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0196-0644/$-see front matter

doi:10.1016/j.annemergmed.2008.07.044

Figure 1. Anterior view, methylene blue arthrogram, right knee.

Figure 2. Lateral view, methylene blue arthrogram, right knee. Used with permission of David M. Lemonick, MD, Emergency Department, Highlands Hospital, Connellsville, PA.

[Ann Emerg Med. 2009;53:425.]

A 26-year-old man presented to the emergency department with a chief complaint of a right knee injury sustained shortly before admission. He flipped his bicycle and struck his right knee on a rock, sustaining a laceration. The patient described a gush of fluid from the laceration when he attempted to stand, and he was unable to walk because of severe knee pain. Physical examination revealed a 3-cm transverse laceration of the distal anterolateral right thigh, approximately 8 cm proximal to the patella. The knee examination showed tenderness in the peripatellar areas, no effusion, normal but painful range of motion, and normal neurovascular and tendon exams. Knee radiograph results were negative for bony abnormalities, foreign body, or intraarticular air. Methylene blue was instilled into the joint through a medial approach, and it extravasated from the laceration (Figures 1 and 2).

For the diagnosis and teaching points, see page 438.
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Publication date: Available online December 20, 2008.

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REFERENCES

1. Green SM. Research advances in procedural sedation and analgesia [editorial]. *Ann Emerg Med.* 2007;49:31-36.
2. Campbell SG, Magee KD, Kovacs GJ, et al. Procedural sedation and analgesia in a Canadian adult tertiary care emergency department: a case series. *CJEM.* 2006;8:85-93.
3. Willman EV, Andolfatto G. A prospective evaluation of "ketofol" (ketamine/propofol combination) for procedural sedation and analgesia in the emergency department. *Ann Emerg Med.* 2007; 49:23-30.
4. Godambe SA, Elliot V, Matheny D, et al. Comparison of propofol/ fentanyl versus ketamine/midazolam for brief orthopedic procedural sedation in a pediatric emergency department. *Pediatrics.* 2003;112:116-123.
5. Guenther-Skokan E, Pribble C, Bassett KE, et al. Use of propofol sedation in a pediatric emergency department: a prospective study. *Clin Pediatr.* 2001;40:663-671.
6. Messenger DW, Murray HE, Dungey PE, et al. Subdissociative-dose ketamine versus fentanyl for analgesia during propofol procedural sedation: a randomized controlled trial. *Acad Emerg Med.* 2008;15:877-886.
7. Cummins RO, Chamberlain DA, Abramson NS, et al. Recommended guidelines for uniform reporting of data from out-of-hospital cardiac arrest: the Utstein style. *Circulation.* 1991;84: 960-975.
8. Bhatt M, Kennedy RM, Osmond MH, et al. Consensus-based recommendations for standardizing terminology and reporting adverse events for emergency department procedural sedation and analgesia in children. *Ann Emerg Med.* 2009;53:426-435.
9. Krauss B, Green SM. Sedation and analgesia for procedures in children. *N Engl J Med.* 2000;342:938-945.
10. Krauss B, Green SM. Procedural sedation and analgesia in children. *Lancet.* 2006;367:766-780.
11. Gill M, Green SM, Krauss B. A study of the bispectral index monitor during procedural sedation and analgesia in the emergency department. *Ann Emerg Med.* 2003;41:234-241.
12. Joint Commission on Accreditation of Healthcare Organizations. *Sedation and Anesthesia Care Standards*. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations. Available at: http://www.jointcommission.org/.
13. Green SM, Roback MG, Miner JR, et al. Fasting and emergency department procedural sedation and analgesia: a consensus-based clinical practice advisory. *Ann Emerg Med.* 2007;49:454-461.
14. Krauss B, Hess DR. Capnography for procedural sedation and analgesia in the emergency department. *Ann Emerg Med.* 2007; 50:172-181.

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DIAGNOSIS:

Open joint injury. The knee is the major joint most frequently involved in open joint injuries.[1] In the civilian setting, gunshot wounds and motor vehicle crashes are responsible for the majority of these wounds. An open joint may result from direct penetration of the joint or by extension into the knee of a compound periarticular fracture. Knee dislocations are open in 20% to 30% of cases.[1] Any deep wound in proximity to a joint should be suspected of being an open joint injury.

Detection of an open joint may be immediately evident on inspection of the wound, or it may be subtle, requiring adjunctive testing. The criteria for making the diagnosis include a visible or palpable opening into the joint, air or foreign bodies in the joint on radiographic examination, or saline solution extravasation through the wound on arthrocentesis.[2] In questionable cases, methylene blue may be added to the arthrocentesis irrigant. Initial treatment requires meticulous debridement of the wound and broad-spectrum antibiotics. All major open joint injuries require formal operative joint exploration and irrigation.[2]

REFERENCES

1. Carr NJ, Gallico G. Soft tissue injuries and management about the knee. In: Siliski JM, ed. *Traumatic Disorders of the Knee*. New York, NY: Springer-Verlag; 1994:62.
2. Mandavia D, Newton EJ, Demetriades D. *Color Atlas of Emergency Trauma*. Cambridge, England: Cambridge University Press; 2003:171–172.