



IN THE NAME OF ALLAH  
MOST GRACIOUS, MOST MERCIFUL



# Temporal Bone Dissection Manual



**Abdulrahman A. Hagr**

MBBS, FRCS

Director of Temporal Bone KSU

Associate Professor/Consultant

Director of Research Chair for Hearing Disability

**Abdulrahman A. Al-Sanosi**

MBBS, KSUF, AB

Associate Professor/Consultant

Chairman, Cochlear Implant Unit



Academic Publishing and Press, King Saud University

P.O. Box 68953, Riyadh 11537, Saudi Arabia

© King Saud University, 2012

***King Fahd National Library Cataloging-in-Publication Data***

King Saud University, Department of Documentation and Government  
Publications  
Temporal bone dissection manual. / Department of Documentation  
and Government Publications .– Riyadh, 2012

115 p., 21 x 28 cm

ISBN: 978-603-507-016-4

1- Temporal bone – Surgery

I- Title

617.84 dc

1433/4623

**Legal Deposit No. 1433/4623**

**ISBN: 978-603-507-016-4**

This book has been refereed by a specialized committee appointed by the Academic Council of the University. After the reports of the referees, the Council authorized its publication in its 5th session of the academic year 1432/1433H., which was convened on 17-12-1432H. (13-11-2011)



Academic Publishing and Press, 2012

## FOREWORD

The temporal bone is a complicated and often terrifying structure to otologists in training, particularly when it is first encountered. So much anatomy, with so many critical structures is packed into such a small space. The consequences of being lost by even a few millimeters can be devastating for the patient. It is understandable that there is a real “psychologic” hurdle to be overcome before gaining confidence with the temporal bone.

Not only the anatomy, but the instruments, the operating room procedures, and the radiology used in otology can conspire to make the whole area difficult and arcane. Hence, it is really important to have a road map to guide the way, and at least begin the initial orientation for students starting out in this area. I think this kind of introductory map has to be relatively simple, didactic, and high level and this book provides that very well.

Dr. Hagr spent a year with us at Dalhousie University, and I am pleased to see that he has absorbed and embellished many of the teaching tools that we have used here successfully for years, and developed several more with Dr. Sanosi, as shown in this book. Drs. Hagr and Sanosi have done an admirable job in trying to present a comprehensive introduction to the temporal bone, and its assessment and treatment. They have covered most of the areas of confusion for most beginning students, and tried to provide simple rules to “hang” more complicated facts on, and for early orientation.

There is a very strong need for this kind of book, and I think Temporal Bone Dissection course organizers will be happy to have another option to help guide their students effectively.

Manohar Bance, MB, MSc, FRCSC  
Professor and Acting Head, Division Otolaryngology  
Dalhousie University, Halifax, Nova Scotia, Canada



## ACKNOWLEDGEMENT

Working on a manual is indeed a tough job but through the words of encouragement and constructive criticism from our visiting doctors, Prof. Lokman Bin Saim (Malaysia), Dr. David Peter Morris (Canada), Dr. Laila Telmesani, Dr. Munahi Al-Qahtani; the burden of such a load was lightened. We are most grateful!

We would like to acknowledge Dalhousie University Ear & Auditory Research Laboratory (E.A.R. Lab), Canada for providing us with beautiful pictures we used in this manual and the approach to temporal bone CT particularly to Dr. Morris, Dr. Bance and Rene Van Wijhe.

Thanks to the candidates of the 29th Temporal Bone Surgical Dissection Course for your feedback. We hope this manual will be of benefit to all future participants.

To all our friends we want to share with you the triumphs of our labor and hope we are able to advance the quality of temporal bone teaching in our own simple way.

And most of all, to Allah whom we owe this great life, we offer You this meaningful book.

THE AUTHORS





## INTRODUCTION

This manual is written for the otologist in training. It is not our intention to write an exhaustive account, but to provide practical notes that will complement your experience in our temporal bone laboratory.

This project was graciously funded through the Research Chair for Hearing Disability program. We hope that our effort will honor this generosity and serve to advance surgical skills which will improve surgical competency and lead ultimately to improve patient care.



## TABLE OF CONTENTS

<b>Foreword</b> .....	v
<b>Acknowledgement</b> .....	vii
<b>Introduction</b> .....	ix
<b>Chapter I: Surface Anatomy and Orientation</b> .....	1
The Lateral Surface of a Left Temporal Bone .....	2
The Superior Surface .....	3
The Posterior Surface .....	5
The Inferior Surface .....	6
The Anterior Surface .....	7
<b>Chapter II: Anatomy of the Middle Ear</b> .....	9
Ossicular Chain .....	11
Ligaments .....	13
The Eustachian Tube .....	16
<b>Chapter III: Basic Surgical Skills</b> .....	17
Color Recognition .....	17
The Drilling .....	19
Suction Irrigation .....	20
Hemeostasis .....	20
<b>Chapter IV: Canaloplasty</b> .....	21
Surgical Steps .....	21
<b>Chapter V: Meatoplasty</b> .....	23
Rationale .....	23
Goals .....	23
Surgical Steps .....	23
<b>Chapter VI: Cortical Mastoidectomy</b> .....	25

Table of Contents

<b>Chapter VII: Canal Wall-up Combined Approach Tympanomastoidectomy</b> .....	31
<b>Chapter VIII: Modified Radical Mastoidectomy</b> .....	35
Indications .....	35
Surgical Principles of Open Cavity .....	35
Surgical Steps .....	36
Removal of Mastoid Tip.....	37
The Advantages of Inside-out Approach .....	38
The Disadvantages of Inside-out Approach .....	38
<b>Chapter IX: Ossicular Chain Reconstructions (OCR)</b> .....	39
Important Factors for Successful Ossiculoplasty.....	40
<b>Chapter X: Endolymphatic Sac Surgery</b> .....	41
<b>Chapter XI: Labyrinthectomy</b> .....	43
Identification of the Internal Auditory Canal.....	45
<b>Chapter XII: Translabyrinthine Approach to the CPA</b> .....	49
Advantages .....	49
Disadvantages .....	49
Indications .....	49
Surgical Steps .....	49
<b>Chapter XIII: Cochlear Implant</b> .....	53
Indications .....	53
Surgical Steps .....	53
<b>Chapter XIV: Bone-Anchored Hearing Aid (BAHA)</b> .....	57
<b>Chapter XV: CT Scan of the Temporal Bone</b> .....	59
<b>Chapter XVI: Temporal Bone Instruments</b> .....	65
<b>Ear and Arabic</b> اللغة العربية والأذن.....	89
<b>Glossary</b> .....	93
<b>MCQ</b> .....	99
<b>MCQ Answers</b> .....	104
<b>References</b> .....	105
<b>Index</b> .....	107