

PERIODONTAL PROSTHESIS

SAUL M. HIRSHBERG, D.M.D., F.A.C.D.

*Associate Clinical Professor
Department of Restorative Dentistry
Tufts University, School of Dental Medicine*

With a Foreword by

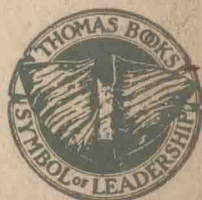
ALVIN F. GARDNER, D.D.S., M.S., Ph.D.

*Bureau of Medicine
Food and Drug Administration
Washington, D.C.*

PERIODONTAL PROSTHESIS presents new concepts in the advanced prosthetic treatment of periodontal patients, placing emphasis on economy of time and cost in treatment planning, preparation of the abutment teeth, and preparation of the periodontal tissues prior to prosthesis.

Several important chapters deal with areas of periodontal prosthesis not usually described: the orthodontic considerations prior to prosthesis, the orthodontic methods of treatment, the present status of implants in periodontal prosthesis, and the monetary management of a restorative practice.

American Lecture Series®



L 0 14

PERIODONTAL PROSTHESIS

By

SAUL M. HIRSHBERG, D.M.D., F.A.C.D.

Associate Clinical Professor

Department of Restorative Dentistry

Tufts University, School of Dental Medicine

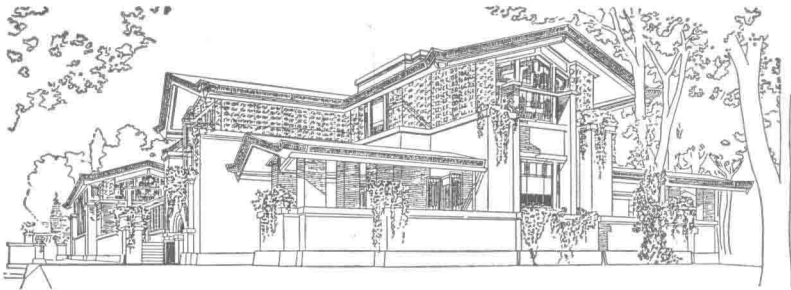
With a Foreword by

Alvin F. Gardner, D.D.S., M.S., Ph.D.

Bureau of Medicine

Food and Drug Administration

Washington, D.C.



CHARLES C THOMAS • PUBLISHER
Springfield • Illinois • U.S.A.

Published and Distributed Throughout the World by
CHARLES C THOMAS • PUBLISHER
BANNERSTONE HOUSE
301-327 East Lawrence Avenue, Springfield, Illinois, U.S.A.

This book is protected by copyright. No part of it
may be reproduced in any manner without written
permission from the publisher.

© 1977, by CHARLES C THOMAS • PUBLISHER
ISBN 0-398-03605-5
Library of Congress Catalog Card Number: 76-25819

*With THOMAS BOOKS careful attention is given to all details of
manufacturing and design. It is the Publisher's desire to present
books that are satisfactory as to their physical qualities and artistic
possibilities and appropriate for their particular use. THOMAS
BOOKS will be true to those laws of quality that assure a good
name and good will.*

Printed in the United States of America
N-11

Library of Congress Cataloging in Publication Data

Hirshberg, Saul M.

Periodontal prosthesis.

(American lecture series).

Bibliography: p.

Includes index.

1. Periodontal prosthesis. I. Title. [DNLM: 1. Periodontal pros-
thesis. WU240 H669p]

RK668.H57

617.6'32

76-25819

ISBN 0-398-03605-5

DEDICATION

*to my wife, Joyce, whose constant love and
support enabled me to complete this book
and*

*to the late Dr. Irving Glickman, Professor of
Periodontology, Tufts University, School of Dental
Medicine, who inspired in me the study of perio-
dental prosthesis.*

CONTRIBUTORS

MURRAY BERNSTEIN, D.M.D., M.S., F.A.C.D. Clinical Professor of Orthodontics, Director of Clinical Orthodontics, Boston University School of Graduate Dentistry.

