

Tumors of the Upper Aerodigestive Tract, Ear, and Jaw

*AFIP Atlases of
Tumor and
Non-Tumor Pathology*



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AFIP ATLASES OF TUMOR AND NON-TUMOR PATHOLOGY

Fifth Series

Fascicle 22

TUMORS OF THE UPPER AERODIGESTIVE TRACT, EAR, AND JAW

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DEDICATIONS

To my wonderful husband and favorite poet, Judson—your inspiration and love brighten every day. And to our dear friends, Katy and Iris, for sharing your caring spirit and “joie de vivre.”

William C. Faquin, MD, PhD

Thank you Rory, Avery, Riley, and Ashley for your love and support.

Justin A. Bishop, MD

To my wonderful wife, Dani, and my twin boys James and Tiago – thank you for your support and for bringing joy and laughter to the moments in between all of my work at the job that I so love doing. To Samir El-Mofty DMD, PhD, MS – thank you for sparking in me the love and appreciation of head and neck pathology.

James S. Lewis, Jr., MD

In appreciation to my family for their support and with gratitude to my mentors for their encouragement, guidance, and wisdom imparted to me over the years.

Susan Müller, DMD, MS

A Sonnet to Pamela A. Thompson

*When time doth pass, and words are slow to form,
I labor long beneath a thoughtful sky.
Yet none, my dearest, doth endure the storm,
Of patience so, as thou with watchful eye.
Thine heart, so free, doth offer thanks so sweet,
With naught but simple words, it heals all ills.
“Thank thee, love,” makes all my work complete—
A better gift none ever gave with skill.
Thy wisdom shines like sunlight on a stream,
In thee, I’ve learned what others cannot teach.
Thy hand doth guide me softly, but the beam
Of all thy counsel makes my spirit reach.
Thine eyes, my love, are sharp with tender care,
To see the joy, the pain, in others’ eyes.
Thy heart is quick to feel, and quick to share—
Such love doth spark, and none can e’er despise.*

*Thy loyalty, as firm as oak's own root,
Unshaken, even in the storm's cruel blast.
Thy truth is sharp, thy justice doth salute,
And by thy side, I know I stand steadfast.*

*As sailors trust the anchor in the night,
So do I trust thee, through the wildest seas.
In thee I find my anchor, strong and right,
And with thy love, my soul finds sweetest ease.*

Lester D. R. Thompson, MD

To all the mentors and colleagues who contributed to my understanding of pathology and my professional evolution. I am honored to now have an opportunity to share my expertise with others. A special thanks to my wife, Susan, and her unwavering support of my academic career.

John M. Wright, DDS, MS



EDITOR'S NOTE

The Atlases of Tumor Pathology have a long and distinguished history. They were first conceived at a cancer research meeting held in St. Louis in September 1947, as an attempt to standardize the nomenclature of neoplastic diseases. The first series was sponsored by the National Academy of Sciences-National Research Council. The organization of this formidable effort was entrusted to the Subcommittee on Oncology of the Committee on Pathology, and Dr. Arthur Purdy Stout was the first editor-in-chief. Many of the illustrations were provided by the Medical Illustration Service of the Armed Forces Institute of Pathology (AFIP), the type was set by the Government Printing Office, and the final printing was done at the Armed Forces Institute of Pathology. The American Registry of Pathology (ARP) purchased the Fascicles from the Government Printing Office and sold them virtually at cost. Over a period of 20 years, approximately 15,000 copies each of nearly 40 Fascicles were produced. The worldwide impact of these publications over the years has largely surpassed the original goal. They quickly became among the most influential publications on tumor pathology, primarily because of their overall high quality, but also because their low cost made them easily accessible the world over to pathologists and other students of oncology.

Upon completion of the first series, the National Academy of Sciences-National Research Council handed further pursuit of the project over to the newly created Universities Associated for Research and Education in Pathology (UAREP). The Second Series was started, generously supported by grants from the AFIP, the National Cancer Institute, and the American Cancer Society. Dr. Harlan I. Firminger became the editor-in-chief and was succeeded by Dr. William H. Hartmann. The Second Series Fascicles were produced as bound volumes instead of loose leaflets. They featured a more comprehensive coverage of the subjects, to the extent that the Fascicles could no longer be regarded as "atlases" but rather as monographs describing and illustrating in detail the tumors and tumor-like conditions of the various organs and systems.

Dr. Juan Rosai was appointed as editor-in-chief of the Third Series, and Dr. Leslie Sobin became associate editor. A distinguished Editorial Advisory Board was also convened, and these outstanding pathologists and educators played a major role in the success of this series, the first publication of which appeared in 1991 and the last (number 32) in 2003.

The same organizational framework applied to the Fourth Series, meticulously edited by Dr. Steven Silverberg with Dr. Ronald DeLellis as the associate editor. With UAREP and AFIP no longer functioning, ARP remained the responsible organization. The Fourth Series volumes were hardbound with illustrations almost exclusively in color. There was also an increased emphasis on the cytopathologic (intraoperative,

exfoliative, or fine needle aspiration) and molecular features that are important in diagnosis and prognosis. At the time of the Fourth Series, ARP also produced Atlases of Non-Tumor Pathology; these volumes were numbered separately from the tumor volumes.

