Editorial Comment

Multidetector CT-urography (MDCT-urography) has been shown to be an effective single comprehensive examination in the evaluation of patients with hematuria or with risk for the development of urothelial malignancies. Since protocols for MDCT urography varies from each institution, most MDCT urography images are obtained in the unenhanced phase (detection of calculi), nephrographic-phase (detection of renal masses) and excretory-phase (detection of urothelial lesions). The authors present their results with a new protocol called split-bolus MDCT urography where the unenhanced phase is followed only by a combined nephrographic and excretory phase. During split-bolus, CT-urography the intravenous injection of contrast material is performed in two steps. First, 40 ml is injected at 2 ml/s and after 120 second from the beginning of the first injection, the remaining 80 ml is injected. This technique showed high sensitivity and specificity, for the detection of all proven cases of tumors of the upper urinary tract. The main objective with MDCT-urography is to detect all possible causes of hematuria while using the lowest possible radiation dose to the patient. As shown by the authors the split-bolus technique has the potential to reduce both radiation dose and the number of images generated by MDCT urography. In our opinion this protocol is ideal for patients submitted to previous cystoscopy since we might miss some small tumors within a fully distended and opacified bladder .As we have discussed previously in this journal (volume 33, number 3, pages 435-436), we consider "the bladder-wall phase" (scans at 60 or 70 seconds after intravenous injection of the total amount of contrast), essential for the detection of small bladder tumors. However, this "bladder phase wall" has the drawback of significant increase in the effective radiation dose to the patient (18 to 25 mGy).

Dr. Adilson Prando
Chief, Department of Radiology and
Diagnostic Imaging
Vera Cruz Hospital
Campinas, São Paulo, Brazil

UROGENITAL TRAUMA

Selective nonoperative management of penetrating abdominal solid organ injuries

Demetriades D, Hadjizacharia P, Constantinou C, Brown C, Inaba K, Rhee P, Salim A
Division of Trauma and Surgical Intensive Care, Department of Surgery, USC School of Medicine, Los Angeles, CA, USA
Ann Surg. 2006; 244: 620-8

Objective: To assess the feasibility and safety of selective nonoperative management in penetrating abdominal solid organ injuries.
Background: Nonoperative management of blunt abdominal solid organ injuries has become the standard of care. However, routine surgical exploration remains the standard practice for all penetrating solid organ injuries. The present study examines the role of nonoperative management in selected patients with penetrating injuries to abdominal solid organs.
Patients and Methods: Prospective, protocol-driven study, which included all penetrating abdominal solid organ (liver, spleen, kidney) injuries admitted to a level I trauma center, over a 20-month period. Patients with hemodynamic instability, peritonitis, or an unevaluable abdomen underwent an immediate laparotomy. Patients

who were hemodynamically stable and had no signs of peritonitis were selected for further CT scan evaluation. In the absence of CT scan findings suggestive of hollow viscus injury, the patients were observed with serial clinical examinations, hemoglobin levels, and white cell counts. Patients with left thoracoabdominal injuries underwent elective laparoscopy to rule out diaphragmatic injury. Outcome parameters included survival, complications, need for delayed laparotomy in observed patients, and length of hospital stay.
Results: During the study period, there were 152 patients with 185 penetrating solid organ injuries. Gunshot wounds accounted for 70.4% and stab wounds for 29.6% of injuries. Ninety-one patients (59.9%) met the criteria for immediate operation. The remaining 61 (40.1%) patients were selected for CT scan evaluation. Forty-three patients (28.3% of all patients) with 47 solid organ injuries who had no CT scan findings suspicious of hollow viscus injury were selected for clinical observation and additional laparoscopy in 2. Four patients with a "blush" on CT scan underwent angiographic embolization of the liver. Overall, 41 patients (27.0%), including 18 cases with grade III to V injuries, were successfully managed without a laparotomy and without any abdominal complication. Overall, 28.4% of all liver, 14.9% of kidney, and 3.5% of splenic injuries were successfully managed nonoperatively. Patients with isolated solid organ injuries treated nonoperatively had a significantly shorter hospital stay than patients treated operatively, even though the former group had more severe injuries. In 3 patients with failed nonoperative management and delayed laparotomy, there were no complications.
Conclusions: In the appropriate environment, selective nonoperative management of penetrating abdominal solid organ injuries has a high success rate and a low complication rate.

