Surgical Treatment of Rheumatoid Arthritis

Thomas P. Sculco

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Surgical Treatment of Rheumatoid Arthritis

This text is dedicated to the many patients I have cared for afflicted with rheumatoid arthritis. From their courage and perseverance we as physicians gain strength to strive continually to solve and unravel the mysteries of this disabling disease.

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Foreword

Rheumatoid arthritis is a complex disease of many presentations. It may truly be the "Great Imitator" in our collection of painful inflammatory chronic diseases. Painful swollen joints, one or many, acute or chronic, may be tuberculous or gout or even luetic. These conditions may look alike clinically. These and other diseases, as well as trauma and stress, may be borne in mind when considering a differential diagnosis. Rheumatoid arthritis is a disastrous disease both personally and nationally in economic loss.

The course of disease in rheumatoid arthritis is unpredictable. It may remain at low levels for many years, or may progress rapidly in spite of therapy. Thirty years ago we followed a patient who suffered from severe juvenile rheumatoid arthritis. She had complete ankylosis of both elbows and serious limitation of motion in both knees. She had not been outside her apartment for about 10 years, spoke no English, and knew no trade. In a prolonged hospital stay, a carefully planned program included arthroplasties with her own fascia lata to both elbows and osteotomies to straighten both knees. During each operative period, the patient received intensive physical therapy for strength and walking (the first time she had walked). During her entire hospital stay, this intelligent young woman received occupational therapy, learning to be a seamstress of children's clothes and doll dresses. During this year she also learned to read, write, and converse in English. After leaving the hospital, she provided partial self-support doing work at home with her sewing. She was able to leave her apartment with assistance and lives now with limited family support. I tell this patient's story to illustrate the importance of treating the rheumatoid patient in a comprehensive manner. There is truth to the statement, "Surgery alone will not cure rheumatoid arthritis." This patient had a comfortable, though limited, lifestyle for about 7 years. She then noticed a gradual recurrence of her disease; pain and swelling of knees and elbows leading to dislocation, and further reconstructive surgery and intensive medical treatment allowed improved function again.

Dr. Richard Freyberg came from the University of Michigan to the Hospital for Special Surgery in 1944 as Chief of Rheumatic Diseases. He brought a great stimulus to both clinical and laboratory research. For years there had been a medically-oriented "Arthritis" clinic, as Dr. James Knight, who founded the Hospital for the Relief of Ruptured and Crippled (The R & C; changed to Hospital for Special Surgery in 1940), was an internist and was opposed to surgery.

Dr. Freyberg arrived at a very crowded HSS and was forced to share private offices and examination rooms with me. This proved to be most enjoyable, for proximity led to ready consultation and better evaluation and care. Our discussions led eventually to the formation of a special consultative arthritis clinic and conference staffed by internists, orthopaedic surgeons, rheumatologists, nurses, physical therapists, occupational therapists, medical students, and interested staff. This was named the "Comprehensive Arthritis Program" [C.A.P.], covering a separate clinic, scheduled operative time and case presentation conference. The regular arthritis clinics and conferences now continue manned by the same research-clinician group. A review of the chapter titles in this book shows the study areas in this program. It can hardly cover the value of the tissues made available to research. Nor can the value of the numerous informal personal ideas and discussions stimulated by this combined program be recorded. It is hoped that careful evaluation of all therapeutic techniques, medical and surgical, will lead to great improvement in the treatment of this miserable disease.

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Foreword

In 1969 to 1970, together with a number of other rheumatology research fellows, I followed my chief, Dr Charles Christian from Presbyterian Hospital in New York City, to the Hospital for Special Surgery where he assumed the role of Physician-in-Chief. The immediate impression of this hospital was one of enormous team spirit—at every level and in every department. It was an impression which my colleagues shared and which has remained with me.

At a clinical level, this spirit produced results which have been admired and emulated worldwide. It is almost universally accepted that a combined approach to patients with long-term and complex diseases such as rheumatoid arthritis pays dividends. In practice, however, this combined approach frequently falters. Orthopaedic surgeons are, and must always be, pragmatists. Rheumatologists, dealing with less-than-perfect treatments, with chronic pain, and with small successes, are doubters. On the face of it, the two specialties sit together uncomfortably.

In practice, the combination of these specialties has, in certain groups of patients, resulted in real improvements in patient care.

That combined—even multidisciplinary—clinics are now accepted worldwide is, in large part, due to the pioneering work of a small number of centers, one of which was, and is, the Hospital for Special Surgery.

In this volume, Dr. Tom Sculco has brought in many colleagues from HSS's well-known Comprehensive Arthritis Program to provide a uniquely experienced overview of the surgical management of rheumatoid arthritis.

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Preface

Rheumatoid arthritis remains an unsolved disease. Despite extensive and continued research its etiology remains unclear. The disease itself manifests a varied spectrum of clinical presentation from a transient oligoarticular disease pattern to a rapidly devastating polyarthritis with severely impaired upper and lower extremity function. The clinician must also be aware of the severe extraskeletal components of the disease which can lead to cardiopulmonary, renal, and ocular complications. In fact, rheumatoid arthritis may be a generic name for a wide spectrum of diseases with varying presentations which are all labelled under the general umbrella of rheumatoid arthritis.

The disease has its predilection for children and adults in their early years. Because of its skewed incidence in young women, it may be particularly disruptive to a young family. The economic impact of the disease is considerable both because of the chronic need for medical and surgical care and the lost income by the affected patients during their most productive years. Children afflicted with the disease require the most complex medical care and familial support, and may never be able to function in society in a successful manner.

