

Therapeutic Urogenital Modalities during the Last Three Years of the Iran and Iraq War (1985–1987)

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Objective: Research projects in the field of military medicine have a central role in medical logistical planning. Treatment of traumatic lesions (including urogenital system injuries) is an important aspect of military medicine. Triage for urogenital injuries has specific problems and points of concern. The purpose of this study was to evaluate the role and different types of therapeutic modalities in the treatment of urogenital injuries during the final 3 years of the Iran and Iraq War (1985–1987). **Methods:** In a descriptive-analytical study, records of 1,094 patients with urogenital injuries hospitalized from 1985 to 1987 were studied. A checklist and the Statistical Program for the Social Sciences (version 6) were used for data collection and analysis, respectively. A χ^2 test interpreted part of the data. **Results:** The highest incidence of urogenital injuries and the highest rate of surgical interventions for urogenital injuries were in 1986 and 1987, respectively. The total incidence of urogenital injuries was 0.51%. Among all surgical interventions, bladder repair was most frequent and ureteral repair was least frequent. Partial nephrectomy was the second most frequent surgical intervention and was performed more often than total nephrectomy. There was a significant difference between the urogenital surgery rate and the total surgery rate ($\chi^2 = 148, p = 0.000$). **Conclusion:** The results suggest progress in the triage of patients with urogenital injuries. The lower incidence of urogenital injuries, however, should be interpreted cautiously because it may be attributable to different combat field conditions. Follow-up studies in this group of patients are necessary.

Introduction

One of the most basic principles in logistical planning programs (whether medical or nonmedical) is the need for precise information about the number and mode of casualties; this allows an appropriate estimate of the needed equipment and personnel during military operations.¹ Traumatic injuries are an important source of casualties, and of the different types of war injuries, urogenital lesions are among the most complex, severe, and life-threatening.² Although they have a relatively low incidence during military operations (usually between 2 and 5% of all injuries³), urogenital lesions are often associated with other lesions in different areas of the body.²

Urogenital injuries are more frequent in patients with multiple injuries. Multiple injuries are more common during wartime,⁴ and urogenital lesions contribute to the higher risk of

morbidity and mortality among such patients.⁵ Open wounds, inadequate therapeutic facilities, transportation problems, lack of skilled health personnel, inappropriate therapeutic protocols, and other problems all increase mortality and morbidity rates of these lesions.^{4,5} One of the characteristics of urogenital injuries that should be stressed is the severity of the lesions. In a study performed on 8,000 patients with combat-related urogenital injuries, 78% of the lesions were mild, 17% were moderate, and 5% were critical.⁴ In a similar study of more than 4,000 Iranian patients with combat-related urogenital injuries in the Iran and Iraq War, 1,000 patients received ambulatory treatment, 3,000 patients were admitted to hospitals for 1 to 2 weeks, 500 patients needed more than 2 weeks of hospitalization (because of the severity of their injuries), and 50 patients died.⁶

Because of the morbidity and mortality associated with urogenital injuries and the inadequacy of research in the field of military medicine,⁷ and because of the difficulty of surgical treatment under battle conditions (as demonstrated in Lebanon, Vietnam, and the Persian Gulf⁸), it seems necessary to assess these injuries and their therapeutic modalities during wartime and in different situations.

During the Iran and Iraq War, the Iranian medical section improved its care of patients with these injuries. The role of field hospitals in performing the most cost-effective interventions cannot be ignored.⁹ This study was designed to assess the incidence of different surgical modes of intervention for urogenital injuries on the Iranian front during the last 3 years of the Iran and Iraq War. The ultimate goals of this research are improved design of logistical facilities and planning for health personnel in different specialties and a clearer picture of the casualties for follow-up planning.

Materials and Methods

In a cross-sectional, descriptive-analytical study performed during the spring and summer months of 1996 (a 6-month period), the records of patients with urogenital injuries who were injured on the Iranian front from March 21, 1985, to March 21, 1987, were studied. There were 1,094 patients; in none of the previous studies has so many patients been studied.² The unique number of cases suggested a census method for the study to reduce the likelihood of errors. The records of the patients were uniform, which made their information more available and effective. A checklist was prepared based on previous studies^{1,2,4,6,8} and a preliminary survey of the records. To analyze part of the results, a χ^2 test was used ($p < 0.05$ was determined to be significant).