Editorial Comment

Most blunt solid organ injuries can successfully be managed nonoperatively. Stab wounds, in general can be managed nonoperatively about 50% of the time for anterior abdominal entrance wounds and 85% for retroperitoneal entrance. While traditionally teaching dictates that gunshot wounds of the abdomen were absolute indications for exploration, such concepts have been brought into question with multiple publications in the last few years, mostly championed by the trauma group from LA County Medical Center. In general the treatment algorithm for penetrating abdominal trauma is as follows: signs or symptoms of peritonitis, hemodynamic instability or an abdomen difficult to evaluate due to mental status change or body habitus, underwent intra-abdominal exploration. All other patients were imaged by CT with intravenous contrast. If the CT suggested a hollow organ viscus injury or a contrast "blush" with instability, the patient was explored. Contrast "bush" and stable patients underwent angiography. If there was no bowel injury and the penetrating wound was on the left and thoracoabdominal, a delayed diagnostic laparoscopy is performed to evaluate for a diaphragmatic injury. Any injury was repaired laparoscopically. The patient is then examined serially for the next 24 to 48 hours. Persistently asymptomatic patients were fed and discharged after 48 hours. 60% of penetrating injuries were explored immediately, 30% (27) of whom had with kidney injuries. Of the injured kidneys, 12 underwent renorrhaphy and 9 or (33%) nephrectomy. Of those kidney injuries managed conservatively, none of the Grade 1 and 2 injuries were explored while 1 of 3 of the Grade 3-5 injuries were explored. In conclusion, in the very select patient gunshot wound to the kidney patient, nonoperative management can be successful.

Dr. Steven B. Brandes
Associate Professor, Division of Urologic Surgery
Washington University in St. Louis
St. Louis, Missouri,USA

Proposed mechanisms of lower urinary tract injury in fractures of the pelvic ring

Andrich DE, Day AC, Mundy AR
Institute of Urology, UCL, London, UK
BJU Int. 2007; 100: 567-73

Objective: To investigate whether the observation of particular pelvic fracture patterns enables the clinician to predict the presence and type of injuries to the lower urinary tract, as the mechanisms of injury to the lower urinary tract in association with fractures of the pelvic ring are unclear.
Patients and Methods: The case-notes and radiographs of 168 patients with either pelvic ring or acetabular fractures were reviewed; 108 pelvic ring fractures (81 men, 27 women) and 60 acetabular fractures (46 men, 14 women). The pelvic fractures were classified according to the system described by Tile and were correlated with the incidence and type of lower urinary tract injury (LUTI).
Results: Overall, of the 108 men and women with pelvic ring fractures, 27 (25%) had a LUTI documented either radiologically or as an intraoperative finding. Of the 81 men with pelvic ring fractures, 24 (30%) had a LUTI, of whom six (7%) had an isolated bladder laceration, 14 (17%) a partial urethral injury (PUI) and four (5%) a complete urethral disruption (CUD). Five of the 18 men with urethral injuries also had bladder injuries and in three of these, the bladder neck was also injured. Three of 27 women (11%) had a LUTI, all of whom had isolated bladder lacerations. Of the 46 men with an acetabular fracture, one (2%) had a CUD, and three (7%) had a PUI. One of 14 of women with an acetabular fracture sustained a bladder laceration. None of the three men with a Tile Type-A pelvic ring fracture sustained a LUTI. Of the 28 men with 'open-book' (Tile Type-B1) fractures, 21 (75%) had no associated LUTI and seven (25%) had a LUTI (five partial urethral injuries and two bladder lacerations). Of the 10 men with 'lateral compression' (Tile Type-B2) fractures, six had no LUTI and four had a LUTI (two partial urethral injuries and two bladder lacerations). Of the 40 men with 'vertical shear' (Tile Type-C) fractures, 27 (68%) had no LUTI and 13 (32%) a LUTI (four complete urethral disruptions, seven partial urethral injuries, and two bladder lacerations) including all of the combined bladder and urethral injuries and all of the bladder neck injuries.
Conclusion: The pelvic fracture pattern alone does not predict the presence of a LUTI. When it occurs, the type of LUTI appears to be related to the fracture mechanism. The pattern of injury to the soft tissue envelope and specifically to the ligaments supporting the lower urinary tract offers the best correlation with the observed LUTI. We propose a mechanism for this.

