UROGENITAL TRAUMA

Cystogram Follow-Up in the Management of Traumatic Bladder Disruption

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Background: The utility of obtaining a routine cystogram after the repair of intraperitoneal bladder disruption before urethral catheter removal is unknown. This study was designed to examine whether follow-up cystogram evaluation after traumatic bladder disruption affected the clinical management of these injuries. We hypothesized that routine cystograms, after operative repair of intraperitoneal bladder disruptions, provide no clinically useful information and may be eliminated in the management of these injuries.
Methods: Our prospectively collected trauma database was retrospectively reviewed for all ICD-9 867.0 and 867.1 coded bladder injuries over a 6-year period ending in June 2004. Demographics, clinical injury data, detailed operative records, and imaging studies were reviewed for each patient. Bladder injuries were categorized as intraperitoneal (IP) or extraperitoneal (EP) bladder disruptions based on imaging results and operative exploration. Patients with IP injuries were further subdivided into those with "simple" dome disruptions or through-and-through penetrating injuries and "complex" injuries involving the trigone or ureter reimplantation. All patients sustaining isolated ureteric or urethral injury were excluded from further analysis.
Results: In all, 20,647 trauma patients were screened for bladder injury. Out of this group, there were 50 IP (47 simple, 3 complex) and 37 EP injuries available for analysis. All IP injuries underwent operative repair. Eight of the IP injuries (all simple) had no postoperative cystogram and all were doing well at 1- to 4-week follow-up. The remaining 42 patients underwent a postoperative cystogram at 15.3 +/- 7.3 days (range 7 to 36 days). All simple IP injuries had a negative postoperative cystogram. The only positive study was in one of the three complex IP injuries. In the EP group, 21.6% had positive cystograms requiring further follow-up and intervention.
Conclusions: Patients sustaining extraperitoneal and complex intraperitoneal bladder disruptions require routine cystogram follow-up. In those patients undergoing repair of a simple intraperitoneal bladder disruption, however, routine follow-up cystograms did not affect clinical management. Further prospective evaluation to determine the optimal timing of catheter removal in this patient population is warranted.

Editorial Comment

When it comes to diagnosing bladder injuries, in the vast majority, the presenting sign is gross hematuria and pelvic fracture (1). For penetrating bladder injuries, up to 50% will only have microscopic hematuria. Accurate methods for diagnosing and staging the bladder injury are a formal cystogram with retrograde filling until at least 300 mL or bladder spasm, as well as a post-drainage film to look for another potential 10-15% of injuries, hidden behind the contrast on filling. Computed tomography (CT) cystogram is also very accurate for bladder injury, and has the advantage that it can be performed at the same time as the abdominal and pelvic imaging CT. The key is that clamping the Foley often produces inadequate bladder distention for injury diagnosis. Retrograde filling is required in order to avoid missed injuries.

This article nicely illustrates the management and evaluation methods for intraperitoneal (IP) and extraperitoneal (EP) bladder injuries. Inaba et al. divide IP bladder injuries into simple (bladder dome and wall) and complex (involve the trigone and ureteral orifice). Of 39 simple IP bladder injuries closed at the time of celiotomy, 100% were healed by 15 days. They thus effectively argue that after 2 weeks of Foley catheter rest, a cystogram is not required before Foley removal. In contrast, complex bladder injuries (which involve the trigone or ureter) typically also have significant blast injury and require prolonged Foley drainage and thus

cystography to confirm healing. For EP bladder injuries, only 10-15% of pelvic fractures have an associated bladder injury, while over 90% of bladder injuries have a pelvic fracture. Inaba et al. show that 88% of EP bladder injuries heal with Foley catheter alone, by 16 days and the remaining 12% by 47 days. This is consistent with prior reports that most EP injuries heal within 2 weeks and the remaining by 4 to 6 weeks. The only EP bladder injury cases that I have seen that not heal with bladder rest were due to bony pelvic spicules penetrating the bladder, and thus required open surgical repair. Such cases are very rare.

Reference

1. Morey AF, Iverson AJ, Swan A, Harmon WJ, Spore SS, Brandes SB: Bladder rupture after blunt trauma: guidelines for diagnostic imaging. J Trauma. 2001; 51: 683-6.

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Does Nephrectomy for Trauma Increase the Risk of Renal Failure?

