

Arthritis & Arthroplasty The Spine

Francis H. Shen • Christopher I. Shaffrey

Arthritis & Arthroplasty: The Spine

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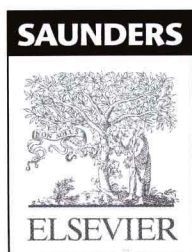
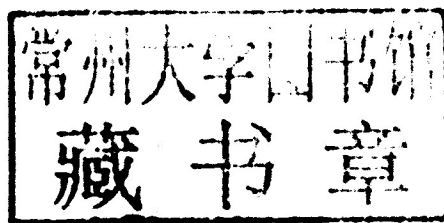
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To my daughter, whose beautiful smile and endless energy keeps me happy and young, and to my parents, a source of continual support and inspiration.

-F.H.S.

To my loving and devoted family.

-C.I.S.



Foreword

As the editors indicate in the Preface, this series was developed in an effort to address the broad spectrum of orthopedic reconstructive practice involving joint pathology, with an emphasis on joint replacement arthroplasty. There have been other somewhat similar efforts to provide the orthopedic community with a comprehensive compendium of orthopedic knowledge. The feature that sets this particular effort apart is the fact that the authors have a focus, even though the spectrum is quite broad. The clear goal is to provide the surgeon with a comprehensive, up-to-date, detailed, user-friendly source of information that provides a basis for improved patient care related to the management of the arthritic joint. The approach and organization by individual anatomic site for each specific volume is not new, but this series is unique. The tremendous burden to provide a standardized format and a consistent quality of information and illustrations has been addressed and effectively realized in this series. I am impressed at the editors' selection of contributors, which includes both younger talent of our profession as well as well-recognized and established individuals. This offers a nice balance and blend of current and emerging orthopedic thought that is clearly conveyed through these pages.

Both the series and volume editors are well recognized for their interest and competency in joint reconstructive surgery. Their energy and organizational skills are evident in this compendium.

From my standpoint, this initiative certainly does fill a niche that, in spite of the numerous efforts from various perspectives, addresses an area of need in the orthopedic spectrum of knowledge. The specific attractive features include the standardized format within a given volume that is carried throughout each of the volumes. The fact that the chapters are organized to allow a quick review of the content is readily identified as keeping with the "sound bytes" learning style of the orthopedic surgeons of today. This is best recognized in the sections dealing with the pearls and pitfalls. Thus, these texts provide an interesting blend of abbreviated insights supported by detail and substance. The orthopedist's passion and need for visual validation of our thinking and understanding is captured in the video sections that are laced throughout this series. The figures are clear; the references are comprehensive but not exhaustive. Thus, one easily recognizes the effort to make this a user-friendly, comprehensive, up-to-date, technique-oriented source of truth for the busy orthopedic surgeon.

The aggressive goal and vision of the editors has been very well realized in these volumes. It is highly likely that some of these volumes, if not the entire series, will be considered a must for the busy orthopedic surgeon dealing with the arthritic joint.

B.F. MORREY, MD



Preface

Like all areas of surgery, the decision to operate—and at times when not to operate—is not always an easy decision. This is particularly challenging in the management of spinal pathologies. Radiographic abnormalities are very common in patients presenting for evaluation of spinal disorders. Although the combination of a careful history, physical examination, and imaging will often yield a diagnosis, a thorough understanding of psychosocial and economic issues is needed prior to recommending a surgical procedure. Performing the “right” operation on the “wrong” patient will almost certainly give a poor result. There are few absolute recommendations in surgical approach or selection of the type of spinal instrumentation. Selection of the ideal operative approach is complicated by a constant evolution in surgical techniques and advances in spinal implants. Management strategies can be challenging enough for the experienced spine surgeon, but even more difficult for the spine surgeon just starting out in practice.

We hope that this textbook will serve as a reference for all of our readers. We believe that it should prove to be particularly beneficial for those early in their practice, but also provide information in newer techniques for the experienced spine surgeon. We were extremely fortunate to have worked

with a group of contributors that are not only well known specialists in the field of spine surgery, but also experts in the particular topics that they covered. In this volume, we have not only grouped the conditions by anatomic region (i.e., cervical, thoracic, and lumbar spine) but by topic as well (i.e., deformity, complications, minimal invasive surgery, and emerging technologies). While there is certainly overlap between sections, this should make finding the appropriate topics easier and help to organize pathologies in the mind of the reader.

The decision to proceed with surgery is ultimately based on a discussion between the patient and their surgeon. In the end, the selection of the surgical procedure should be tailored to the patient and not the patient to the procedure. Spine surgery will almost certainly continue to evolve, and it will be incumbent on the practicing spine provider to continually update their knowledge. We hope that this volume of work will be part of that continual self-improvement.