Editorial Comment

The above article by Mundy clearly deserves a closer look, particularly at the illustrative images and figures. Pelvic fractures are typically classified by fracture pattern and mechanism of injury. The two most commonly used schemas are the Young-Burgess and the Tile classifications. They divide the fracture patterns more by mechanism into Type A, anterior compression (AP) injury, Type B, lateral compression (LC) and Type C vertical shear and conformationally unstable. Bladder injuries in the male with pelvic fractures are primarily due to shearing forces and not to bladder penetration from a bony spicule. This is illustrated by publications from the SF General Group where half of bladder injuries occurred on the opposite side of the bony fracture. Intuitively, a pelvic fracture that results in the most shearing forces, then should also give the highest likelihood for bladder injury. Urethral injuries have been classically described by Turner Warwick as prostato-membranous disruption injuries. It is my observation, and that of others, most injuries to the urethra from pelvic fracture are at the bulbomembranous junction and not at the level of the prostate. Again, in the male, it appears that shearing forces are the cause of urethral injury and not direct compression or penetration. In other words, the injury that causes the most shearing forces to the urethra should cause an injury.

Dr. Steven B. Brandes
Associate Professor, Division of Urologic Surgery
Washington University in St. Louis
St. Louis, Missouri, USA

PATHOLOGY

The role of P501S and PSA in the diagnosis of metastatic adenocarcinoma of the prostate

Sheridan T, Herawi M, Epstein JI, Illei PB
Department of Pathology, The Johns Hopkins Hospital, Baltimore, MD, USA
Am J Surg Pathol. 2007; 31: 1351-5

Background: Adenocarcinoma of the prostate can present as metastatic carcinoma with no known primary. Prostatic origin can be confirmed in most of these cases by immunohistochemistry for prostate-specific antigen (PSA) and prostate-specific acid phosphatase. In a small subset of high-grade prostate carcinomas, both markers are negative and therefore are not helpful for confirming prostatic origin. Recently, novel marker proteins that are preferentially expressed in prostate tissue were identified. One such marker is P501S or prostein, a 553-amino acid protein that is localized to the Golgi complex. It is expressed in both benign and neoplastic prostate tissues, but not in any other normal or malignant tissue examined to date. Owing to its apparent specificity, prostein may be a good marker to demonstrate prostatic origin in metastatic prostate cancer.
Design: Five-micron sections of a tissue microarray were subjected to immunohistochemistry with a monoclonal mouse anti-P501S (clone 10E3, Dako, Carpintera, CA) antibody and a monoclonal mouse anti-PSA (clone ER-PR8, Dako, Carpintera, CA) antibody. The tissue microarray contains 78 cases of metastatic prostatic adenocarcinoma, 20 cases of primary prostatic adenocarcinoma, and 20 cases of benign prostate tissue from the peripheral zone as well as samples of benign brain, pancreas, kidney, thyroid, testis, skeletal muscle, and fibroconnective tissue.
Results: Similar staining (intensity and extent) was identified for both markers in the majority of metastatic tumors (11 distant sites, 42 pelvic lymph nodes), in all 20 primary tumors and in all benign prostate and nonprostate tissues. The P501S stain had perinuclear cytoplasmic (Golgi) distribution even in poorly differentiated tumors and metastases. Two distant metastases were negative for PSA but retained focal weak positivity for P501S. Two other distant metastases were weakly PSA positive, but strongly P501S positive. Metastases in the pelvic lymph nodes were positive for both markers in 53 cases and 1 lymph node metastasis was strongly PSA positive but P501S negative. In summary, 67 of the 69 cases (97%) of metastatic prostate carcinomas were PSA positive, whereas 68 of the 69 cases showed at least focal weak reactivity for P501S (99%). None of the tumors were negative for both markers.
Conclusions: Immunohistochemistry for P501S is a sensitive and highly specific marker for identifying prostate tissue. The large majority of metastatic prostatic adenocarcinomas are P501S positive (99%). A small subset of metastatic prostatic adenocarcinoma shows significant differences in staining intensity and extent for PSA and P501S and, therefore, combined use of these markers may result in increased sensitivity for detecting prostatic origin.