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Surgical Management of Low Back Pain

Daniel K. Resnick and Regis W. Haid, Jr. Rolling Meadows, Ill: American Association of Neurological Surgeons. 2001. 164 pages. \$85.00.

Few radiologic studies—including plain radiographic, CT, or MR imaging studies—are ordered more frequently than those requested for patients with a history of low back pain (LBP) (whether the LBP is present in a patient who has not undergone surgery previously or in a patient with failed back syndrome). The approaches to the treatment of LBP are far from uniform among orthopedic surgeons, neurologic surgeons, neurologists, physiatrists, and general practitioners. Often, the approach is based on the treatment du jour. As a result, a host of workup schemes, numerous procedures of varying invasiveness, and multiple surgical approaches have been used over the years. Radiologists must be aware of the current surgical procedures used in the management of LBP and the rationale for each of these. Those procedures plus other important concepts in LBP are covered in *Surgical Management of Low Back Pain* edited by Drs Resnick and Haid.

These two neurosurgeons have compiled the critical concepts involved in back surgery in an easily readable book. Nineteen of the contributors are from surgical departments, and one, Victor Haughton, is a neuroradiologist. These contributors cover the topics in LBP, summarizing current concepts in the pathophysiology of LBP and describing the selection criteria for fusion; evaluation of LBP; discography; failed back syndrome; various lumbar fusion approaches; failed back syndrome; and intradisc electrothermal, annuloplasty, and spinal cord stimulation for the treatment of chronic intractable benign back pain. What this reviewer believes will be of greatest interest to neuroradiologists are chapters that detail the various surgical interventions, such as posterior lumbar intrabody fusions (PLIFs), anterior lumbar intrabody fusions (ALIFs), and posterolateral fusions and their variations. The strength of these chapters lie in their discussions of the indications and relative contraindications for the different approaches, along with current thoughts related to various intervertebral body implants and pedicle screw supplementation to provide spine stability. The relationship of the type of fusion approach and the development of potential CSF leaks is of special interest to radiologists because we are not infrequently called upon to determine if a leak exists and where that leak is.

The surgical details of the various types of fusions used to stabilize the spine allows the radiologist to fully appreciate what is done and what might be expected with postoperative imaging. As one example, a step-by-step description of an impacted PLIF versus a standard PLIF is included; this description contains interesting information that may be new to most readers, except for the few who have had spinal surgical training. The descriptions are short and accompanied by drawings that

are immensely helpful in understanding the procedures. The descriptions of the historical development and surgical implementation of PLIF, ALIF, transforaminal lumbar interbody fusion, and common posterolateral fusion procedures provide the reader with a clear understanding of the options available with these approaches.

Another chapter of particular interest to this reviewer contains information about geometric considerations in fusions. Here, topics such as the preparation of the bed into which a bone graft is placed, the proper positioning of a strut graft, and the proper shape of a bone strut are described and amply illustrated with line drawings. Few radiologists pay close attention to such geometry when they read postoperative images. Here, the suggestion to the authors may be to include radiographics to show these points rather than to rely solely on artists' renditions. In fact, throughout the book, except in the chapter that deals with MR imaging exclusively, the quality of the radiographic images ranges from adequate to poor. The authors are urged to present more detailed images reproduced on higher quality paper and to include thorough descriptions of those images in future editions. This reviewer is struck by the disparity between the excellent line drawings and the dismal radiographic images.

The rationale for many routine imaging observations is given. Examples include explanations of the compression constructs used with interbody fusion, the ideal depth for a bone implant in adjacent vertebral bodies, the composition and appearance of various interbody fusion devices and metallic cages, the expected rates of fusion failure with different approaches, the reason a particular surgical approach is used, the ideal implant location within the disc space, the decrease in disc space that is considered normal after the placement of an interbody device, and so on. The book also addresses issues that, although they are not specifically related to imaging analysis, often creep into one's mind. These issues include the clinical indications for the use of one approach instead of another, the problems associated with multilevel interbody fusion, and the underlying causes of poor clinical outcomes in patients who have undergone extensive posterior surgery.

Other material may be of interest to the radiologist, namely, discussions about facet syndrome, which is important to those involved in facet joint injections; discography, for which the authors provide balanced views of the pros and cons of this procedure; and failed surgical back syndrome, for which the description is complete but strangely devoid of any images.

In summary, this text is highly recommended to all radiologists, particularly those who work closely with spinal surgeons.