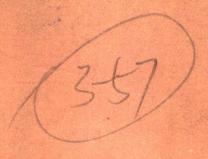
CONTROVERSIES in ORTHOPAEDIC SURGERY

ROBERT E. LEACH, M.D.

FRANKLIN T. HOAGLUND, M.D.

EDWARD J. RISEBOROUGH, M.D.



CONTROVERSIES in ORTHOPAEDIC SURGERY

ROBERT E. LEACH, M.D.

Chairman, Department of Orthopaedic Surgery University Hospital Boston, Massachusetts

FRANKLIN T. HOAGLUND, M.D.

Professor in Residence, Department of Orthopaedics University of California School of Medicine San Francisco, California

EDWARD J. RISEBOROUGH, M.D.

Department of Orthopaedic Surgery Children's Hospital Medical Center Boston, Massachusetts

and
Forty-five Contributing Authors

1982

W. B. SAUNDERS COMPANY
Philadelphia/London/Toronto/Mexico City/Sydney/Tokyo

W. B. Saunders Company:

West Washington Square Philadelphia, PA 19105

1 St. Anne's Road

Eastbourne, East Sussex BN21 3UN, England

1 Goldthorne Avenue

Toronto, Ontario M8Z 5T9, Canada

9 Waltham Street

Artarmon, N.S.W. 2064, Australia

Library of Congress Cataloging in Publication Data

Leach, Robert E.

Controversies in orthopaedic surgery.

I. Hoaglund, Franklin T. 1. Orthopedic surgery. II. Riseborough, Edward J. III. Title. [DNLM: 1. Orthopedics. WE 168 L434c]

RD731.L37

617'.3

81-50273

ISBN 0-7216-5657-9

AACR2

Controversies in Orthopaedic Surgery

ISBN 0-7216-5657-9

© 1982 by W. B. Saunders Company. Copyright under the Uniform Copyright Convention. Simultaneously published in Canada. All rights reserved. This book is protected by copyright. No part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher. Made in the United States of America. Press of W. B. Saunders Company. Library of Congress catalog card number 81-50273.

Last digit is the print number:

CONTRIBUTORS

WILLIAM C. ALLEN, M.D.

Professor and Chief of Orthopaedic Surgery, University of Missouri; Attending Physician, University of Missouri Health Sciences Center, Harry S Truman Memorial Veterans Hospital, Columbia, Missouri.

Meniscectomy

FRED L. ALLMAN, JR., M.D.

Director of Sports Medicine, Doctors Memorial Hospital, Atlanta, Georgia; Director, Sports Medicine Clinic, Atlanta, Georgia.

Nonoperative Treatment of Acromioclavicular Injuries

ALLEN W. BACH, M.D.

Assistant Professor of Orthopaedic Surgery; Associate Chief, Department of Orthopaedics, Harborview Medical Center, Seattle, Washington.

Closed Intramedullary Nailing of the Femur

SIR GEORGE M. BEDBROOK, O.B.E.

Orthopaedic Consultant, Royal Perth Rehabilitation Hospital, Shenton Park, Western Australia.

Conservative Management of Fracture Dislocations of the Spine

BO R. BERGMAN, M.D., Ph.D.

Associate Professor, University of Arkansas for Medical Sciences; Consultant in Orthopaedic Surgery, Eastern Hospital, Goteborg, Sweden; Research Fellow, Department of Orthopaedic Surgery, University of Arkansas for Medical Sciences, Little Rock, Arkansas.

Ender Nailing of Intertrochanteric Fractures

PAUL W. BROWN, M.D.

Clinical Professor of Orthopedic Surgery and Plastic Reconstructive Surgery, Yale University School of Medicine, New Haven, Connecticut; Chairman, Department of Surgery, St. Vincent's Medical Center, Bridgeport, Connecticut; Consultant in Hand Surgery, Veterans Administration Hospital, West Haven, Connecticut.

Nonoperative Treatment of Tibial Shaft Fractures

A. CATTERALL, M. CHIR., F.R.C.S.

Consultant Orthopaedic Surgeon, Royal National Orthopaedic Hospital, Charing Cross Hospital, London.

Femoral Osteotomy

JAY S. COX, M.D.

Assistant Clinical Professor of Surgery, Uniformed Services University of the Health Sciences, Chief of Orthopaedic Surgery and Director of Sports Medicine, U.S. Naval Academy, Annapolis, Maryland.