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Renal failure is a feared complication following operations for severe trauma. Injuries to the kidney may be managed by nephrectomy or nephrorrhaphy. Nephrectomy may increase the risk of renal failure in already at-risk trauma patients. Nephrectomy for trauma should be avoided to the extent possible because it is associated with renal failure. From a prospectively collected trauma database, 59 patients with nephrectomy were matched at 1:1 ratio with 59 patients with nephrorrhaphy. Matching criteria were age (+/- 5 years), Injury Severity Score (+/- 3), abdominal Abbreviated Injury Score (+/- 1), and mechanism of injury (blunt or penetrating). The rates of renal function compromise (defined as a serum creatinine level >2 mg/dl for more than 2 days) and renal replacement therapy (continuous or intermittent) were compared in the two groups. The two groups were well-matched and similar with regard to injury severity and organs injured. Between nephrectomy and nephrorrhaphy patients, there were no differences in renal function compromise (10% vs. 14%, $p = 0.57$), renal replacement therapy (5% vs. 0%, $p = 0.12$), length of hospital stay (19 +/- 26 vs. 20 +/- 21, $p = 0.8$), and mortality (15% vs. 12%, $p = 0.59$). Salvaging the injured kidney does not seem to offer an obvious clinical benefit regarding postoperative renal function. Given the increased operative complexity of nephrorrhaphy in comparison to nephrectomy and the frequent need to abbreviate the operation in patients with severe trauma, nephrectomy should not be avoided when appropriate.

Editorial Comment

Contemporary trauma management employs a damage control principle. Patients who become cold, coagulopathic, and acidotic have a very high mortality rate. In order to avoid this fatal triad, it was observed that if the trauma patient underwent an abbreviated operation to control bleeding and fecal soiling, followed by ICU resuscitation, then followed by a staged definitive repair, the patient survival rates were dramatically improved. Currently, abbreviated surgeries and staged definitive repair are standard of trauma care and have

been applied to all organ system, including genitourinary. Although as urologists, we are in the kidney preservation business, the overall survival of the patient should not be compromised in order to save the kidney. In other words, do not kill the patient trying to save the kidney. In trauma circles, the way to damage control injures organs is to quickly control bleeding and fecal and urinary soiling. To control bleeding the organ can be packed, quickly repaired or removed. To control urinary spillage, the ureter can be exteriorized, ligated or quickly repaired. The use of damage control to urology was popularized (1). To the trauma surgeons, since most trauma patients are young healthy adults with 2 normal kidneys and a normal creatinine, the kidney can be removed without too much overall kidney function compromise. Velmahos et al., puts up a good argument in the above article, but I would argue a different conclusion. The authors are trying to support the high 50-60% nephrectomy rates of yester-year. I would argue that the nephrectomy rate does not have to be higher the 20% and we can still follow a damage control method. Furthermore, palpating for a normal feeling contralateral kidney can be unreliable. I have personally seen 2 cases of trauma patients with a nonfunctioning contralateral multi-cystic dysplastic kidney and one hypertrophied psoas muscle that was thought to be palpably normal kidney by the trauma service. In the stable blunt trauma patient, all grade 1-4 renal injuries should managed conservatively if possible. In the blunt trauma patient who is explored, a stable, nonpulsatile, nonexpanding, contained perinephric hematoma should be left alone. In the penetrating trauma patient who is explored and the kidney does not have much blast injury and not really bleeding, I would just cover the gunshot holes with a surgi-cell and place a drain. The kidney can also be packed. Once resuscitated on a staged celiotomy, the kidney can be reexamined and a more definitive repair can be performed.

Reference

1. Brandes SB: Damage control for urologic trauma: an approach for improved survival. J Urol. 2003; 169: 69A.

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PATHOLOGY

Update on the Gleason Grading System for Prostate Cancer: Results of an International Consensus Conference of Urologic Pathologists

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The Gleason system for prostate cancer was based on a study of 270 patients from the Minneapolis Veterans Administration Hospital in 1966-1967. In 1974, Gleason and the Veterans Administrative Cooperative Urological Research Group expanded this study to 1032 men. These studies formed the basis of the Gleason grading system, which is now endorsed as the primary grading system for prostate cancer by the World Health Organization, the Armed Forces Institute of Pathology Fascicle on prostate cancer, the Association of Directors of Anatomic and Surgical Pathology, and the College of American Pathologists. In the nearly 40 years since its