SALIVARY GLAND CYTOLOGY
A Color Atlas

Edited by

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WILEY-BLACKWELL
A JOHN WILEY & SONS, INC., PUBLICATION
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The contents of this book do not represent the views of the Department of Veterans Affairs or the United States Government.

This work was supported by resources of the James H. Quillen VA Medical Center, Mountain Home, Tennessee, USA.

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey
Published simultaneously in Canada

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Library of Congress Cataloging-in-Publication Data:
p. ; cm.
Includes bibliographical references.
ISBN 978-0-470-50092-7 (cloth)
RC280.S3S25 2011
616.99431—dc22
2010028405
Printed in Singapore
## CONTENTS

<table>
<thead>
<tr>
<th>Preface</th>
<th>vii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributors</td>
<td>ix</td>
</tr>
</tbody>
</table>

1. **Introduction to Salivary Gland Lesions Cytology**
   *Mousa A. Al-Abbadi, MD, FIAC*

2. **Surgery for Salivary Gland Lesions: A Surgeon’s Perspective**
   *Ozlem E. Tulunay-Ugur, MD*

3. **Radiological Investigation of Salivary Gland Lesions**
   *Imad Zak, MD*

4. **Infectious and Inflammatory Diseases of Salivary Glands**
   *Wael N. Zakaria, MD, Isam A. Eltoum, MD, MBA, FIAC, Mousa A. Al-Abbadi, MD, FIAC*

5. **Pleomorphic Adenoma**
   *Jining Feng, MD, PhD, Mousa A. Al-Abbadi, MD, FIAC*

6. **Warthin’s Tumor**
   *Mousa A. Al-Abbadi, MD, FIAC*

7. **Mucoepidermoid Carcinoma**
   *Ruba Halloush, MD*

8. **Carcinoma Ex Pleomorphic Adenoma**
   *Husain A. Saleh, MD, FIAC, MBA*
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Acinic Cell Carcinoma</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td><em>Eyas M. Hattab, MD, Harvey M. Cramer, MD</em></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Basaloid Salivary Gland Tumor</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td><em>Jerzy Klijanienko, MD, PhD, MIAC, Isam A. Eltoum, MD, MBA, FIAC</em></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Adenoid Cystic Carcinoma</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td><em>Husain A. Saleh, MD, FIAC, MBA</em></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Oncocytoma</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td><em>Jay K. Wasman, MD, Fadi W. Abdul-Karim, MD</em></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Myoepithelioma and Related Lesions</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td><em>Pamela Papas, MD, Momin T. Siddiqui, MD</em></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Polymorphous Low-Grade Carcinoma</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td><em>Jerzy Klijanienko, MD, PhD, MIAC, Mousa A. Al-Abbadi, MD, FIAC</em></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Salivary Duct Carcinoma</td>
<td>181</td>
</tr>
<tr>
<td></td>
<td><em>Jerzy Klijanienko, MD, PhD, MIAC, Mousa A. Al-Abbadi, MD, FIAC</em></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Salivary Gland Lymphomas</td>
<td>187</td>
</tr>
<tr>
<td></td>
<td><em>Mohammad Abuel-Haija, MD, Magdalena Czader, MD, PhD</em></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Metastases and Rare Primary Neoplasms of Salivary Glands</td>
<td>215</td>
</tr>
<tr>
<td></td>
<td><em>Mousa A. Al-Abbadi, MD, FIAC</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index</td>
<td>243</td>
</tr>
</tbody>
</table>
PREFACE

Real victories are those that protect human life, not those that result from its destruction or emerge from its ashes.

King Hussein

This book is dedicated to all humans suffering from the calamities of cancer. I would like specifically to devote this effort to the late King Hussein of the Hashemite Kingdom of Jordan, who succumbed to cancer. God bless his soul.

In my early professional years, I was always intrigued and fascinated by salivary gland cytology; it often appeared simple and straightforward, yet at times was very challenging. It is hoped that this first edition will help clarify, simplify, and streamline the diagnostic thought process when facing an aspirate from a salivary gland lesion. I had the good fortune to work in an institution with a very busy otolaryngology oncology service, and hence, fine needle aspiration of such lesions was very common. The wealth of the material that we studied was rich and with a broad spectrum of flavors.