The severity of the disease and its multifaceted character require that these patients be cared for in a comprehensive fashion. Comprehensive implies a multidisciplinary approach to the clinical, social, and psychologic aspects of the disease, and that solutions are developed in a collaborative manner. Clinical input is important from rheumatologist, nurse, physical and occupational therapist, social worker, orthopaedic surgeon, and at times psychiatrist. At the Hospital for Special Surgery this is carried out in a combined service, the Surgical Arthritis Service (formerly the Comprehensive Arthritis Program). Patients with rheumatoid arthritis are presented in a combined forum with input from all subspecialties. A treatment plan is then developed and effected with the same clinical team following the patient as they become in-patients. When in-patient care is completed patients are returned to the outpatient setting and cared for by the same health team. This not only ensures a complete evaluation and treatment plan to the patients but continuity of care is possible because the same clinical team follows the patient in the ambulatory and in-patient setting.

This text emphasizes this comprehensive, collaborative approach to rheumatoid arthritis. The first part of the book concentrates on the medical treatment of the disease with its pathologic and radiologic features. The latter part of the text addresses the nonsurgical and surgical treatment by anatomic area. A thorough rehabilitation section is also provided to detail the modalities available for the rheumatoid patient in the outpatient setting and as part of the recovery process after reconstructive surgery.

A text which encompasses this broad topic cannot be completed without the help of many individuals. Firstly, my gratitude to my co-authors and colleagues who labored so hard to meet deadlines and put up with many harassing calls and messages. Hopefully a current and much needed text on rheumatoid arthritis makes the task well worth it. Joyce-Rachel John at Mosby–Year Book, Inc. deserves particular recognition for keeping the book moving in a prodding but pleasant way. Also much thanks to Jim Ryan, also of Mosby–Year Book, Inc., who was there when the final push was needed. My family saw less of me during the past year and I especially owe a debt of gratitude to them. And finally (so this does not sound like an Oscar acceptance speech), to Joel Herring, the illustrator who kept a close schedule and was always available, especially down the home stretch.

THOMAS P. SCULCO, M.D.

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PART I

General Considerations

CHAPTER 1

Medical Concepts and Treatment in Rheumatoid Arthritis

Charles L. Christian, M.D.

Thomas J. A. Lehman, M.D.

CHAPTER 1A

Adult Rheumatoid Arthritis

Charles L. Christian, M.D.

INTRODUCTION

The term *rheumatoid arthritis* (RA) first appeared in an 1859 communication by Alfred Baring Garrod; from his experience he described a syndrome that seemed to him distinct from gout and rheumatism (acute rheumatic fever). Except for inclusion of inflammatory Heberden's nodes, his description, by and large, fits modern concepts of RA. The syndrome is more complex than clinical synovitis, in most patients systemic manifestations are prominent, and in some subjects morbidity relates more to extraarticular involvement than to joint disease. For a comprehensive and reasonably contemporary review of RA, readers are referred to a textbook.[12]

Rheumatoid arthritis is relatively common—the incidence in most populations is in the range of 1% to 2%,—it affects all ages, and is more common in women than men (epidemiologic studies suggest that the incidence of RA may be decreasing[6]). There are genetic markers that identify persons with higher than normal risk for development of RA. Concordance for disease is observed in 50% or more of monozygotic twin pairs. Pathologic changes reflect the full range of multiple cellular and humoral factors mediating inflammation. Etiologic stimuli have not been identified but immunologic mechanisms are clearly implicated in pathogenesis.

Rheumatoid arthritis as currently defined is a strikingly diverse syndrome; some of the variables that characterize subsets are summarized in Table 1A–1. Classifications have taken into consideration: the presence or absence of rheumatoid factor (seropositive vs. seronegative RA); major histocompatibility complex (MHC) class I and II markers (HLA-B27, HLA-DR4, etc.), anatomic variations (polyarticular vs. pauciarticular, ankylosing vs. subluxing patterns, symmetric vs. asymmetric); the presence or absence of nodules, vasculitis, and other extraarticular manifestations; and the synovial histologic findings (presence or absence of lymphoid features). The clinical heterogeneity may reflect multiple etiologies or, alternatively, varied host responses to a single or restricted range of etiologies.

PATHOLOGY

Lesions of articular cartilage, bones, and periarticular tissues in RA are related to the generation of a hyperplastic synovium (pannus) which, via collagenase and other hydrolytic enzymes, can degrade these tissues. In addition, there is a wide range of humoral events that may mediate injury of connective tissue substrates. They include: (1) release of vasoactive amines; (2) generation of enzymes from plasma substrates or from cells that affect tone and permeability of blood vessels, and promote blood coagulation or fibrinolysis; (3) activation of complement, yielding chemotactic, anaphylactic, and cytotoxic principles; (4) production of prostaglandins and leukotrienes via the action of enzymes on arachidonic acid; (5) formation of oxygen-derived products; (6) release of lysosomal enzymes from inflammatory cells; and (7) the synthesis and release of numerous cytokines (e.g., interleukins, growth factors, tumor necrosis factor).

Granulocytes predominate in RA synovial fluid but the cellular composition of hyperplastic synovial tissues is complex and varied. It includes fibroblastic cells, macrophages, endothelial cells, lymphocytes, plasmacytes, and mast cells. Aggregates of T lym-