Treatment of Acromioclavicular Injuries

JAMES C. DRENNAN, M.D.

Director of Orthopaedics, Newington Children's Hospital, Newington, Connecticut.

Orthotic Management of Legg-Perthes Disease

NAS S. EFTEKHAR, M.D.

Assistant Clinical Professor of Orthopedic Surgery, College of Physicians and Surgeons, Columbia University; Associate Attending Orthopedic Surgeon, New York Orthopedic Hospital at Columbia Presbyterian Medical Center, New York, New York.

The Transtrochanteric Approach in Hip Arthroplasty

C. McCOLLISTER EVARTS, M.D.

Dorris H. Carlson Professor of Orthopaedics and Chairman, Department of Orthopaedics, University of Rochester School of Medicine and Dentistry; Orthopaedist-in-Chief, Strong Memorial Hospital, Rochester, New York.

Osteotomy of the Greater Trochanter

H. F. FARFAN, M.D., M.Sc., C.M., F.R.C.S.(Eng)

Orthopaedic Surgeon, St. Mary's Hospital, Quebec, Canada.

Spinal Fusion

ALBERT B. FERGUSON, JR., M.D.

Silver Professor and Chairperson, Department of Orthopaedic Surgery, University of Pittsburgh; Chief of Orthopaedic Surgery, University of Pittsburgh Medical Center Hospitals, Pittsburgh, Pennsylvania.

Congenital Dislocation of the Hip

MICHAEL H. GERDES, M.D.

Assistant Professor, University of Arkansas for Medical Sciences; Attending Orthopaedist, University of Arkansas for Medical Sciences, Arkansas Children's Hospital, Little Rock Veterans Administration Hospital, Doctors' Hospital, Little Rock, Arkansas.

Ender Nailing of Intertrochanteric Fractures

SIGVARD T. HANSEN, JR., M.D.

Professor and Chairman, Department of Orthopaedic Surgery, University of Washington; Orthopaedist in Chief, Harborview Medical Center, Seattle, Washington.

Closed Intramedullary Nailing of the Femur

LESLIE J. HARRIS, M.D.

Assistant Clinical Professor of Orthopedic Surgery, University of Southern California School of Medicine; Attending Orthopedic Surgeon, University of Southern California School of Medicine, Los Angeles, California; San Pedro Peninsula Hospital, San Pedro, California.

Closed Condylocephalic Nailing of Intertrochanteric Fractures

NORMAN A. HILL, M.D.

Professor of Clinical Orthopaedic Surgery, New York Medical College; Attending Orthopaedic Surgeon, St. Luke's-Roosevelt Hospital Center and Metropolitan Hospital Center, New York, New York.

Arthroplasty of the Thumb Basal Joints

ARTHUR RALPH HODGSON, O.B.E., M.B., Ch.B., F.R.C.S.E., F.A.C.S., F.R.A.C.S.

Emeritus Professor of Orthopaedic Surgery, University of Hong Kong. Surgical Treatment of Tuberculosis of the Spine

HAMILTON E. HOLMES, M.D.

Clinical Assistant Professor of Orthopaedic Surgery, Emory University; Attending Staff, Georgia Baptist Medical Center, Crawford W. Long Hospital, Rockdale County Hospital, Southwest Community Hospital, Atlanta, Georgia.

Treatment of Herniated Lumbar Disc

DONALD B. KETTELKAMP, M.D.

Professor and Chairman, Department of Orthopaedic Surgery, Indiana University School of Medicine; Chief of Orthopaedic Surgery, Indiana University Hospitals, Indianapolis, Indiana.

Tibial Osteotomy for Unicompartmental Arthritis

PETER KONSTAM, M.D., F.R.C.S.(Ed.)

Former Associate Professor of Surgery, University of Ibadan, Nigeria; Consultant Surgeon, Balfour Hospital, Kirkwall, Orkney Isles, Scotland. Tuberculosis of the Spine

JOHN C. Y. LEONG, M.B., B.S., F.R.C.S., F.R.C.S.E.

Senior Lecturer and Head, Department of Orthopaedic Surgery, University of Hong Kong; Consultant Orthopaedic Surgeon, Queen Mary Hospital, Hong Kong; Consultant Orthopaedic Surgeon, Duchess of Kent Children's Hospital, Hong Kong.

