Percutaneous Vertebroplasty

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Book Reviews

Percutaneous Vertebroplasty
John M. Mathis, Hervé Deramond, and Stephen M. Belkoff, eds. New York: Springer; 2002. 221 pages, 162 illustrations. $149.00

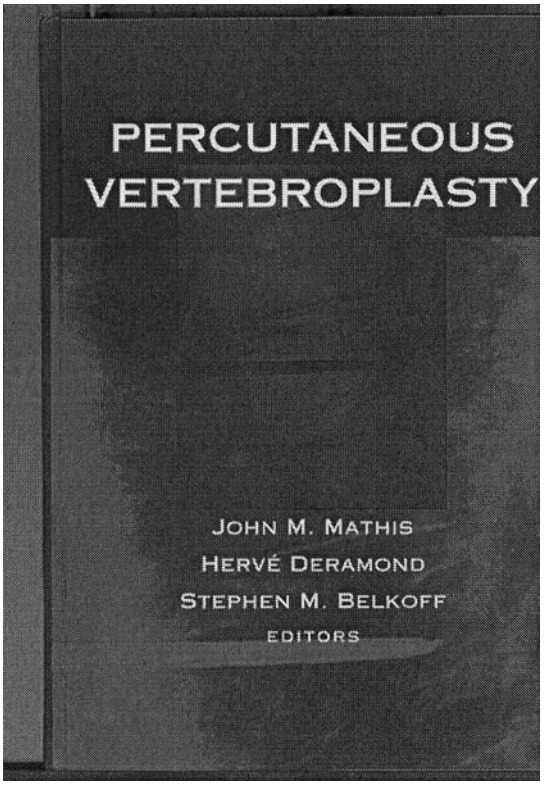
Percutaneous Vertebroplasty is a short, yet comprehensive, well-written, and well-illustrated text covering all areas of percutaneous vertebroplasty. The authors, many of whom are the principal drafters of the American College of Radiologists (ACR) standards for the performance of percutaneous vertebroplasty, include Barr, Belkoff, Boutry, Chiras, Cortet, Cotten, Curcin, Depriester, Deramond, Dion, Kostuik, Mathis, Obuchowski, Olan, Ortiz, Stallmeyer, Wong, and Zoarski. Topics addressed include relevant anatomy, pathophysiology of osteoporosis, patient selection criteria, biomechanics, percutaneous vertebroplasty and percutaneous kyphoplasty techniques, complications, building a practice, and future directions in spinal augmentation.

Chapters 1 and 2—"Introduction" and "Spine Anatomy"—discuss European and American experiences with percutaneous vertebroplasty. A thorough review of cervical, thoracic, and lumbar pedical anatomy, including, size, angle and orientation, and differences in the relationship of the exiting nerve roots, is included, along with a review of pedical targeting and various needle approaches. The images are of good quality, although a printing error in my text on page 20 obscured Figure 2.

Chapter 3—"Osteoporosis: Medical and Surgical Options"—covers epidemiology, bone densitometry, medical treatments, fracture biomechanics, and stability. The chapter is well written but could be combined with chapter 5—"Biomechanical Considerations"—which covers in greater depth biomechanics, bone densitometry, and possible mechanisms of pain relief. Included is an overly technical review of cement and vertebral body tests.

Chapter 4—"Patient Evaluation and Selection"—begins by reiterating epidemiologic and physiologic information about osteoporosis already covered in chapter 3; however, the chapter continues with an important review of the indications and contraindications of percutaneous vertebroplasty, patient screening, and preprocedure, evaluation including patient instructions, lab tests, examination, discussion of potential complications, expectations, and so forth.

Chapter 6—"Techniques and Materials: Tumors and Osteoporotic Fractures"—is the "how-to" portion of the text. Mathis discusses his experience and gives recommendations concerning the procedure room, monitoring equipment, single versus biplane fluoroscopy, prophylactic antibiotics, local anesthesia versus conscious sedation versus general anesthesia, transpedicular versus parapedicular (transcostovertebral) needle placement, venography, cement opacification, and postprocedure discharge instructions.



Chapter 7—"Balloon Kyphoplasty"—includes a thorough discussion of the technique of kyphoplasty, including the end point of balloon inflation, volume of cement for injections, advantages over percutaneous vertebroplasty, and published results. No comparison is made with the combination of external traction and percutaneous vertebroplasty, which the authors of chapter 9 describe as being useful to help restore vertebral body height. It is interesting that the authors of chapter 7 describe a posterolateral needle approach that the authors of chapters 2 and 6 do not advocate.

Chapter 8—"Tumors"—is divided into three parts: metastastic tumors, myeloma, and benign tumors. Indications and contraindications and the challenges involved when performing percutaneous vertebroplasty in a vertebral body with a destroyed cortex are discussed. "If there is extension of the tumor through the posterior wall, percutaneous vertebroplasty should be used only after a multidisciplinary discussion, and a surgical team should be available in case spinal decompression is needed" is underscored. This chapter also describes the use of percutaneous vertebroplasty in conjunction with other therapies, includ-

ing the injection of ethanol and N-butyl cyanoacrylate glue. Although these techniques are interesting, they are not likely to be performed by most physicians learning the percutaneous vertebroplasty-percutaneous kyphoplasty procedure.

Chapter 9—"Extreme Vertebroplasty: Techniques for Treating Difficult Lesions"—reviews the use of percutaneous vertebroplasty for malignant tumors with disruption of the posterior vertebral margin by using a combination of CT and fluoroscopy, coaxial needle placement with exchange of small for large needles, the use of traction for height restoration, and the use of small-bore, laterally placed needles for extreme vertebral collapse.

Chapter 10—"Complications"—discusses both common and uncommon complications of percutaneous vertebroplasty, including spinal infections, transitory increase in pain and fever, rib fractures, radiculopathy and cord compression, pulmonary emboli, and hemorrhage. Included is a review of the literature and antedotal advice to reduce the incidence of complications.

Chapter 11—"Starting a Clinical Practice"—discusses ACR standards for the performance of percutaneous vertebroplasty and gives advice on selecting your first patient, preprocedure consultation, follow-up interviews, and so forth.

Chapter 12—"Future Directions"—includes a discussion of advances in needle design, cement delivery systems, optimal properties of cement such as bioactive materials that promote bone ingrowth and remodeling, and improved radiopacity. Additional potential sites for bone augmentation are included.

In summary, *Percutaneous Vertebroplasty* provides a well-written, organized, comprehensive review of all aspects of the procedure. For the inexperienced practitioner just learning percutaneous vertebroplasty, the CD-ROM *Vertebroplasty* is recommended over this text. All three editors, as well as many of the chapter authors of *Percutaneous Vertebroplasty,* contributed to the CD-ROM, which contains video and three-dimensional animations that could be of great help to the novice interested in learning the basics of percutaneous vertebroplasty. For the more experienced practitioner interested in furthering his or her knowledge of extreme vertebroplasty, or those who simply prefer a text over a CD-ROM, the text is recommended.