Bladder Stones in Afghan Children

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ABSTRACT Objectives: Military surgeons have been providing humanitarian care in Afghanistan since 2002. There are scant published reports on the details of that care. We report here the experience of deployed U.S. Army general surgeons in the management of an endemic problem, bladder stones in Afghan children. Methods: A retrospective review was performed of pediatric patients presenting to an International Security Assistance Force humanitarian clinic over a 12-month period from October 2010 to November 2011. Symptoms at presentation, diagnostic modalities, and treatment provided were analyzed. The general surgeons of the 126th Forward Surgical Team (FST) provided surgical consultations for this military humanitarian clinic on a remote base in western Afghanistan. Results: Eight male pediatric patients of an average age of 4 years presented with dysuria and underwent further evaluation. In five patients, the use of a portable ultrasound machine led to the diagnosis of bladder stones. Three other patients presented with ultrasound exams from an Afghan clinic. Four patients underwent surgical removal of their bladder stones by the FST and 4 four patients, including one with a recurrent bladder stone, were referred to a distant Afghan Regional Hospital. No short-term complications occurred in the five patients available for follow-up. Conclusions: Military surgeons providing humanitarian care in rural areas of Afghanistan, and humanitarian surgeons serving in endemic areas, can expect to encounter multiple cases of bladder stones in pediatric patients. Dysuria is a typical presenting symptom. The FST has the resources to diagnose and treat this disorder. If accessible, Afghan regional hospitals can provide curative surgery.

INTRODUCTION

Military surgeons from the United States and other NATO nations have been providing humanitarian care in Afghanistan since the beginning of the war in 2002. Unfortunately, there have been scant published reports concerning the common diagnoses and treatment rendered to Afghan civilians in humanitarian clinics.

As is common in humanitarian missions, children comprise a large portion of the patient population in Afghanistan. Bladder stones in pediatric patients are an unfamiliar condition for Western-trained surgeons but a common diagnosis in developing nations such as Afghanistan. We report here the experience of U.S. Army general surgeons in the management of bladder stones in Afghan children.

METHODS

A retrospective review was performed of pediatric patients presenting to an International Security Assistance Force (ISAF) humanitarian clinic over a 12-month period from October 2010 to November 2011. Symptoms at presentation, diagnostic modalities, and treatment provided were analyzed. The general surgeons of the 126th Forward Surgical Team (FST) provided surgical consultations for this military humanitarian clinic on a remote base in western Afghanistan.

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RESULTS

Approximately 380 Afghan pediatric patients, including patients presenting with a complaint of dysuria, were evaluated during that time. Eight male pediatric patients with an average age of 4 years presented with a complaint of pain with urination or hematuria and underwent further evaluation. In five patients, the use of our portable ultrasound machine, usually utilized for the Focused Abdominal Sonography for Trauma exam, led to the diagnosis of bladder stones. Three other patients presented with ultrasound exams from an Afghan clinic. Four patients underwent surgical removal of their bladder stones by the FST and four patients, including one with a recurrent bladder stone, were referred to a distant Afghan Regional Hospital. No short-term complications occurred in the five patients available for follow-up.

DISCUSSION

Over a 12-month period, four general surgeons assigned to FST in a remote area of western Afghanistan evaluated Afghan civilian patients who presented to a humanitarian ISAF humanitarian clinic. Approximately 1000 surgical patients were evaluated. 38% were children and about 2% were female.

The oldest bladder stone found by archaeologists' dates back to 4800 BC in Egypt.[1] Currently, bladder calculi are an uncommon cause of pediatric illness in Western nations. Bladder calculi remain common in less developed countries such as Thailand, Burma, Indonesia, the Middle East, and North Africa.[2] In the only report of pediatric bladder stones from Afghanistan in 1984, the authors described 132 cases of pediatric bladder stones evaluated over a 1-year period at a provincial hospital, with cystolithotomy accounting for 20% of pediatric surgical procedures.[3]

The etiology of stone formation appears to be multifactorial. Boys under 11 to 12 years of age are affected much more commonly than girls. There is a known cultural bias in Afghanistan against female patients being evaluated by male health care workers. This was demonstrated by the fact that 98% of the patients evaluated in our ISAF clinic were male and all of our bladder stone patients were male. Despite that finding, male gender does truly seem to be a risk factor. Our review of the literature found a male predominance of 77 to 100%.[3–6]

There appears to be no association of bladder stones with renal calculi.[7] Pediatric bladder stone composition includes ammonium acid urate and calcium oxalate.[8,9] Diet seems to be a significant contributing factor to bladder stone formation in endemic areas. General malnutrition and a poorly balanced diet deficient in protein, vitamins, and phosphates are known to favor child lithogenesis. Tea, nuts, and green leafy vegetables contribute to the high oxalate load. Other possible factors include intake of breast milk, early consumption of polished rice, and late introduction of meat and fish to the diet. Dehydration related to diarrheal disease, and its associated concentrated acidic urine, may also be an etiological factor.[4,5,10,11]

Most bladder calculi in children measure 1 to 3 cm in diameter, but stones as large as 10 cm have been reported.[6] Lower socioeconomic status in endemic areas confers a higher risk of stone formation.