Tuberculosis of the Spine

LARS LINDBERG, M.D., Ph.D.

Visiting Professor of Orthopaedic Surgery, Faculty of Medicine, University of Kuwait; Associate Professor, Swedish Medical Research Council, Department of Orthopaedic Surgery, University of Lund, Sweden.

Treatment of Septic Total Hip Arthroplasty

G. DEAN MACEWEN, M.D.

Clinical Professor of Orthopedic Surgery, Thomas Jefferson University, Philadelphia, Pennsylvania; Medical Director, Alfred I. duPont Institute; Consultant in Orthopedic Surgery, Wilmington Medical Center, Wilmington, Delaware.

Congenital Dislocation of the Hip

LEONARD MARMOR, M.D.

Staff Member, Saint John's Hospital, Santa Monica Hospital, Santa Monica, California.

Unicompartmental Knee Arthroplasty

STEPHEN J. McILVEEN, M.D.

Instructor in Clinical Orthopaedic Surgery, College of Physicians and Surgeons, Columbia University; Assistant Orthopaedic Surgeon, Presbyterian Hospital, New York, New York.

The Transtrochanteric Approach in Hip Arthroplasty

ISAAC STEPHENS McREYNOLDS, M.D.

Associate Professor of Orthopaedic Surgery, Baylor University College of Medicine; Active Staff, Twelve Oaks Hospital; Consulting Staff, Methodist Hospital, St. Luke's Hospital, Texas Children's Hospital, Houston, Texas.

Operative Treatment of the Os Calcis

VERT MOONEY, M.D.

Professor and Chairman, Orthopaedic Division, University of Texas Southwestern Medical School; Chief of Orthopaedic Surgery, Parkland Hospital, Dallas, Texas.

Nonoperative Care of the Fractured Femur

WILLIAM R. MURRAY, M.D.

Professor and Chairman, University of California School of Medicine, Department of Orthopaedic Surgery, San Francisco, California.

Treatment of Septic Total Hip Arthroplasty

CARL L. NELSON, M.D.

Professor and Chairman, University of Arkansas for Medical Sciences; Attending Orthopaedist, Central Baptist Hospital, Veterans Administration Hospital, Arkansas Children's Hospital, Little Rock, Arkansas.

Ender Nailing of Intertrochanteric Fractures

JAMES C. PARKES, II, M.D.

Associate Clinical Professor of Orthopedic Surgery, Columbia University School of Medicine; Associate Attending Surgeon, St. Luke's-Roosevelt Hospital; Assistant Attending Orthopedic Surgeon, Columbia-Presbyterian Hospital, New York, New York.

Conservative Management of Fractures of the Os Calcis

RICHARD H. ROTHMAN, M.D., Ph.D.

Professor and Director of Orthopacdic Surgery, University of Pennsylvania, Philadelphia, Pennsylvania.

Treatment of Herniated Lumbar Disc

CARTER ROWE, M.D.

Associate Clinical Professor Emeritus of Orthopaedic Surgery, Harvard Medical School, Cambridge, Massachusetts; Senior Surgeon, Massachusetts General Hospital, Boston, Massachusetts.

Treatment of Acromioclavicular Separations

ROBERT B. SALTER, O.C., M.D., M.S., F.R.C.S.(Can)

Professor and Head of Orthopaedic Surgery, University of Toronto; Senior Orthopaedic Surgeon, The Hospital for Sick Children, Toronto, Ontario, Canada.

Treatment of Legg-Perthes Disease

THOMAS L. SCHMIDT, M.D.

Assistant Professor of Medicine, Department of Orthopedic Surgery, University of Missouri at Kansas City; Director of Pediatric Orthopedic Surgery, Children's Mercy Hospital; Attending Staff, Department of Orthopedic Surgery, Truman Medical Center, Kansas City, Missouri.

Congenital Dislocation of the Hip.

THEODORE N. SILLER, M.D., F.R.C.S.(Can)

Lecturer, Department of Surgery, McGill University; Orthopaedic Surgeon, Shriners Hospital; Associate, Department of Orthopaedic Surgery, Reddy Memorial Hospital, Montreal, Quebec, Canada.

Treatment of Legg-Perthes Disease

I. S. SMILLIE, Ch.M., F.R.C.S.

Emeritus Professor of Orthopaedic Surgery, Honorary Research Fellow in Orthopaedic Surgery, University of Dundee, Scotland.

