidence of erectile dysfunction after pelvic fracture urethral injury: A systematic review and meta-analysis



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Erectile dysfunction;
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ABBREVIATIONS

PFUI, pelvic fracture
urethral injury;
ED, erectile dysfunction;

Abstract Background: Pelvic fracture urethral injury (PFUI) is associated with a high risk of erectile dysfunction (ED). The effect of the type of posterior urethral disruption repair on erectile function has not been clearly established. We systematically reviewed and conducted a meta-analysis of the proportion of patients with ED at (i) baseline after pelvic fracture with PFUI, (ii) after immediate primary realignment, and (iii) after delayed urethroplasty.

Methods: Using search terms for primary realignment or urethroplasty and urethral disruption, we systematically reviewed PubMed and EMBASE. A meta-analysis of the proportion of patients with ED was conducted assuming a random-effects model.

Results: Of 734 articles found, 24 met the inclusion criteria. The estimate of the proportion (95% confidence interval) of patients with ED after (i) PFUI was 34 (25–45)%, after (ii) immediate primary realignment was 16 (8–26)%, and after (iii) delayed

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IIEF, International Index of Erectile Function

urethroplasty was an additional 3 (2–5)% more than the 34% after pelvic fracture in this cohort.

Conclusions: After pelvic fracture, 34% of patients had ED. After primary endoscopic alignment, patients had a lower reported rate of ED (16%). Delayed urethroplasty conferred an additional 3% risk above the 34% associated with PFUI alone, with 37% of patients having *de novo* ED. The difference in *de novo* ED after primary endoscopic alignment vs. delayed urethroplasty is probably due to reporting differences in ED and/or patients with less severe injury undergoing primary realignment.

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Introduction

The incidence of pelvic fracture urethral injury (PFUI) is estimated at 1.54–10% [1–3]. It is associated with a high incidence of erectile dysfunction (ED) due to traumatic neurogenic, vasculogenic, and direct crural or tunica albuginea injury, resulting in intracorporal fibrosis or venous leakage [4,5]. It is difficult to differentiate between ED due to PFUI and *de novo* ED due to urethral realignment or delayed urethroplasty, unless patients are assessed for ED at several times, ideally before and after injury, as well as before and after repair. Wright et al. [6] showed that PF alone, irrespective of UI, is a risk factor for ED, with a 21% risk. In fact, the urethral injury is probably just a surrogate for severe and localised trauma to the penis and its vascular and neurological inputs.

Researchers often compare the outcomes of primary realignment and delayed urethroplasty for PFUI [7–11]. Outcomes can be biased, as primary realignment might be attempted more frequently and might have greater success rates in men with less severe pelvic and urethral injuries, such as partial urethral disruption [12]. Less information on ED outcomes for primary realignment and delayed urethroplasty is available because most studies focus on resolution of the urethral stricture as the primary outcome. Although some reports compared primary realignment and delayed urethroplasty for PFUI on the outcome of ED [13], most of the studies identified in the present systematic review describe outcomes from one procedure or the other with little synthesis of this information. We sought to examine if one procedure portended better outcomes for ED over the other. The purpose of this study was to systematically review and meta-analyse the proportion of patients with ED (i) at baseline after PF with PFUI, (ii) *de novo* ED after immediate primary realignment, and (iii) after delayed urethroplasty.

Methods

Previously described methods for conducting appropriate systematic review and meta-analyses were followed

when constructing the search and synthesising information [14,15]. A medical librarian aided in the selection of the search terms. We used PubMed Medical Subject Headings (MeSH/mh), the Cochrane Database and Embase for the search, with the terms (('realignment') OR ('alignment') OR urethra/surgery[mh]) AND (disruption OR injury OR trauma OR distraction) AND (urethra OR urethral)). The search was conducted in May 2012. Pre-determined search-term limits included articles written in the English language, articles from the past 15 years, articles with 10 or more patients, and adult patients. All articles were selected for inclusion and exclusion by two authors, who reached consensus agreement through discussion and review with the other authors. The references for each article were manually searched to assess for any additional articles for inclusion, and expert opinion. 'Grey articles' with information from conference proceedings and abstracts were included when using the Embase database search.

Studies were included for meta-analysis if they reported the proportion of patients with ED at one or more of the following times: (i) after injury but before delayed urethroplasty; (ii) after immediate primary realignment; (iii) after delayed urethroplasty. Patients who underwent primary realignment had no assessment of ED after injury and before the realignment procedure, because primary realignment was undertaken within hours to days after injury. A meta-analysis of the proportion of patients with ED was conducted assuming a Freeman-Tukey random-effects model [16].

Methods for primary realignment have changed over time, especially with the introduction of flexible ureteroscopes, the wider availability of fluoroscopic imaging, and the modernisation of endourology equipment. For this reason we limited our examination to studies completed in the last 15 years.

Results

The search identified 914 articles with 637 English language articles. Of the articles identified with the search, 24 reported the proportion of patients with ED at one or more of the times of interest and met the inclusion crite-

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