



P. Stoll G. Dallenbach-Hellweg

Cytology in Gynecological Practice

An Atlas of Phase-Contrast Microscopy

Second Edition
with 149 Figures

Springer-Verlag
Berlin Heidelberg New York
London Paris Tokyo
Hong Kong Barcelona
Budapest

Professor Dr. med. PETER STOLL, FIAC (hon)
emer. Ordinarius für Geburtshilfe und Gynäkologie
an der Universität Heidelberg
eh. Direktor der Frauenklinik im Klinikum Mannheim
der Universität Heidelberg
Collincenter 18/19
6800 Mannheim 1

Professor Dr. med. GISELA DALLENBACH-HELLWEG, FIAC
eh. Professorin und wissenschaftliche Leiterin
der morphologischen Forschung
der Frauenklinik im Klinikum Mannheim
der Universität Heidelberg
Institut für Pathologie, A2, 2
6800 Mannheim 1

Library of Congress Cataloging-in-Publication Data
Stoll, Peter. [Gynäkologische Vitalzytologie in der Praxis. English]
Cytology in gynecological practice : an atlas of phase-contrast microscopy / P. Stoll,
G. Dallenbach-Hellweg. – 2nd ed. p. cm.
Rev. ed. of: Gynecological vital cytology. 1969. Includes bibliographical references.
ISBN-13: 978-3-642-76905-4 e-ISBN-13: 978-3-642-76903-0
DOI: 10.1007/978-3-642-76903-0
1. Generative organs, Female—Diseases—Diagnosis. 2. Exfoliative cytology. I. Dallenbach-
Hellweg, G. (Gisela) II. Stoll, Peter. Cytology in gynecological practice. III. Title. [DNLM:
1. Genital Diseases, Female—diagnosis—atlas. 2. Microscopy, Phase-Contrast—atlas. 3. Vaginal Smears—atlas.
WP 17 S875g] RG 107.5.E9S733 1993 618.1'07582—dc20 DNLM/DLC for Library
of Congress 92-48209

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1969, 1993
Softcover reprint of the hardcover 2nd edition 1993

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Product liability: The publishers cannot guarantee the accuracy of any information about dosage and application contained in this book. In every individual case the user must check such information by consulting the relevant literature.

Typesetting : Appl. Wemding
21/3145 – 5 4 3 2 1 0 – Printed on acid-free paper

Preface

As the advances in modern medicine continue, so does the need of the practicing physician to equip his examining room with technical instruments. The urge to remain modern requires that new equipment be purchased and the doctor strive to master its use, for it is only with skillful application of such equipment that the doctor can expect satisfactory results. It is impossible to foresee how improved techniques will affect office practice in the future. How a doctor adapts to new methods depends in part on his age and interests, but also on other factors. With time he will undoubtedly elect to forgo complicated technical procedures and refer such studies to others, furthering, we should like to hope, teamwork and cooperation between doctors. Many patients place great value on a complete, technically supported workup, and expect such as part of the doctor's examination. For many present-day patients technology has acquired a magical meaning: they judge the expertise of their doctor by the instrumentarium they see standing conspicuously in his examining rooms. Other patients, on the contrary, desire a thorough consultation and care, expecting a sufficient but minimum of technical procedures, trusting their doctor to use only what is needed.

This atlas follows the last principle. It recommends the use of *phase-contrast microscopy in office practice*, since the technique provides the doctor with an interest in morphology much valuable additional information during the examination of the patient. Such information includes: evaluation of the patient's hormonal status ("Doctor, how is my hormonal condition?"); determining the phase of the cycle, as read from the smear and compared with the clinical history; the diagnosis of sterility problems (sperm count, sperm motility etc.); the diagnosis of bacterial flora of the vagina, allowing recognition of an inflammation, its etiology and its prompt treatment, and finally with reservations, the search for and recognition of atypical cells. If suspicion of malignancy arises, the definitive diagnosis must be left to the cytology laboratory or to the histopathology laboratory. Examination under the phase-contrast microscope allows one to eliminate those smears showing intense inflammatory changes; that is, those which would also be unacceptable in the cytology laboratory. After an appropriate, local treatment the smear can be repeated.

Special attention was paid not to select unusually beautiful smears for the photomicrographs. Those presented here are as routinely visualized under the phase-contrast microscope during the exami-

nation of the patient in the office. Such microscopic studies can be incorporated into the complete diagnostic workup of the patient. The technique affords the patient a chance to look into the microscope and see for herself, especially when she asks about her "hormonal condition". It is possible to explain to her that here the peripheral actions of the hormones on the tissue are immediately apparent, whereas the usual determination of serum levels of hormones represents a transient measurement of a fluctuating quantity. The direct diagnosis of the vaginal flora enables specific treatment to be prescribed during the examination.

We express our gratitude to Dr. Heinz Gundlach, Oberkochen (Carl Zeiss) for the description of the technical background. We also extend our thanks to Prof. Dr. Frederick D. Dallenbach for the English translation.

We are convinced that the technique described in this book provides the gynecologist, as well as those general practitioners performing gynecological examinations, with a valuable adjunct to use with the colposcope.

Mannheim, January 1993

P. STOLL

G. DALLENBACH-HELLWEG

Contents

1	Development and Significance of Cytology for the Diagnosis of Carcinoma	9
2	Technical Background	12
2.1	The Principles of the Technique.....	12
2.2	Design and Operation of the Phase-Contrast Microscope .	13
2.3	Nomarski Differential Interference Contrast	13
3	Gynecological Applications of Cytology	14
4	Examination Procedure	15
5	Characteristics of Fresh Cells in Phase-Contrast Microscopy	17
5.1	Single Cells.....	17
5.1.1	Normal Squamous Epithelia	17
5.1.2	Normal Columnar Epithelia	17
5.1.3	Metaplastic Cells.....	18
5.1.4	Dyskaryotic Cells	18
5.1.5	Carcinoma Cells	18
5.2	Diagnosis of Ovarian Function	19
5.2.1	Phases of the Menstrual Cycle	19
5.2.2	Pregnancy.....	20
5.2.3	Diagnosis of Rupture of the Fetal Membranes.....	21
5.2.4	Postmenopausal Smear	21
5.2.5	Menstrual Cycle Anomalies.....	22
5.2.6	The Effect of Hormone Treatment on the Vaginal Epithelium	23
5.3	Microbiological Diagnosis	24
5.3.1	Döderlein Bacilli (Lactobacilli).....	24
5.3.2	Trichomonads	24
5.3.3	Vaginal Mycoses	24
5.3.4	Gardnerella Vaginalis	24
5.3.5	Mixed Bacterial Flora	24
5.3.6	Chlamydiae	24

5.4	Search for Tumor Cells	24
5.5	Secondary Findings	25
5.5.1	Leukocytes	25
5.5.2	Erythrocytes	25
5.5.3	Histiocytes	25
5.5.4	Muscle and Connective Tissue Cells	25
5.5.5	Spermatozoa	25
5.5.6	Mucous Substances	26
5.6	Secondary Changes in Cells	26
5.6.1	Cytolysis	26
5.6.2	Autolysis	26
5.6.3	Atrophic Cell Cohesion	26
5.7	Artifacts	26
5.8	The Inadequate Smear	27
6	References	28
	Technical Illustrations	59
	Cytological Illustrations	65