clinical models for discriminating insignificant prostate cancer from significant prostate cancer. Since MRSI is more specific than conventional MRI for identification of prostate cancer, one could expect that the MRI/MRSI model was the most discriminating (area under the curve 0.854) and performed significantly better than MRI model alone and other clinical models. As pointed out by the authors the major limitation of the model is that they are vulnerable to upgrading of the biopsy Gleason grade after radical prostatectomy; 26% of the patients of this series had their Gleason scores upgraded. This was particularly important in 7% of the patients of this series. The authors emphasizes that their goal was not produce MRI models ready for clinical use, but rather to test the feasibility of creating such models. In our institution, we already started a prospective clinical study in order to validate this MRI/MRSI model.

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UROGENITAL TRAUMA

Blunt Renal Trauma: Comparison of Contrast-Enhanced CT and Angiographic Findings and the Usefulness of Transcatheter Arterial Embolization

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Background: The purpose of this study was to evaluate the role of contrast-enhanced CT and the usefulness of superselective embolization therapy in the management of arterial damage in patients with severe blunt renal trauma.
Patients and Methods: Nine cases of severe renal trauma were evaluated. In all cases, we compared contrast-enhanced CT findings with angiographic findings, and performed transcatheter arterial embolization (TAE) in six of them with microcoils and gelatin sponge particles. Morphological changes in the kidney and site of infarction after TAE were evaluated on follow-up CT Chronological changes in blood biochemistry findings after injury, degree of anemia and renal function were investigated. Adverse effects or complications such as duration of hematuria, fever, abdominal pain, renovascular hypertension and abscess formation were also evaluated.
Results: The CT finding of extravasation was a reliable sign of active bleeding and useful for determining the indication of TAE. In all cases, bleeding was effectively controlled with superselective embolization. There was minimal procedure-related loss of renal tissue. None of the patients developed abscess, hypertension or other complications.
Conclusions: In blunt renal injury, contrast-enhanced CT was useful for diagnosing arterial hemorrhage. Arterial bleeding may produce massive hematoma and TAE was a useful treatment for such cases. By using selective TAE for a bleeding artery, it was possible to minimize renal parenchymal damage, with complications of TAE rarely seen.

Editorial Comment

The use of transcatheeter arterial embolization is a useful tool when managing renal traumatic injuries. There are typically two situations where embolization is needed, in the acute setting bleed and in a delayed bleed (usually 10-14 days after initial injury). In the acute setting, on the arterial phase images of the CT there is a characteristic "blush" (as in splenic trauma), which suggests a significant arterial injury. While we speak of the retroperitoneum as a confined space that can hold up to 4 to 8 units of blood, the tamponade effect is typically applicable to significant venous bleeding and not arterial injuries. Most major trauma centers are lucky to have a skilled vascular and intervential radiologist who can perform a super selective branch of the renal artery embolization. In the delayed setting, bleeding usually occurs 7 to 14 days after the initial injury. It is at this time that the hematoma starts to lyse and thus releases the tamponade effect. It is also the time it usually takes for a pseudoaneurysm to occur. While AAST Grade V real injuries are life threatening arterial injuries that warrant exploration, all lesser degrees of renal injuries usually do not cause hemodynamic instability and can thus be managed expectantly. With lesser degree renal injuries, the cause for hypotension is typically from associated intra-abdominal injuries and not the kidney injury itself. The reasons for such hemodynamic stability is that fracture lines in the shattered kidney are typically radial in fashion and parallel to the interlobar arteries, and not through them. This is why the kidney can often seem to be broken into multiple pieces yet the parenchyma still be bright, with intravenous contrast on the nephrographic phase images. As to the infarcted parenchyma after embolization, when the segment of parenchyma is large (usually more than 25%) the patient will often have "post-infraction" spiking fevers and a white count for 2 to 3 days, which resolve spontaneously. I have had the same experience as the authors as to complications after embolization. I have not seen a single case of abscess or sustained hypertension. While episodes of transient hypertension are not uncommon, prolonged hypertension is exceedingly rare (less then 1% overall).