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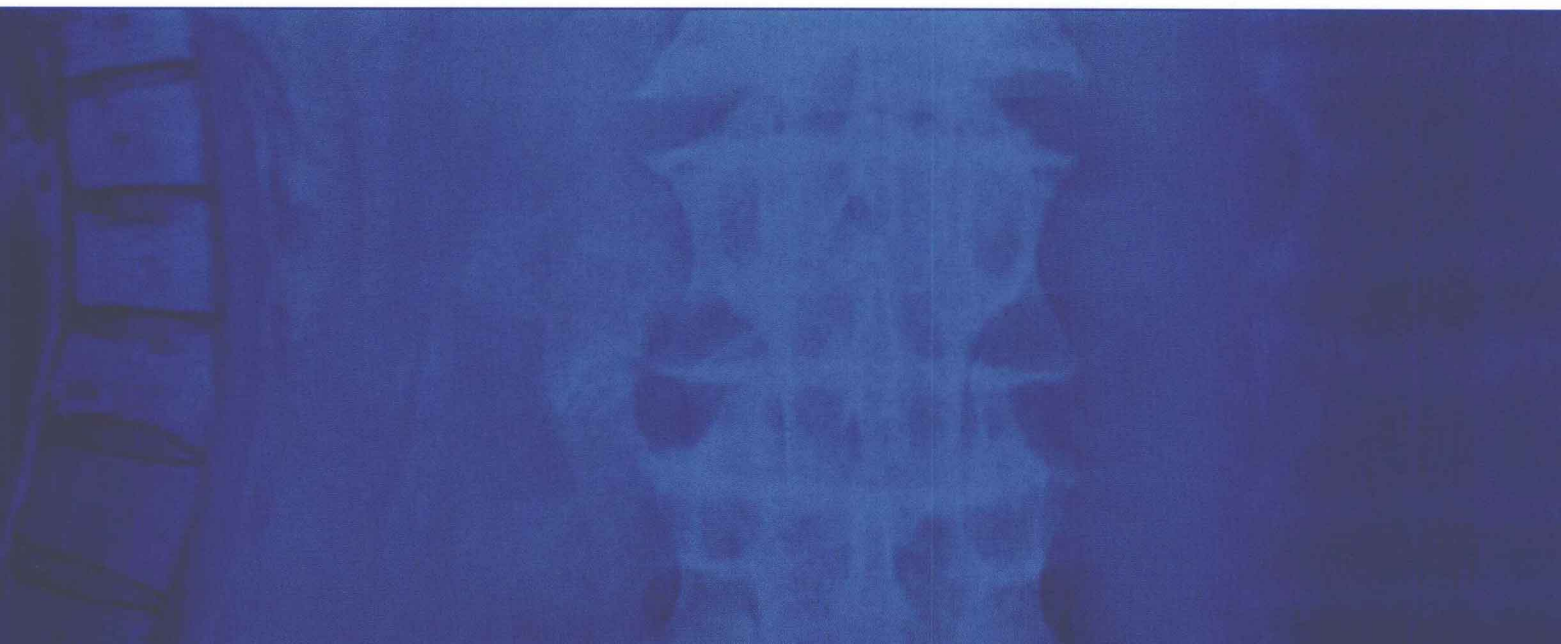
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PART I

Spine



Preoperative Evaluation of the Spine

Jonathan A. Tuttle • Norman B. Chutkan

CHAPTER PREVIEW

CHAPTER SYNOPSIS: Careful preoperative evaluation of the spine patient is of paramount importance to the success of the treatment being initiated. This begins with careful history followed by physical examination and appropriate imaging. The physician must have a thorough knowledge of the anatomy of the pathologic area, as well as an understanding of other factors that can complicate these cases such as secondary gain issues. At the conclusion of a thorough history and physical examination, the physician should have been able to significantly narrow the differential diagnoses. Appropriate imaging with plain radiography, magnetic resonance imaging, computerized tomography, and/or myelography can then be obtained to verify the diagnosis and to guide the formation of an appropriate treatment plan.

IMPORTANT POINTS:

- 90% of patients with an acute disc herniation causing a radiculopathy will improve with nonoperative management.
- The most common cervical levels that require surgical intervention are C5-6 and C6-7.
- Surgical intervention is much less common for disease in the thoracic spine than in the cervical and lumbar spine with the notable exception of thoracolumbar trauma.
- Mechanical back pain is the most common cause of lumbar spine complaints.
- History and physical examination are the most appropriate first steps in determining the presence of more severe disease such as radiculopathy, myelopathy, or myeloradiculopathy.
- The key to a successful surgical outcome lies first in a careful and thorough preoperative patient evaluation.

CLINICAL PEARLS:

- Although characteristic findings may be associated with pathology at each individual spinal level, some crossover and variability are common.
- Cervical spondylotic myelopathy is of primary concern in patients older than 55 years, and is characterized by a combination of hand “clumsiness” and gait unsteadiness.
- Cervical radiculopathy usually occurs in younger patients and is frequently caused by a disc herniation; this can also occur in patients older than 55 years with cervical spondylosis.
- Patients involved in litigation or workers’ compensation claims may have secondary gain issues that affect their pain and treatment outcome.
- Waddell described five signs to help determine the presence of nonorganic low back pain:
 - a. Pain with axial loading
 - b. Inconsistent performance during examination
 - c. Exaggerated response to physical examination
 - d. Inappropriate diffuse or superficial pain
 - e. Motor or sensory findings that are not consistent with normal anatomy

CLINICAL/SURGICAL PITFALLS:

- The majority of lumbar pain is simple mechanical back pain, but careful examination must be done in every case to confirm that diagnosis.
- A high index of suspicion is necessary for conditions such as cauda equina syndrome, which, although rare, is an indication for urgent diagnosis and surgical intervention.
- Caution should be used when considering issues such as possible secondary gain so as not to miss “red flags” in the history and physical examination that might indicate more serious pathology.
- Advanced imaging should never take the place of a thorough history and physical examination to make a diagnosis of spine pain, but it should be used to confirm that diagnosis and treatment plan.

VIDEO AVAILABLE:

N/A