The most common symptom of pediatric bladder stones in endemic areas is dysuria, but other symptoms can include acute urinary retention, priapism, occasional enuresis, and general malnutrition.[3,5,7,12] In our patients, the two most common symptoms reported by the parents were pain with urination and blood visualized in the urine.

Diagnosis of bladder stones in a symptomatic patient can be made with ultrasound. We found that the portable ultrasound machine utilized by the FST for Focused Abdominal Sonography for Trauma exams was adequate for this purpose (Fig. 1). We utilized plain radiography in one patient for confirmation of the diagnosis of a large recurrent stone (Figs. 2 and 3). We observed that the Afghan parents seemed to be very aware of the diagnosis and commonly would report to us that they suspected bladder stones.

The impact of pediatric bladder stones in developing countries has been significant. In a recent study from Thailand, bladder stone removal accounted for 55% of all surgical procedures performed on children at a provincial hospital.[5] Left untreated, bladder stones can result in recurrent bacterial urinary tract infection, chronic pain, and urinary retention because of bladder outlet obstruction.[13]

FIGURE 1. Portable ultrasound demonstrating a large bladder stone in 6-year-old boy.

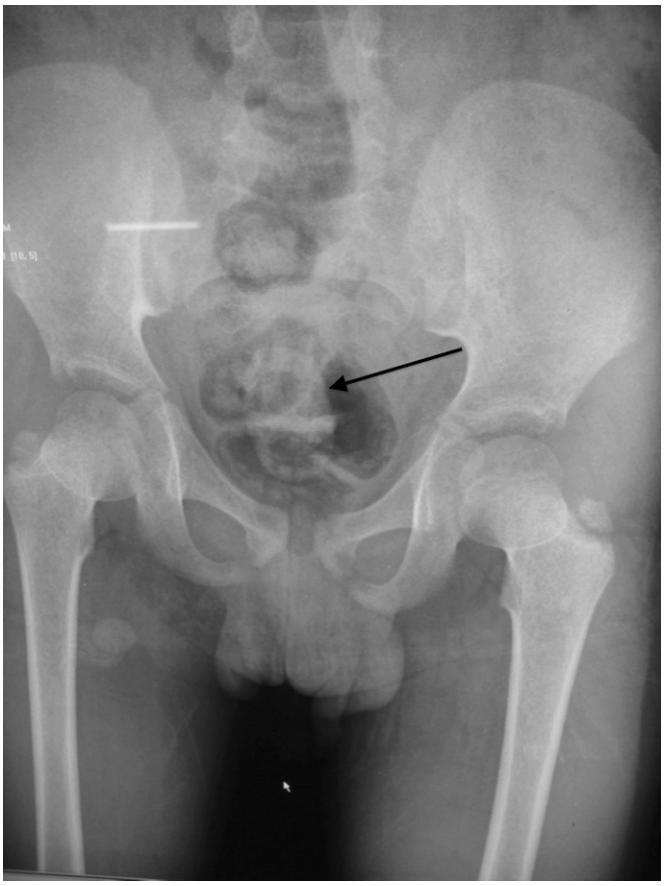

FIGURE 2. Plain abdominal radiograph demonstrating a large recurrent bladder stone (arrow) in 6-year-old boy.

FIGURE 3. Bladder stone being held by the father of a patient.

Accounts of humanitarian care provided in Afghanistan and Iraq are scant. Becker et al[14] suggested that routine surgical humanitarian care might be detrimental to both the military mission and the host nation medical system. Lesho et al[15] described outreach military humanitarian teams as providing "tailgate medicine," which may have a negative impact on the local population and indigenous health care system. The only detailed account of humanitarian care provided in Afghanistan that our research identified is a report by Burnett et al that described their experience with pediatric care at a Combat Support Hospital.[16]

Surgeons wishing to provide humanitarian care are commonly put at odds with their Commanders. Our leadership understandably had great concern regarding the utilization of supplies since our remote forward operating base was difficult to resupply. Our FST commonly referred patients out because of concerns about resource utilization. Only one anesthesia provider was assigned to our FST and our facility (tent) contained only one operating room table. In addition, some anesthesia drugs were at times in short supply. Theoretically, care of a military casualty could be delayed or compromised if brought to our FST while we were conducting elective surgery on a medical rules of engagement negative civilian patient. Postoperatively there was minimal resource utilization since the patients were discharged on the day of surgery with a Foley catheter in place and seen 5 days post-op for catheter removal.

This report has many limitations. Our ISAF humanitarian clinic operated out of a tent and offered extremely limited diagnostic evaluations. In addition, we worked in conjunction with Italian NATO primary care physicians and interpersonal communication was challenging. Therefore, we may have been unaware of additional children with urinary symptoms evaluated and treated by our NATO colleagues.

In summary, improvement of social and nutritional conditions probably accounts for the near disappearance of childhood bladder stones from affluent countries. Pediatric bladder stones are endemic in many developing countries, including Afghanistan. Military surgeons in Afghanistan, and physicians providing humanitarian care in endemic areas, will likely encounter such patients. The most common presenting symptom is dysuria in boys younger than 12 years. An FST has the resources to provide diagnosis and treatment. Recognizing that there are financial and security barriers to patient travel in Afghanistan, provincial hospitals do have the capability to perform curative surgery.

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