Diplomate, American Board of Orthodontics.

MILTON M. DINES, D.D.S., F.R.C.D. (C.) Assistant Clinical Professor, Department of Periodontology, Tufts University School of Dental Medicine. Associate Clinical Professor, Department of Periodontology, Forsyth Dental Center, School of Dental Hygiene.

SUMNER H. WILLENS, D.M.D., F.A.C.D., F.A.G.D. Assistant Clinical Professor, Department of Restorative Dentistry, Tufts University, School of Dental Medicine.

FOREWORD

THE *American Lectures in Dentistry* series advances newer knowledge for progress of dental practice. Success in modern dental practice is dependent upon biologic as well as mechanical considerations. The interdependence of dentistry on oral biology is so great that dentists are turning to oral biologists and oral biologists to dentists in order to understand the local and systemic basis of oral disease. The oral biologic processes are currently becoming sound foundations for clinical dentistry resulting in a rather rapid extension of postgraduate instruction. Therefore, each of the books in this series unravels the oral mechanisms and provides the clinical management of many problems which have existed for decades.

The *American Lectures in Dentistry* series is charged with a striving ardor of dental wisdom, prepared *de rigueur* by the highly qualified oral *Wissenschaftler*. New insights and *Entscheidungsproblem* are discussed by distinguished dental colleagues. A tradition will be established of offering the dental practitioner comprehensive surveys of recent developments in the various fields of clinical dentistry while presenting self-contained independent presentations directed to the general practitioner and specialist. This series is charged with providing the most current concepts in developing the continuing education for the dental practitioner.

The *American Lectures in Dentistry* series is based upon the following principles: concern, conviction, competence, commitment and courage. The series will show concern for numerous dental problems, have a conviction that dental problems can be solved, have competence that this series can contribute to their solution, have a commitment of time and energy in the search for answers, and have the courage to take the necessary action to present solutions to various dental problems.

Dentistry is both a science and an art which fulfills a social function. This series will, therefore, encompass clinical, oral biologic and social topics which are most applicable to the general practitioner of dentistry. It is our hope that the efforts of the contributors will assist the dental practitioner in fulfilling his responsibility to his patients through sound judgments, proper technical knowledge, and dispatch. The *American Lectures in Dentistry* will serve as extremely practical references to aid the dental practitioner to resolve some of the problems encountered in the practice of dentistry as well as to broaden the horizons of those progressive dentists who desire the postgraduate knowledge and continuing education presented in

this series. Contributors will focus attention on those aspects of dental practice causing the general practitioner the greatest concern and difficulty. The contributors of this series will help the practicing dentist to meet the challenges of the various phases of dental practice. Their observations should be beneficial to dentists seeking to attain the best possible treatment for their patients. New oral diagnostic problems, techniques, instrumentation and therapeutic measures are emerging. It is hoped that a tradition will develop whereby the *American Lectures in Dentistry* serves the dental practitioner and dental specialist alike.

Continuing education is dependent upon communicating the newer concepts in dentistry to the dental practitioner. It is hoped that this series will provide the important link of communication and result in better patient care. The continued quest for newer knowledge is the responsibility of the dental practitioner. This series will attempt to put the written current concepts into actual dental practice and therefore combat obsolescence. The editor and publisher are interested in encouraging the correlation of oral biologic principles with the clinical problems encountered by the dental practitioner who will base all his therapy on sound biologic concepts. The undergraduate education of a dental practitioner includes, in part, the development of his knowledge and skills. The continuing education of a dental practitioner includes the further development of his knowledge and skills by means of advanced educational programs which have a profound influence on the services performed by the dental practitioner. This series is predicated on the concept that continuing dental education is no longer confined to a selected few, but rather is a requirement for every present and future member of the dental profession.

There are dramatic changes taking place in dental care which will influence the future of dental practice. The unprecedented growth of scientific knowledge now is being applied to dentistry which is due to create tremendous changes in the art and science of dentistry.