All pathologists know that a very diverse group of diseases can originate from the salivary gland and that tumors from such a small organ are numerous. A great deal of overlap is evident using routine histology and even more with cytology, which led to diagnostic challenges for both the surgical pathologist and the cytopathologist alike. That is why I became interested in the subject and started the preparations to contribute with an atlas describing these lesions. The hope is to provide additional information to what has already been published about the topic. Fortunately for all of us practicing diagnosticians, only a handful of salivary gland tumors comprise the majority of neoplasms that we face. Although some pathologists are hesitant to accept fine needle aspiration biopsy as an initial diagnostic tool, we strongly believe that proper sampling and proper technique combined with the utilization of adequate clinical data provide enough ammunition to establish either a categorical or a specific diagnosis. It is hoped that this atlas, in its first edition, will help readers in their diagnostic journey of salivary gland cytology.
The readers will cruise through this atlas easily finding answers to many questions about salivary gland lesions cytology. After a brief introduction, the key cytologic diagnostic features are demonstrated followed by a differential diagnosis and clues to make a definite interpretation. The summary of these two critical issues is shown in a simple table format. A brief description of the histologic correlate with key illustrations follows. I believe that the aforementioned strategy helps resolve many questions for the clinical practitioner.

It is hoped that this book will be a positive addition and will complement many other valuable contributions on the subject by many colleagues.

I am deeply indebted to all my previous teachers and mentors who, over the years, gave me encouragement and support leading to this work. I would also like to thank all our contributors for their efforts to help make this atlas a reality. Without their efforts this would not be possible. The last chapter was not initially planned since it describes rare entities that are difficult to find. However, it was accomplished with valuable illustrations shared by our contributors.

Finally, I would like to thank all members of my family for all the support they have given me over the years.

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CHAPTER 1

INTRODUCTION TO SALIVARY GLAND LESIONS CYTOLOGY

MOUSA A. AL-ABBADI, MD, FIAC

1.1 INTRODUCTION

The salivary glands are part of the exocrine secretory apparatus that are traditionally considered part of the upper gastrointestinal tract. They are a very small organ with an average total weight of 50 g in adults compared with other systems. They are composed of two major groups: the major and minor salivary glands. The major glands are composed of three paired relatively larger glands: the parotid, submandibular, and sublingual. The minor group is numerous and widely distributed in the upper aerodigestive tract (Figure 1.1).

1.2 BASIC HISTOLOGY AND PHYSIOLOGY

Salivary glands secrete digestive enzymes from their main functional unit “the acinus.” The major histological components of salivary glands are as follows (Figure 1.2 illustrates these components and their cytological correlates):

1. Acinus: The main functional unit that is composed of wedge-shaped cells, each with abundant cytoplasm pushing a small round-to-oval nucleus to its periphery. They can be serous where they mainly secrete amylase, and their cytoplasm appears basophilic and densely granular with zymogen granules. These granules are periodic acid Schiff
positive and diastase resistant. The mucinous acini secrete sialomucin, and their cytoplasm appears clear with vacuoles. The parotid gland is almost purely serous, whereas both the submandibular and the sublingual are mixed. The submandibular is more serous, and the sublingual is more mucinous.

2. Ducts: They start as small, intercalated ductules between acinar cells that are lined by single, small cuboidal cells with relatively large, centrally located nuclei. These are difficult to see on histological sections. These ductules will then join and form larger, striated ducts lined by taller columnar cells with much more abundant and eosinophilic cytoplasm rich in mitochondria. These in turn will join larger interlobar excretory ducts lined by pseudo-stratified columnar epithelium with similar features.

3. Myoepithelial cells: These stellate-shaped cells are contractile and are located outside the basement membrane of the acinar cells. They contain smooth muscle actin, myosin, and intermediate filaments such as keratin. They are difficult to see histologically.

1.3 DISEASES THAT AFFECT SALIVARY GLANDS

Many diseases can affect salivary glands. The common entities range from inflammatory/infectious non-neoplastic lesions, benign neoplasms, and
FIGURE 1.2. The three images were combined to show the three major cellular components of salivary glands. The left image is from an aspirate smear (Papanicolaou stain, 200×); the middle image is the corresponding histological section (hematoxylin and eosin, 400×); and the right image is from a cell block (hematoxylin and eosin, 200×).