

HOSPITAL PHYSICIAN®

UROLOGY BOARD REVIEW MANUAL

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The *Hospital Physician Urology Board Review Manual* is a peer-reviewed study guide for residents and practicing physicians preparing for board examinations in urology. Each manual reviews a topic essential to the current practice of urology.

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Renal Trauma

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Renal Trauma

Bernard Fallon, MD

INTRODUCTION

Although urogenital trauma is relatively rare, urologists should be familiar with the management of genitourinary injuries, as trauma surgeons may be unfamiliar with the anatomy and surgery of the urinary tract. This manual reviews the evaluation of renal injury as well as describes the classification and management of renal trauma. A future manual will discuss ureteral injuries and management of ureteral trauma.

EPIDEMIOLOGY OF UROGENITAL TRAUMA

Epidemiologic data for renal trauma are highly variable. This variability can be partly attributed to the different etiologies of renal injury (ie, blunt or penetrating). In addition, some studies describe renal trauma as experienced during war, whereas others relate to renal injury as a result of daily life (eg, motor vehicle accidents, gunshot wounds, stab wounds), adding to the variability in reported statistics. A German study reported that of 385 patients who suffered urogenital trauma, 83% were male.¹ The principle etiologies were road traffic accidents (41%), other accidents (26%), sexual activities (8%), and violence (6%). Renal injuries accounted for 51% of cases, while the remaining injuries were evenly divided between the bladder, urethra, penis, and scrotum and its contents. Half of these patients had associated intra-abdominal or pelvic injuries. Overall, approximately 40% of these injuries were deemed to be severe.¹

Although road traffic accidents are the principal civilian cause of urogenital trauma, these injuries are nevertheless relatively rare in such accidents, with only 199 cases occurring in a registry of 43,056 victims of road traffic accidents (0.46%).² Of these 199 cases, the kidney was most commonly injured (43%) followed by the testis or scrotum (32%), bladder (11%), penis (9%), and urethra or adrenal gland (5%). Interestingly, a major difference was reported in the type of genitourinary injury in motorists (65% kidney, 16% bladder) compared with motorcyclists (64% testis/scrotum/penis, 28% kidney); however, most patients were young men (152 men, 47 women; mean age, 30.4 years), a fairly typical

sex and age distribution compared with other studies. In a study based on the National Trauma Data Bank,³ 74% of patients who experienced renal trauma were male, and 74% were aged younger than 40 years.

In an epidemiologic study of 57,367 trauma patients over 1 year, 284 (0.5%) had genitourinary injuries.⁴ Ninety-two percent of patients were male (mean age, 25 years). The most common injuries were to the kidney and scrotum (33% and 32%, respectively) followed by the testis (7%), urethra (6%), and bladder (3%). Associated injuries were common, with 40% of patients having extremity injury; 22% had intra-abdominal injury, and 18%, 13%, and 7% had injuries to the chest, vertebrae, and head and neck, respectively. The mortality rate in these patients was 4.2%.

In a report from the Croatian war (1991–1993), 588 of 24,865 hospitalized patients suffered 629 urogenital injuries (2.4%).⁵ The majority of the injuries were due to shells and mines (66%), 26% were from bullets, and 8% were blunt injuries. Of these patients, 76% had injuries to other organs. The distribution of injuries was: kidney, 40%; genitals, 30%; bladder, 17%; ureter, 8%; and urethra, 5%. In a study of 35 patients who experienced urogenital injury during the Gulf War (1991), 12 (34%) had injuries to the kidney, 2 to the ureter, 4 to the bladder, 7 to the penis/urethra, and 10 to the testis or scrotum.⁶ Over half of these injuries were from gunshots. Eighty-one percent of these patients had associated penetrating wounds of the abdomen requiring laparotomy, while 31% had associated chest injuries and 31% had lower limb injuries. The distribution of these injuries was similar to those of the Vietnam War, where 35% of injuries were to the upper urogenital tract and 65% to the lower urogenital tract.⁷

EVALUATION OF RENAL INJURY

CASE 1 PRESENTATION

A 27-year-old construction worker falls from a height of approximately 10 ft and is transported by ambulance to a local hospital. He complains of pain in the right flank area and in his right lower leg. He never