As in the prior series, the goal of the Fifth Series includes a continuous attempt to correlate, whenever possible, the nomenclature used in the Fascicles with that proposed by the World Health Organization Classification of Tumors, as well as to ensure a consistency of style. Including molecular diagnostics is more important than ever, as is the availability of an online component, a more nimble website (www.arppress.org), and a social media presence. Now in this series, the tumor and non-tumor volumes are combined and consecutively numbered as the Atlases of Tumor and Non-Tumor Pathology. Close cooperation between the various authors and their respective liaisons from the Editorial Board will continue to be emphasized in order to minimize unnecessary repetition and discrepancies in the text and illustrations.

Particular thanks are due to the members of the Editorial Advisory Board, our reviewers, the editorial and production staff, and the individual Fascicle authors for their ongoing efforts to ensure that this series is a worthy successor to the previous four.

Jason L. Hornick, MD, PhD



PREFACE

The head and neck region is a marvel of anatomic complexity—a compact corridor of life where form, function, and pathology converge in fascinating and often perplexing ways. It encompasses a broad array of subsites, each with its own architectural nuances, composed of an eclectic assortment of tissues: squamous and glandular epithelium, adipose and skeletal muscle, bone, lymphoid elements, and the ever-enigmatic neural crest derivatives. The diversity is such that one might reasonably suspect nature of showing off.

Predictably, this histologic richness begets a commensurate diversity of disease. The spectrum of neoplastic and non-neoplastic conditions encountered in this region is as broad as it is diagnostically demanding, arguably exceeding that of any other anatomic territory. To navigate it with confidence, the surgical pathologist must draw upon a wide foundation in general anatomic pathology, a sharp eye for nuance, and a readiness to consult both textbook and tea leaves.

In recent years, the landscape of head and neck pathology has undergone something of a molecular renaissance. Advances in our understanding of the genetic and epigenetic alterations that underlie many of these tumors have not only refined their classification, but also reshaped our approaches to diagnosis, prognosis, and therapy. Today, molecular analysis sits alongside histology and immunohistochemistry as an essential pillar of diagnostic pathology—a kind of molecular Rosetta Stone for modern disease.

This Fascicle, comprising eight chapters authored by experts in the field, reflects these scientific and diagnostic evolutions. Departing from prior editions of the American Registry of Pathology (ARP) series that approached the upper aerodigestive tract (UADT) by tumor type, this volume is organized by anatomic subsite. Each chapter delves into the neoplastic conditions and key differential diagnoses germane to a specific location: the sinonasal tract, nasopharynx, oropharynx, oral cavity, larynx and hypopharynx, cervical lymph nodes, and ear. A new chapter, not included in previous UADT Fascicles, offers an in-depth look at tumors and cysts of the jaw, including those of odontogenic origin.

This anatomic framework, while inevitably accompanied by some overlap (squamous cell carcinoma, that pathologic polyglot, makes multiple appearances), is intended to provide readers with a more practical and intuitive means of navigating the field. Cross-referencing is encouraged; repetition, alas, is sometimes necessary; but confusion, we hope, is not.

Throughout the Fascicle, terminology generally aligns with the most recent edition of the World Health Organization (WHO) Classification of Head and Neck Tumours—the “Blue Book”—with a few considered departures, noted in context. Of

particular interest, the chapter on cervical lymph nodes incorporates cytologic findings from fine-needle aspiration (FNA), especially of lymph node metastases, a technique whose clinical utility in the evaluation of head and neck masses continues to expand.

It is our hope that this Fascicle serves as a useful companion—equal parts atlas, reference, and diagnostic confidant—for pathologists encountering the intricate, fascinating, and occasionally exasperating world of head and neck pathology.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to Dr. Jason Hornick and the ARP Press Editorial Advisory Board for the opportunity to contribute to this Fascicle. We are also deeply appreciative of the ARP staff—Elizabeth Tomlinson, Heidi Guerrero, and Dian Thomas—for their expert editing and tireless work behind the scenes in preparing this volume. Like many in the field, we regard the ARP Fascicles as the gold standard in pathology reference literature. It has been an honor to contribute to this esteemed series.

We thank our colleagues—Drs. Emad Ababneh, Gabriel Calzada, Robert Foss, Jason Fowler, Ruta Gupta, Mark Guralnick, Jason Hornick, Harry Kozakewich, Jinping Lai, Kelly Magliocca, Mitra Mehrad, Peter Sandow, and Ann Sandison—for generously providing slides and images of rare entities featured in this work. We are also grateful to Drs. Nicole Cipriani and Manju Prasad for their thoughtful review of the Fascicle and for offering the valuable feedback that helped refine the final version. Special thanks are due to Catherine E. Kiefe for her beautiful anatomic and histologic illustrations, which enrich many of the chapters, and to Dr. Mohamed Abdelsalam for his invaluable assistance in organizing the extensive Endnote reference files.

We also acknowledge the contributions of our colleagues at our current and former institutions, whose surgical and cytologic cases form a significant part of the material presented. We are indebted as well to the many pathologists around the world who have shared challenging head and neck cases through consultation, providing insights that broadened our understanding of the morphologic spectrum and differential diagnoses of these head and neck tumors.

Finally, we extend our deepest appreciation to Drs. Stacey E. Mills, Edward B. Stelow, and Jennifer L. Hunt—authors of the previous UADT Fascicle—and to Drs. Robert A. Robinson and Steven D. Vincent—authors of the earlier Tumors and Cysts of the Jaws Fascicle. Their expertise and exemplary contributions to the field of head and neck pathology have served as both inspiration and foundation for this edition. In some instances, we have retained their superb clinical

and microscopic images, a testament to the enduring value of their work. The high standards associated with this series—and particularly this volume—reflect the dedication and scholarship of those who came before us.

William C. Faquin, MD, PhD

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James S. Lewis, Jr., MD

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