

# Comprehensive and Clinical Anatomy of the Middle Ear

Salah Mansour  
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Hassan Haidar Ahmad  
Karen Nicolas  
Stéphane Louryan

*Second Edition*

 Springer

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*To my wife, Ruth, for her constant love and support; for my three sons, grandchildren, and all the Mansour family.*

Salah Mansour

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## Preface



Following the great success of the first edition of *Comprehensive and Clinical Anatomy of the Middle Ear*, our publisher invited the team of authors to produce a second edition. We worked diligently to present new anatomical facts and concepts, which build upon continuing surgical experience and advanced correlated endoscopic and imaging acquisitions.

Although human anatomy is a stable basic knowledge, when it concerns the ear, it remains a dynamic discipline where nothing is set in stone. This second edition reports the latest observations to enable better otology training and enhance surgical approaches.

Most of the anatomy described in the first edition is still valid and pertinent. However, additional anatomical details and their functional importance are reported in this second edition. These additions and other refinements provide improved diagnostic orientations and suggest more precise surgical procedures in the middle ear.

In every chapter of this second edition, subchapters and subdivisions report and illustrate updated elements of embryology and anatomy, as well as relevant modern endoscopic and imaging illustrations to better perform otological surgery. Additional knowledge concerning the mechanics of middle ear anatomical content is introduced to assist in the understanding of its clinical significance and its importance to the surgical setting.

We have also added a new chapter to explain the fragile structure of the middle ear as an organ and its comparative evolution during phylogenesis, aiming to offer a holistic vision for handling the middle ear.

Most illustrations, anatomical plate dissections, endoscopic and microscopic pictures, and imaging demonstrations were revisited for the purposes of this second edition. This allows us to better highlight normal middle ear anatomical details, congenital abnormalities, and conflictual pathological presentations. We wish to offer students and teachers a complete and up-to-date reference book concerning the functional anatomy of the middle ear. To do so, we not only draw from our knowledge and experience as practitioners but also discuss current modern otology research. This second edition reviews

the recent literature relative to the discipline and references many new and interesting sources.

This second edition is the result of close collaboration among good friends and colleagues. It is a tribute to their dedication to medical teaching and their desire to expand the knowledge of practitioners everywhere.

Beirut, Lebanon

Salah Mansour

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## Preface



Colombiers, France

A second edition gives the opportunity to revisit our knowledge, expand upon our experiences, and offers an updated presentation. I also think of it as confirmation that the *Comprehensive and Clinical Anatomy of the Middle Ear* met the expectations of our fellow specialists. So, again under the guidance of Prof. Salah Mansour, it was a great pleasure to work with the same enthusiastic team. New anatomical pictures have been added. This edition reconfirms the notion that temporal bone dissection is an indispensable step for the theoretical teaching of surgery.

Jacques Magnan



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## Preface



central collaboration and enjoyable and informative.

Doha, Qatar

The great success of the first edition of this book motivates us to go further in depth digging for a complete and most interesting knowledge concerning middle ear anatomy and its complex functional architecture. Our aim was to update advances recently found following correlated disciplines, especially ear endoscopy, in order to make available a complete reference book for learners and teachers.

I am thankful for the active collaboration between all members of the team of authors; their conjugate efforts render the present work most

Hassan Haidar

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## Preface



Computed tomography is the most precise radiologic modality available for the study of the anatomy of the middle ear. The otologist's practice and teaching during clinical, preoperative, and postoperative work are supported by the knowledge of the usual CT aspects of the walls, contents, and compartments neighboring the noble anatomic structures of the temporal bone. Such knowledge should be a baseline for any otology candidate.

This second edition showcases new CT images to illustrate the detailed anatomy of middle ear structures. Anatomical variants and pathological aspects have been added to enlarge the imaging spectrum in several sections.

I want to thank Professor Mansour and my coauthors for their constructive and active collaboration: their contribution was essential to the orientation of imaging studies to the needs of the otologist.

I hope this book will encourage continued dialogue among radiologists and surgeons in their daily practice. I firmly believe such collaboration is key to advancing both disciplines.

Mount Lebanon, Lebanon

Karen Nicolas

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## Preface



This second edition adds data concerning the developmental genetics and comparative anatomy of the middle ear structures.

Embryology progressively gives place to developmental biology, which offers ways to understand congenital malformations. Some of these abnormalities can be understood in the light of evolution and comparative anatomy. The close relationships of middle ear ossicles with the tem-

poro-mandibular joint are also discussed and can explain some pathological signs, such as tinnitus.

The precise embryological origin of middle ear ossicles is still debated, and this second edition takes account of such controversy.

The human embryo histological sections come from collections of the Louis Deroubaix anatomy and embryology Museum, Université libre de Bruxelles.

Brussels, Belgium

Stéphane Louryan

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