It is not humanly possible to assimilate all of the knowledge in dental school that will be needed for the practice of dentistry. In addition, new knowledge is increasing at a rapid rate. Therefore, the dental practitioner can only keep abreast of the times by showing an initiative for self-learning. It is our hope that the *American Lectures in Dentistry* will stimulate the inquiring mind and provide the dental practitioner with a foundation in basic and new knowledge, skills and attitudes of dentistry upon which he can prepare himself for dental practice in current and future years.

The modern-day dental practitioner is in need of every opportunity possible to extend his knowledge and clinical experience. It is the purpose of the *American Lectures in Dentistry* series to represent one kind of continuing education which will be readily available to him. The *American*

Lectures in Dentistry series places emphasis upon the fact that dental knowledge is not a rigid, fully elaborated system of facts, but rather one that is dynamic and constantly changing as new facets of knowledge are developed into the mosaic pattern of the whole.

Dr. Saul M. Hirshberg, Associate Clinical Professor, Department of Restorative Dentistry, School of Dental Medicine, Tufts University, Boston, Massachusetts, presents this postgraduate treatise on periodontal prosthesis. It is, of course, extremely difficult for the practicing dentist to keep abreast of the ever-changing flow of information on periodontal prosthesis. It is hoped that the up-to-date information presented in this treatise by the author will greatly assist the dentist in his endeavor to provide the best possible therapy for his patients. Written by a distinguished teacher and clinician, this book represents the fruition of the editor's plans to bring postgraduate dentistry within the reach of all general practitioners of dentistry. The author and contributors have provided material which bears directly on the dental care of patients, and no greater achievement could be asked. The material presented in this treatise is directly applicable to the oral care of patients, contributing to improved diagnosis, management or treatment.

The author writes with the authority of earnest study and wide clinical and teaching experience. The material he discusses has been chosen deliberately to cover many areas of interest to the practicing dentist and is truly a postgraduate education for the modern general practitioner.

The editor of this series is grateful to the author and contributors for their cooperation in bringing to the practicing dentist the results of their years of training, teaching and experience.

ALVIN F. GARDNER, D.D.S., M.S., PH.D.
Editor
American Lectures in Dentistry

PREFACE

THE MOST IMPORTANT subject matter presented to the dental profession concerns the preservation of the natural dentition. This is our goal as dental practitioners. When the interrelations of periodontics and prosthodontics are properly considered we can assure this goal for our patients.

What is periodontal prosthesis? A useful definition is any dental procedure that involves restoring a tooth to usefulness in the dental arch. Thus a Class I amalgam would satisfy the definition as would a full mouth reconstruction.

Keeping the above definition in mind, this book shall consider the prognosis of individual as well as groups of teeth in the overall diagnostic plan from a periodontal, prosthodontic, endodontic and orthodontic viewpoint. The concept of conformative periodontal prosthesis rehabilitation utilizing the patient's present dental status shall be fully explored. Within this concept various types of abutment retainers, pontics, embrasures and occlusion that maintain optimal gingival health shall be covered in depth.

SAUL M. HIRSHBERG

CONTENTS

	<i>Page</i>
<i>Foreword</i>	ix
<i>Preface</i>	xiii
 <i>Chapter</i>	
1 DIAGNOSIS AND PROGNOSIS	<i>Saul M. Hirshberg</i> 3
2 UTILIZATION OF QUESTIONABLE ABUTMENT TEETH	<i>Saul M. Hirshberg</i> 7
3 CONFORMATIVE DENTISTRY	<i>Saul M. Hirshberg</i> 46
4 THE PHYSIOLOGICAL FULL CROWN	<i>Saul M. Hirshberg</i> 68
5 PONTICS AND EMBRASURES	<i>Saul M. Hirshberg</i> 90
6 THE ROLE OF IMPLANTS IN PERIODONTAL PROSTHESIS	<i>Saul M. Hirshberg</i> 100
7 TEMPORIZATION	<i>Sumner H. Willens</i> 112
8 SOME SPECIAL CONSIDERATIONS IN PERIODONTAL PREPARATION FOR PROSTHESIS	<i>Milton M. Dines</i> 129
9 ORTHODONTICS IN PERIODONTAL PROSTHESIS	<i>Murray Bernstein</i> 153
10 MONETARY MANAGEMENT IN PERIODONTAL PROSTHESIS	<i>Saul M. Hirshberg</i> 215
 <i>Index</i>	 225

PERIODONTAL PROSTHESIS

Diagnosis and Prognosis

SAUL M. HIRSHBERG, D.M.D., F.A.C.D.