Meniscectomy

E. SHANNON STAUFFER, M.D.

Professor and Chairman, Division of Orthopaedic Surgery and Rehabilitation, Department of Surgery, Southern Illinois University School of Medicine; Attending Orthopaedic Staff Member, Memorial Medical Center, St. John's Hospital, Springfield, Illinois.

Thoracolumbar Fractures and Dislocations

ALFRED B. SWANSON, M.D.

Clinical Professor of Surgery, Michigan State University, Lansing, Michigan; Director, Orthopaedic Training Program, Blodgett and Butterworth Hospitals; Director, Hand Surgery Program, Director, Orthopaedic Research Department, Blodgett Memorial Medical Center, Grand Rapids, Michigan.

Arthroplasty of the Thumb Basal Joints

X Contributors

GENEVIEVE DE GROOT SWANSON, M.D.

Assistant Clinical Professor of Surgery, Michigan State University, Lansing, Michigan; Staff, Plastic and Reconstructive Surgery, Blodgett Memorial Medical Center, Grand Rapids, Michigan.

Arthroplasty of the Thumb Basal Joints

MARVIN TILE, M.D., B.Sc.(Med), F.R.C.S.(Can)

Associate Professor of Surgery, University of Toronto; Chief of Orthopedic Surgery, Sunnybrook Medical Center, Sunnybrook, New York.

Open Reduction of Tibial Fractures

F. WILLIAM WAGNER, JR., M.D.

Clinical Professor of Orthopaedic Surgery, School of Medicine, University of Southern California, Los Angeles, California; Chief, Ortho-Diabetes Service, Rancho Los Amigos Hospital, Downey, California; Chief, Ankle-Foot Service, Los Angeles County-University of Southern California Medical Center, Los Angeles, California; Attending Staff (Orthopaedic Surgery), Presbyterian Intercommunity Hospital, Whittier, California.

Ankle Fusion

THEODORE R. WAUGH, JR., M.D.

Walter A. L. Thompson Professor and Chairman, Department of Orthopaedics, New York University Medical Center, New York, New York.

Ankle Arthroplasty

MICHAEL J. WEBER, M.D.

Assistant Professor, University of Arkansas for Medical Sciences; Attending Orthopaedist, University of Arkansas for Medical Sciences, Arkansas Children's Hospital; Little Rock Veterans Administration Hospital, Doctors' Hospital, Little Rock, Arkansas.

Ender Nailing of Intertrochanteric Fractures

EDWIN T. WYMAN, JR., M.D.

Instructor in Orthopaedics, Harvard Medical School, Cambridge, Massachusetts; Associate Orthopaedic Surgeon; Chief, Fracture Service, Massachusetts General Hospital, Boston, Massachusetts.

Fixation of Intertrochanteric Fractures

FOREWORD

It is a great pleasure and honor to be able to write a Foreword to this most interesting publication. Controversies, or "a war of opinions whether in books or in pamphlets" (Chambers XX Century Dictionary) or "dispute/debate/argument" (Oxford Dictionary) is an excellent concept both for learning and, more importantly, for stimulating thinking and arousing curiosity. This is particularly true for the young orthopaedist in training or even for the more established orthopaedic surgeon who occasionally appreciates that all is not well with many of our prefixed ideas or practices. The editors have cleverly and carefully selected not only the more controversial or contentious subjects within orthopaedics but also the authors who are well known for their ability to argue for and against ideas. They have also held on well to the continuity of the content by well-placed and considerate editors' comments.

We have all heard, on the rare and fleeting occasion at some meeting, a lively and controversial dispute or debate between the speaker and the floor. This work will make a more permanent impact than this by allowing us to read and ponder over these controversies, which certainly are of concern and importance in the clinical practice of orthopaedics.

ROBERT DUTHIE

PREFACE

One attractive feature of orthopaedic surgery is the honest controversy engendered between members of the profession with regard to treating certain orthopaedic conditions. As new methods of treatment come into vogue each decade, they are matched against the record of the old standbys. Many readers will remember the debates heard in rounds and meetings throughout the orthopaedic community in the 1960s as we tried to evaluate hip arthrodesis, cup arthroplasty, osteotomy, and eventually total hip replacement as the solution to degenerative hip disease. These differences of opinion teach the younger practitioners and stimulate the elders. With that in mind, the editors of this volume have tried to choose subjects in which there could be honest controversy. These topics represent a variety of orthopaedic conditions and have not been aimed at one particular interest group. Each of the authors is recognized as an authority in the field about which he or she is writing and as an advocate of a specific treatment mode.

