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Original Article

Emergency treatment of male blunt urethral trauma in China: Outcome of different methods in comparison with other countries

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Abstract Treatment of male urethral trauma is always a challenging problem. In China, as the incidence of urethral trauma keeps rising, more and more studies relating to this are being published. To compare the outcome of different emergency treatments in China and other countries, we searched Chinese and English literature about this topic in the past 13 years. One hundred and seventeen studies involving 3880 patients were included, 102 in Chinese and 15 in English. All studies were retrospective in nature. On analyses, surgical methods include open realignment, endoscopic realignment and primary repair, we summarized and compared the success rate and complications (mainly Erectile Dysfunction (ED) and incontinence) of each method. We found that realignment of posterior urethra has similar success rate in both China and other countries, but the outcome of realignment of anterior urethra is variable in both parts of the world. The reason remains unknown. While long abandoned in western countries, primary repair of anterior urethra is still an option in China and has high success rate.

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Q3 1. Introduction

Based on urogenital diaphragm, urethral injuries (UI) could be divided into anterior urethral injury (AUI) and posterior

urethral injury (PUI). UI mostly occurs in men, and are usually blunt trauma without penetrating wound. The emergency treatment of urethral injury is very important to the patient's prognosis. If not treated properly, simple

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urethral trauma could lead to infection, fistula, urethral stricture, incontinence or impotency, significantly compromising the patient's quality of life and increasing the difficulty of further treatment [1,2]. However, the urologists worldwide have not yet reached an agreement in many aspects of the treatment of urethral trauma. China is the most populated country in the world, and the rapid development of labor intensive industries in the last decade has led to large number of urethral trauma cases. In Chinese literature, there are many studies about the treatment of UI. Comparing these with the studies in English literature, which have rather low sample amount, the large number of patients in Chinese studies could provide useful information. However, the emergency treatment of UI in China is somewhat different from developed countries. In this article, we review reports from both China and other countries, comparing surgical methods, outcome and complications, and analyze the cause for the difference. We want to report the current trends in managements of urethral trauma in China, compare it with those in other countries, and try to find out their advantages and disadvantages.

2. Materials and methods

Search for Chinese literature was performed using domestic search engines (CqVIP, WanFangData and CNKI). Search key words included "urethral realignment", "urethral injury", "primary repair", "straddle injury", and "endoscopic realignment" (all in Chinese). Only the studies with exclusive information about history, surgery method, follow-up and complications were included. One hundred and two studies dating from 2001 to 2013 entered this research, including 29 about endoscopic realignment (ESR) of anterior urethra, 22 about primary open repair of bulbar urethra, 39 about open realignment (OR) of PUI and 12 about ESR of PUI. A search of the English literature was performed with PubMed using the same key words. Fifteen studies were included, including four about ESR of anterior UI and 11 about ESR of posterior UI. All of them were retrospective studies. In this review we analyzed these studies, reported the outcome of different emergency treatments, summarized the opinion of urologists from China and other countries, and compared their differences.

Because all the studies included were retrospective studies, the method of meta-analysis is not applicable here, as it requires randomized-controlled trials. Due to the heterogeneity of these studies, analytical statistic methods like chi-square test and student *t*-test are also not applicable. Hence, we summarized the results of different studies and compared them to show the outcome of each treatment. Due to the large number of Chinese studies (102 in total) we only showed the cumulated results. Their results were not listed individually.

3. Outcome of different emergency treatments

Emergency treatments of UI include cystostomy, primary realignment (open or endoscopic) and primary open repair. Most studies have reported that the rate of urethral stricture is consistently over 90% after cystostomy, so the result

of cystostomy is not the focus of this review. In Chinese literature, the most reported emergency treatment of PUI were OR (39 studies) and ESR (12 studies), while the most reported treatment of AUI were ESR (29 studies) and primary open repair (22 studies). In contrast, in English literature there were no reports about OR in the past 10 years. ESR and cystostomy were the most frequently used treatments. We only found one study about primary repair of AUI in English literature.

Table 1 listed the results of 15 studies about ESR in English literature. The success rate of ESR in posterior UI ranged from 22.2% to 76.0%. Average Erectile Dysfunction rate was 19.8%, and in one study it was as high as 38.9%. Three studies reported high rate of incontinence (16.7%, 54.5%, 17.5%), while the rest eight studies reported no incontinence. There are fewer studies about ESR in anterior

Table 1 Studies in English literature about the treatment of urethral injury.

Study	Country	Cases	Success (%)	ED	Incontinency
Endoscopic realignment for posterior urethra					
Kim et al. 2013 [3]	US	18	10(55.6)	7	3
Olapade et al. 2010 [4]	Nigeria	10	5(50.0)	— ^a	—
Sofer et al. 2010 [5]	Israel	11	6(54.5)	—	6
Ku et al. 2002 [6]	Korea	35	14(40.0)	4	—
Shrestha et al. 2013 [7]	Nepal	8	6(75.0)	1	—
Moudouni et al. 2001 [8]	France	27	15(55.6)	4	—
Leddy et al. 2012 [9]	US	18	4(22.2)	4	—
Healy et al. 2007 [10]	Ireland	8	6(75.0)	3	—
Salehipour et al. 2005 [11]	Iran	25	19(76.0)	4	—
Mouraviev et al. 2005 [12]	US	57	29(50.9)	19	10
Boulma et al. 2013 [13]	Tunisia	20	13(65.0)	1	—
Endoscopic realignment for anterior urethra					
Seo et al. 2012 [14]	Korea	51	31(60.8)	—	—
Ku et al. 2002 [15]	Korea	65	53(81.5)	2	—
Elgammal et al. 2009 [16]	Brazil	22	4(18.2)	—	—
Park et al. 2004 [17]	US	6	0(0.0)	—	—
Primary repair of anterior urethra					
Gong et al. 2012 [18]	Korea	17	15(88.2)	3	—

^a "—" means none or not reported.

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