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Single Kidney and Sports Participation: Perception versus Reality

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Objectives: Physician opinions and practice patterns regarding the participation of children and adolescents with single, normal kidneys in contact/collision sports are widely varied. We hypothesize that limitation of participation from play based only on the presence of a single kidney is not supported by available data. We sought to determine recommendations of pediatric nephrologists regarding the participation of patients with single, normal kidneys in contact/collision sports and review the literature to determine the rate of sports-related kidney injury compared with other organs.
Methods: Members of the American Society of Pediatric Nephrology were surveyed regarding their recommendations for participation of patients with single, normal kidneys in contact/collision sports. Medical and sports literature databases were searched to determine sports-related kidney, brain, spinal cord, and cardiac injury rates and the sports associated with kidney injury.
Results: Sixty-two percent of respondents would not allow contact/collision sports participation. Eighty-six percent of respondents barred participation in American football, whereas only 5% barred cycling. Most cited

traumatic loss of function as the reason for discouraging participation. The literature search found an incidence of catastrophic sports-related kidney injury of 0.4 per 1 million children per year from all sports. Cycling was the most common cause of sports-related kidney injury causing > 3 times the kidney injuries as football. American football alone accounted for 0.9 to 5.3 fatal brain injuries and 4.9 to 7.3 irreversible spinal cord injuries per 1 million players per year. Commotio cordis causes 2.1 to 9.2 deaths per year.
Conclusions: Most pediatric nephrologists prohibit contact/collision sports participation by athletes with a single kidney, particularly football. The available evidence suggests that cycling is far more likely to cause kidney injury. In addition, kidney injury from sports is much less common than catastrophic brain, spinal cord, or cardiac injury. Restricting participation of patients with a single, normal kidney from contact/collision sports is unwarranted.

Editorial Comment

Recommendations for patients who have a solitary kidney and participation in organized sports and so-called alternative extreme sports is controversial. Admittedly, children are more likely than adults to sustain renal injury from blunt abdominal trauma due to kidney relative size and lack of peri-renal fat and lack of bone and rib ossification. In general, patients with two normal kidneys and injury to one kidney in an accident or sports related event, I typically tell these patients to limit their activity to non strenuous activities and no lifting greater then 20 pounds for 1 to 3 months (1 month for non contact sports and 3 months for contact sports, such as football). The recommendation of the American Academy of Pediatrics Committee on Sports Medicine and Fitness is that children with a solitary kidney should not play team contact sports. However, what is the true incidence of high-grade renal injuries broken down by type of sport?

Johnson et al. (1) noted that high-grade injuries and renal loss in children occurred as a result of motor vehicle accidents, pedestrian versus motor vehicle and falls. No kidneys were lost to contact sports. Sledding, skiing and rollerblading resulted in kidney loss. Brown et al. (2) noted that all high-grade renal injuries resulted from bicycle accidents and none from team sports. It appears, therefore, that activities like bicycling, motorcross, skiing and the like, entail much higher speed and momentum then contact sports. Thus the mechanism of injury is much more severe with such activities then with contact sports, and helps to explain why high-grade injuries are rare with team sports (such as soccer and football). In conclusion, we feel that recommendations about participation in team sports and a solitary kidney appear to be overly protective and need to be re-evaluated with a metanalysis. However, non-team sports such as sledding, skiing, biking, atving and motorcross are risky activities for the solitary kidney child.

References

1. Brown S, Elder J, Spirnak J: Are pediatric patients more susceptible to major renal injury from blunt trauma? A comparative study. J Urol. 1998;160: 138-40.
2. Johnson B, Christensen C, Dirusso S, Choudhury M, Franco I: A need for reevaluation of sports participation recommendations for children with a solitary kidney. J Urol. 2005; 174: 686-9.

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