Results

Among a total of 1,094 patients during a 3-year period, the highest rate of injury was in 1986 (575 cases, 52.55%). Also, the

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TABLE I
TOTAL NUMBER AND PERCENTAGE OF UROGENITAL SURGICAL INTERVENTIONS DURING A 3-YEAR PERIOD, AND NUMBER OF INTERVENTIONS BY YEAR

Year	Surgical Procedure							
	Bladder Repair	Partial Nephrectomy	Nephrostomy	Cystostomy	Total Nephrectomy	Urethral Repair	Ureteral Repair	Exploration
1985	23	17	11	21	8	3	7	11
1986	53	43	27	11	18	24	13	48
1987	41	51	29	23	24	7	9	17
Total	117 (21%)	111 (20%)	64 (11.5%)	55 (10%)	50 (9%)	34 (6.1%)	29 (5.2%)	76 (13.7%)

greatest number of surgical interventions was in the same year (373 operations, 64.75% of all operations during the study period).

Among the 1,094 patients studied, 541 underwent surgery (49.45%). The eight most common surgical interventions were determined, and bladder repair was the most common during the 3-year study period (117 operations, 12% of all operations).

The least common of the eight methods of surgical intervention was ureteral repair (29 operations, 5.2%). Total nephrectomy was performed on 50 patients in the 3-year period (9% of all interventions); partial nephrectomy was performed on 111 patients during the same period (20% of all interventions), making it the second most common procedure used (Table I). All surgical drainage procedures in cases of obstructions are referred to as cystostomy (including placement of suprapubic catheters). If no definite cause of hemorrhage or injury was determined, exploratory laparotomy was the method of choice; this was referred to in the checklist as "exploration."

According to the Southern Command District of Sepah Forces, during these 3 years 212,595 troops were injured (54,653, 133,042, and 24,900 in 1985, 1986, and 1987, respectively). Of these, 1,094 (0.51%) sustained urogenital injuries. Among the patients with urogenital injuries, 541 (49.45% of all urogenital patients, 2.13% of all casualties) underwent surgery.

There was a significant difference between the incidence of operations for urogenital injuries and the incidence of all surgical operations in the total population of injured persons ($\chi^2 = 148, p = 0.000$).

Discussion

The highest incidence rate for urogenital injuries was in 1986, which could be attributable to the occurrence of a major ground attack in that year. In 1987, urogenital operations had a higher rate, which could suggest progress in this field. Of course, the total number of operations had increased in 1986 (over the previous year). The significant difference between urogenital system operations and total operations, and also the improved trend, were probably the result of the high capacity of urogenital operating rooms.

Bladder repair was the most common procedure. In another study, this procedure was the second most common procedure and kidney repair was the most common procedure⁶; that study was also performed in the same war. However, regarding the results of this and other studies,^{2,5,6} it can be suggested that in the field of military medicine, bladder injuries (and, conse-

quently, their treatment procedures) are among the most frequently encountered urogenital challenges. Because of the nature of bladder injuries, follow-up interventions are mandatory in this group of patients.¹⁰

The least commonly performed operations were ureter and urethra repair; these results are similar to those of other studies.^{2,5,6} In a previous study, one-fifth of all ureteral injuries were unrecognized and a second operation was necessary.^{2,11} Also, urethra injuries have specific complications and follow-up remedies.¹²⁻¹⁴ In the early years of the Iran and Iraq War, total nephrectomy was a commonly performed intervention,¹⁵ but later in the war, there was a tendency to perform partial nephrectomy for renal injuries and to preserve the kidney tissue as much as possible. Total nephrectomy in the later war years was performed only after failure of the partial procedure, and the results of this study show a decreasing incidence of total nephrectomy during the last years of the war.

Total nephrectomy should be restricted to the most severe lesions and should be performed only after complete X-ray studies.¹⁵ If it is necessary, it should be performed only after palpation of the other kidney, to confirm the presence of at least one kidney.²

In this study, the total incidence of urogenital injuries was estimated to be 0.51% of all combat injuries. This rate should be interpreted with caution.²

Regarding the nature of the urogenital lesions, the authors advise a full list of follow-up studies for this group of patients to enable us to recognize their specific problems and the most appropriate modes of rehabilitation.^{2,13,14}

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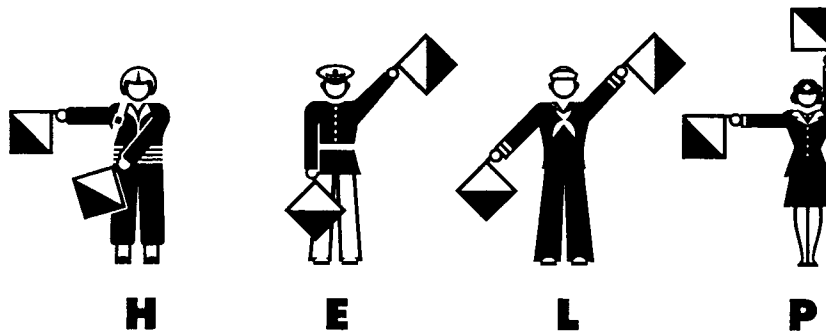
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