UNFORTUNATELY there is no magic formula when evaluating an abutment tooth. However there is a series of questions that are useful when making a decision about these important teeth. The first and most important question is used at the beginning and the completion of the treatment plan.

How vital is this tooth to the overall plan of treatment? If the answer is most vital, treatment might then include cross-arch splinting, hemisection or adjunctive dental implants. However, if there are other teeth that can accept the abutment responsibility, it might be wise to extract a tooth with a poor prognosis. Any periodontal prosthesis is as good as its weakest abutment, not its strongest. It is far better to have a healthy pontic for a neighbor than a chronically ill abutment tooth.

There are many instances where extraordinary clinical procedures should be undertaken to preserve a possible abutment tooth that may be used for a potential fixed rather than removable prosthesis. Since any fixed appliance is a stabilizing influence while a removable appliance is a displacing one, the most posterior tooth becomes a very important factor in the preservation of the entire periodontal prosthesis. Many times the addition of a dental implant as a supporting beam can aid in the retention of a posterior tooth by redistributing some of the occlusal and lateral forces.

How long has this tooth been seriously involved? This is very important to the longevity of a periodontal prosthesis. If the degree of involvement has been static for a number of years, the prognosis for the use of this tooth as an abutment retainer is good.

How radically can the environment of the tooth be changed? The most important consideration lies in the evaluation of the response of the alveolar bone to local factors in the oral cavity. If a poor occlusion can be improved (Fig. 1-1), local irritants removed, some adjoining healthy teeth splinted, and better oral physiotherapy followed, the scale may be balanced in favor of retaining the tooth. The fewer the changes that can be made, the poorer the prognosis.

How much bone loss is present? If the tooth and the surrounding tissues

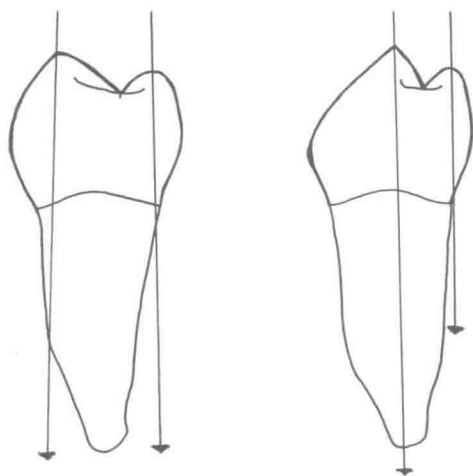


Figure 1-1. Schematic representation of an improved occlusion. The occlusal table has been narrowed, changing the cusp-fossa relationship to a more favorable one. Note the change in force from the torquing position on the left to a more stable force along the long axis of the root on the right.