Our intent was to choose a number of subjects of general interest and have them debated by acknowledged experts in the field, thereby helping the reader to formulate his or her own treatment plan based upon two or more different points of view. Knowing in advance what each author would advocate for a particular condition, we felt that hard lines would be drawn between the adversaries on each side of the question. Orthopaedic surgeons are known to be contrary, and in this instance, the authors surprised the editors. Often, there was a meeting of orthopaedic minds and the realization that certain patients should be treated in one manner. Other times, we found no conflict, only simple differences of opinion, some major and others minor.

Controversies may occur because of a lack of basic knowledge of the disease process, ignorance of what can be accomplished by other methods of treatment or other disciplines, or one's own inability to deliver a specific type of therapy, such as a difficult surgical procedure. Solutions to controversies rest upon research and education. We often forget the role of education in minimizing orthopaedic complications and our obligation as doctors to educate others in the health field. If we communicate our knowledge and experience to our patients, nurses, therapists, and other colleagues, this knowledge, interpreted properly, may help many patients. If we are educated and skilled in both the surgical and the closed methods of treatment of fractures, unlike Procrustes, we can select that method of treatment applicable to each patient rather than matching the patient to our only treatment method.

We must avoid bias because of inadequate education or training. The purpose of this book is not only to alert the reader to alternative treatment methods but also to teach the advocated approach with which the reader's own logic will help in making treatment decisions. We must not be misled by the eloquent writing of these

xiii

XIV Preface

seasoned professionals we have chosen, but rather we should look at their reasoning based upon sound clinical or basic research studies.

Our principal thanks go to all of the authors who contributed their valuable time and expertise in writing this series of articles. To each of them, we give our sincere thanks for a job well done. We are also indebted to J. Drennan Lowell, M.D., and Mr. Brian Decker, who were in on the planning stage and did some of the original groundwork for this book. However, the lion's share of the credit in that regard must go to Mr. Carroll Cann, our editor from Saunders, who refused to leave us alone and whose patience plus a deft touch of steel discipline prodded us into finally realizing this project.

ROBERT E. LEACH FRANKLIN T. HOAGLUND EDWARD J. RISEBOROUGH

CONTENTS

DEGENERATIVE JOINT DISEASES

Chapter 1	
THE KNEE	
Editor's Comment	3
Robert Leach	
Tibial Osteotomy for Unicompartmental Osteoarthritis Donald B. Kettelkamp	5
Unicompartmental Knee Arthroplasty in Degenerative Arthritis Leonard Marmor	21
Chapter 2	
THE THUMB	
Editor's Comment	34
Arthroplasty of the Thumb Basal Joints	36
Arthrodesis of the Trapeziometacarpal Joint of the Thumb	58
Chapter 3	
THE ANKLE	
Editor's CommentFranklin T. Hoaglund	64
Ankle Arthroplasty	65
Theodore R. Waugh	
Ankle Fusion: "Ask the Man Who Owns One"	71
TORN MENISCUS	
Chantan	
Chapter 4 TORN MENISCUS	
Editor's Comment	85
Franklin T. Hoaglund	U
Meniscectomy: The Case for Total Excision	86

	Partial Meniscectomy	96
P	ROBLEM FRACTURES	
	Chapter 5	
	FEMORAL FRACTURES	
	Editor's Comment	03
	Robert Leach	
	Closed Intramedullary Nailing of the Femur with Reaming	105
	Nonoperative Care Using Functional Bracing for the	
	Fractured Femur	123
	Vert Mooney	
	Chapter 6	
	INTERTROCHANTERIC FRACTURES	
	Editor's Comment Robert Leach	137
	Ender Nailing of Intertrochanteric Fractures Carl L. Nelson Michael Weber Bo Bergman	139
	Michael Gerdes Fixation of Intertrochanteric Fractures Edwin T. Wyman, Jr.	154
	Closed Condylocephaic Nailing of Intertrochanteric	
	Fractures	69
	Chapter 7	
	TIBIAL FRACTURES	
	Editor's Comment	78
	The Nonoperative Early Weight-Bearing Treatment	
	of Tibial Shaft Fractures	80
	Paul W. Brown	
	Indications for Open Reduction of Tibial Fractures	200
	Chapter 8	
	FRACTURES OF THE OS CALCIS	
	Editor's Comment	228
	The Conservative Management of Fractures of	•
	the Os Calcis	229
	The Case for Operative Treatment of Fractures	
	of the Os Calcis	232