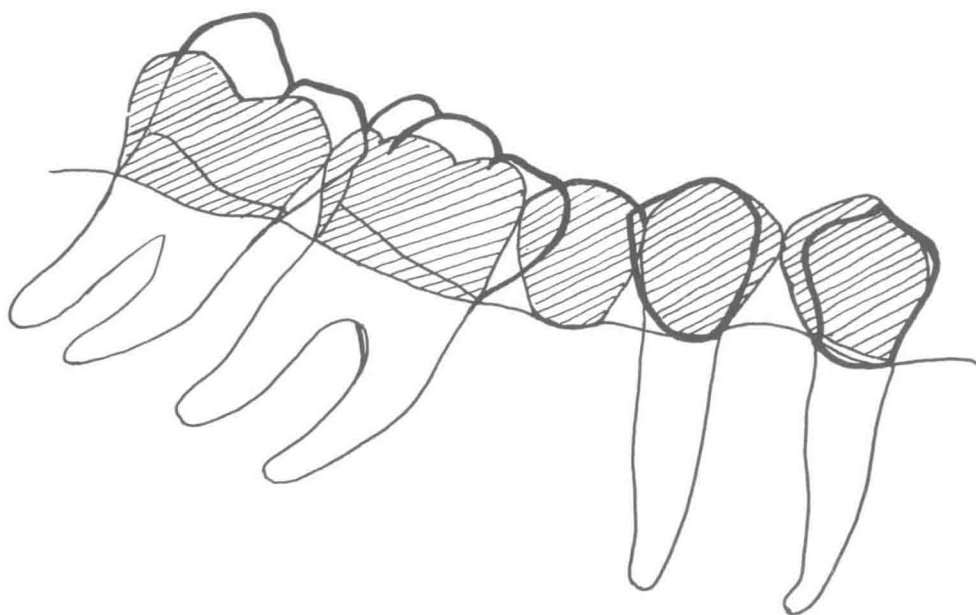


Figure 1-2. A diagrammatic representation of changes in the shapes of crowns (shaded areas) with a resultant preferred crown-root ratio. The plane of occlusion is also greatly improved by the changes made in crown shape. (Darkest lines represent previous position and shape of teeth.)

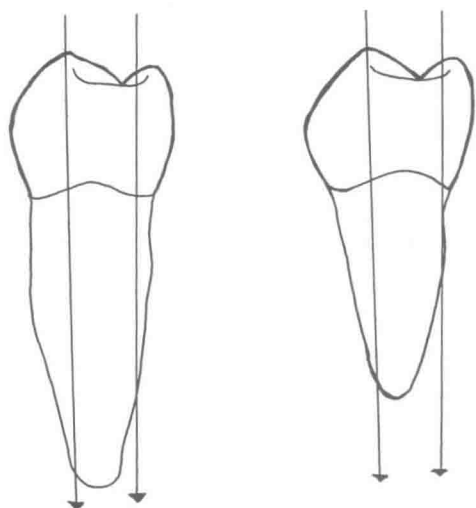


Figure 1-3. Note the length of the force line within the long root by comparison with the shorter root.

can be returned to good health, a small percentage of the normal bone level may be sufficient.

Can the crown-root ratio be modified? Usually significant changes in the shape of the crown can be made with a resultant shorter crown-root surface (Fig. 1-2). The shape of the abutment root also alters the prognosis (Fig. 1-3). Club-shaped rather than spindly roots favor tooth retention. The larger the amount of tooth structure with periodontal fiber attachments, the better the prognosis.

How mobile is the prospective abutment? Mobility is directly related to many of the previous questions. If there is a possibility of stabilization and return of the tissues to health, then the mobility may not be a great problem. However, the more mobile a tooth, the poorer the prognosis.

What is the age of the patient? Contrary to most diseases, the older the patient the better the prognosis (Fig. 1-4).

Is suppuration present? Unless the other answers to our questions are unfavorable, suppuration per se is just one more symptom of the periodontal disease which must be arrested before prosthesis is attempted.

Is a systemic factor involved in the prognosis? A thorough medical history must be evaluated in order to eliminate the possibility of untreated systemic disease. Otherwise the prognosis is poor.

How much experience has the operator and how much cooperation can we expect from the patient? Self-evaluation is perhaps the most difficult

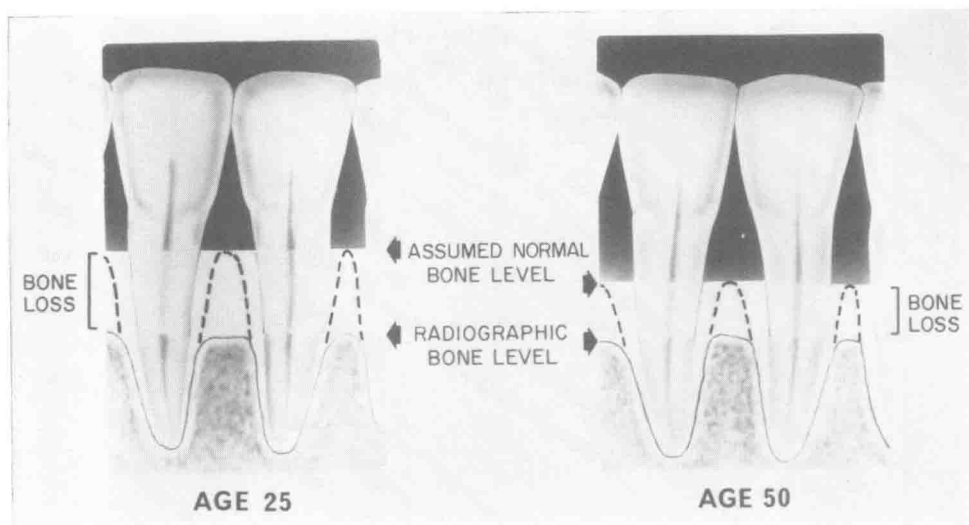


Figure 1-4. From Glickman, Irving, *Clinical Periodontology*, first edition 1953, Courtesy of W. B. Saunders Co., Philadelphia.

challenge of restorative dentistry. An abutment should not be prepared if the practitioner cannot control the periodontal disease, the laboratory phase, and the overall planning of the perioprosthetic prosthesis.

Likewise the practitioner must evaluate the patient from a psychological viewpoint. Great changes in the patient's habits at the age when perioprosthetic prosthesis are required are most difficult when attempted by a restorative dentist. The motivation of the patient should be carefully analyzed before starting the prosthesis. If prevention control is successful with the patient, the prognosis for individual abutments improves.

At this point in the examination the initial question can more successfully be evaluated. *Is this tooth vital to the overall treatment plan?*

When the prosthesis is completed and the abutment teeth are evaluated over the years, the type of response from the periodontal tissues is the most important criteria in determining whether or not a proper diagnosis and prognosis were originally made.

SUGGESTED READINGS

1. Ante, I.H.: The fundamental principles of abutments. *Mich. State Dent. Soc Bull*, 8:14, 1926
2. Brehm, T.W.: Diagnosis and treatment planning for fixed prosthesis. *J. Prosthet. Dent.*, 30:876, 1973.
3. Glickman, I.: *Clinical Periodontology*, 4th ed. Philadelphia, W.B. Saunders Co., 1972, pp. 523-530.

4. Johnston, J.F., Phillips, R.W., and Dykema, R.W.: *Modern Practice in Crown and Bridge Prosthodontics*, 3rd ed., Philadelphia, W.B. Saunders Co., 1971.
5. Kay, S., Forscher, B.K., and Sackett, L.M.: Tooth root length-volume relationships. An aid to periodontal prognosis. I. Anterior teeth. *Oral Surg., Oral Med., & Oral Path.*, 7:735, 1954.
6. Morris, M.L.: Healing of human periodontal tissues following surgical detachment and expiration of vital pulps. *J Periodont.*, 31:23, 1960.
7. Morris, M.L.: The diagnosis, prognosis and treatment of the loose tooth. *Oral Surg., Oral Med., & Oral Path.*, 6:1037, 1953.
8. Schulte, W.: Limitations of periodontal therapy due to systemic factors. *Deutsche Zahnarzt. Zeitschr.*, 24:41, 1966.
9. Slatten, R.W.: An evaluation of factors determining prognosis in inflammatory and retrogressive periodontal disease. A. Series. *J. Periodont.*, 25:30, 1954.
10. Tylman, S.D. and Tylman, S.G.: *Theory and Practice of Crown and Bridge Prosthodontics*, 6th ed. St. Louis, C.V. Mosby Co., 1970.
11. Wilson, W.H. and Lang, R.L.: *Practical Crown and Bridge Prosthodontics*, New York, McGraw-Hill Book Co., 1962.