ACROMIOCLAVICULAR SEPARATION

Chapter 9	
ACROMIOCLAVICULAR SEPARATION	
Editor's Comment	,
Robert Leach	
Treatment of Acromioclavicular Injuries	1
Initial Treatment of Third Degree Acromioclavicular	
Separations	,
Carter R. Rowe	
The Nonoperative Technique for the Treatment of	
Acromioclavicular Injuries Utilizing the Kenny Howard	
Sling Halter 273	
Fred L. Allman, Jr.	
THE PEDIATRIC HIP	
Chapter 10	
LEGG-PERTHES DISEASE	
Editor's Comment	
Legg-Perthes Disease: Relevant Research and Its	
Application to Treatment	
A Defense of Femoral Osteotomy	
A. Catterall	
Cast Treatment of Legg-Perthes Disease	
Orthotic Management of Legg-Perthes Disease	
Chapter 11	
CONGENITAL DISLOCATIONS OF THE HIP	
Editor's Comment	
Edward J. Riseborough	
Treatment of Congenital Dislocation of the Hip	
Albert B. Ferguson, Jr.	
Congenital Dislocation of the Hip: Preferred Methods of	
Reduction in Children Under 18 Months of Age 345	
G. Dean MacEwen	
Thomas L. Schmidt	
TOTAL HIP REPLACEMENT	
· Chamter 12	
Chapter 12 TROCHANTERIC OSTEOTONIA	
TROCHANTERIC OSTEOTOMY	
Editor's Comment	

The Role of the Transtrochanteric Approach in
Arthroplasty of the Hip
Nas S. Eftekhar
Stephen J. McIlveen
The Greater Trochanter: To Osteotomize or Not?
Chapter 13
INFECTION IN TOTAL HIP REPLACEMENT
Editor's Comment
Treatment of the Established Deep Wound Infection After Total Hip Arthroplasty: A Report of 65 Cases
William R. Murray
Treatment of Septic Total Hip Arthroplasty by
Immediate Exchange with Antibiotic-Containing Cement
SPINAL SURGERY
Chapter 14
FRACTURE DISLOCATIONS OF THE SPINE
Editor's Comment
Fracture Dislocations of the Spine with and without
Paralysis: The Case for Conservatism and against
Operative Techniques
G. M. Bedbrook
Open Reduction and Internal Fixation of Unstable
Thoracolumbar Fractures and Dislocations
E. Shannon Stauffer
Chapter 15
HERNIATED DISC
Editor's Comment
In Defense of Spinal Fusion
H. F. Farfan
The Treatment of the Young Person with Uncomplicated
Herniated Lumbar Disc with Disc Excision Alone
Chapter 16
TUBERCULOSIS OF THE SPINE
Editor's Comment
Franklin T. Hoaglund
Surgical Treatment of Tuberculosis of the Spine
Arthur RHodgson
1s Your Operation Necessary?
Peter Konstam
INDEX

DEGENERATIVE JOINT DISEASES

THE KNEE

Editor's Comment

Robert Leach

TIBIAL OSTEOTOMY FOR UNICOMPARTMENTAL OSTEOARTHRITIS

Donald B. Kettelkamp

UNICOMPARTMENTAL KNEE ARTHROPLASTY IN DEGENERATIVE ARTHRITIS

Leonard Marmor

THE THUMB

EDITOR'S COMMENT

Robert Leach

ARTHROPLASTY OF THE THUMB BASAL JOINTS

Alfred B. Swanson Genevieve de Groot Swanson

ARTHRODESIS OF THE TRAPEZIOMETACARPAL JOINT OF THE THUMB

Norman A. Hill

THE ANKLE

EDITOR'S COMMENT
Franklin T. Hoaglund

ANKLE ARTHROPLASTY

Theodore R. Waugh

ANKLE FUSION: "ASK THE MAN WHO OWNS ONE"

F. William Wagner, Jr.