Aspiration Biopsy Cytology
Part 1
Cytology of Supradiaphragmatic Organs

Monographs
in Clinical Cytology

Vol. 4

Editor: George L. Wied, Chicago, Illinois

Co-Editors:
Emmerich von Haam, Columbus, Ohio; Leopold G. Koss, New York, N.Y.
James W. Reagan, Cleveland, Ohio

S. Karger • Basel • München • Paris • London • New York • Sydney

Aspiration Biopsy Cytology

Part 1
Cytology of Supradiaphragmatic Organs

J. Zajicek
Department of Clinical Cytology, Institute of Tumour Pathology,
Karolinska Sjukhuset, Stockholm

With 141 figures comprising 279 single illustrations, 16 tables, and 5 color plates

S. Karger • Basel • München • Paris • London • New York • Sydney

Monographs in Clinical Cytology


Contents

Acknowledgements X
Preface IX
1. Introduction to Aspiration Biopsy 1
   Instruments 1
   The Puncture 3
   Transcutaneous Aspiration Biopsy of Palpable Lesions 3
   Transrectal and Transvaginal Aspiration Biopsy 5
   Transcutaneous Aspiration Biopsy of Non-Palpable Lesions 8
   Lungs 8
   Kidneys 10
   Bone 11
   Preparation of Smears 11
   Use of Filter Membranes 15
   Use of Aspiration Biopsy in Clinical Research 15
   Complications 20
   Local Dissemination of Tumour Cells 21
   Vascular Dissemination of Tumour Cells 23
Organisational Problems 24
References 27
2. Salivary Glands 30
General Data 30
Palpable Lesions of Salivary Glands 32
Non-Neoplastic Lesions 33
Cysts 33
Lymphadenitis 33
Sialoadenitis 34
Benign Lymphoepithelial Lesions and Related Conditions - Mikulicz’s and
Sjogren’s Syndrome 34
Benign Tumours 36
Pleomorphic Adenoma 36
Basal Cell Adenoma 37
Adenolymphoma 38
Oncocytoma 40
Sebaceous Cell Adenoma 42
Malignant Tumours 42
Acinic Cell Carcinoma 43
Adenoid Cystic Carcinoma 46
Miscellaneous Forms of Adenocarcinoma 50

VIII Contents

Carcinoma in Pleomorphic Adenomas 51
Mucoepidermoid Carcinoma 52
Squamous Cell Carcinoma 57
Undifferentiated Carcinoma 58
Accuracy of the Method 58
Benign Neoplasms 60
Carcinomas 62
References 64
Palpable Lesions of the Neck. Introduction to Chapters 3-6 66
3. Thyroid 67
General Data 67
Goiter 70
Colloid Goiter 72
Thyrotoxic Goiter 73
Inflammatory Goiter 73
Acute Suppurative Thyroiditis 75
Subacute Thyroiditis 75
Chronic Lymphoid Thyroiditis 76
Neoplastic Goiter (Benign and Malignant) 77
Adenomas 77
Carcinomas 79
Follicular Carcinoma 79
Papillary Carcinoma 81
Medullary Carcinoma 83
Anaplastic Giant Cell Tumour 85
Small-Cell Anaplastic Tumour 85
Metastases to the Thyroid Gland 87
Tumours Arising in the Parathyroids 87
References 89
4. Lymph-Nodes of the Neck 90
General Data 90
Aspiration Biopsy 92
Primary Lesions 94
Reactive Hyperplasia 94
Malignant Lymphomas 97
Lymphocytic Lymphomas 98
Histiocytic Lymphomas (Reticulum Cell Sarcoma) 103
Differentiated Histiocytosis103
Plasma Cell Sarcoma103
Hodgkin’s Disease 103
Metastatic Carcinoma 107
Site of the Primary Tumour 107
Occult Primary Tumour 109
Histology of the Primary Tumours 111
Metastatic Squamous Cell Carcinoma 111
Metastatic Poorly Differentiated Carcinoma115
Metastatic Adenocarcinoma 117

Contents IX

Metastases from Mesenchymal Tumours 117
Accuracy of the Method 119
References 122
5. Congenital Cysts 125
Accuracy of the Method 128
References 130
6. Carotid Body Tumours 131
Accuracy of the Method 133
References 135
7. Breast 136
General Remarks 138
Non-Neoplastic Lesions 140
Mastitis 140
Fat Necrosis 143
Benign Mammary Dysplasias 143
Benign Neoplasms 154
Fibroadenoma 157
Cellular Intracanalicular Fibroadenoma - Sarcoma Arising in Cellular Intracanalicular
Fibroadenoma 161
Adenoma of Breast 164
Duct Papilloma 164
Precancerous Lesions - Intraduct Carcinoma 166
Infiltrating Carcinoma 168
Duct Carcinoma 171
Apocrine Cell Carcinoma 178
Lobular Carcinoma 178
Mucous Carcinoma 179
Rare Carcinomas 179
Accuracy of Aspiration Biopsy Cytology in the Diagnosis of Carcinoma of the
Breast 185
Comments 190
References 192
8. Lungs 195
Introduction 195
Biopsy Technique 196
Complications 197
Normal Lung Tissue 199
Inflammatory Lesions of the Lung 199
Neoplastic Lesions 201
Accuracy of the Method 206
References 207
Subject Index 209

Color transparencies of the selected illustrations presented in chapters 1-7 of this
monograph may be ordered by writing to the following address : The Tutorials
of Cytology, 5841 Maryland Avenue HM No. 449, Chicago, Illinois 60637,
USA (Request : teaching slide sets in cytology Nos 1 and 3)

Acknowledgements

Without the continuous support of the Cancer Society in Stockholm
this work could not have been accomplished.
To my colleagues at Radiumhemmet and other departments of Karolinska Sjukhuset I express my thanks for their never-failing interest. I am especially grateful to Dr. Pier Luigi Esposti, Dr. Sixten Franzén, Dr. Torsten Löwhagen and Dr. Gunnar Söderberg for their valued collaboration in the diagnostic and scientific work upon which this volume is based.

For assistance with the photomicrographs my gratitude is due to Roland Lindfors.

I am indebted to Prof. Gunnar Moberger, Head of the Institute of Tumour Pathology, and Prof. Jerzy Einhorn, Head of Radiumhemmet, for valuable discussions over many years.

Dr. Torsten Löwhagen and Dr. Sven Dahlgren kindly consented to contribute with chapters on aspiration biopsy of the thyroid (T. Löwhagen) and of the lungs (S. Dahlgren). I gratefully acknowledge this assistance.

Preface

Clinical cytology today embraces both exfoliative and aspiration biopsy cytology. These two branches, however, have developed as separate disciplines. In the evolution of exfoliative cytology the achievements of Dr. George Papanicolaou have been decisive. Aspiration biopsy cytology has no corresponding single name. During several decades haematologists throughout the world have used the method for the diagnosis of benign and malignant conditions of the bone-marrow. Large-scale use of aspiration biopsy for the diagnosis of neoplastic disorders in other organs was made in the early 1930s by H. E. Martin and E. B. Ellis at the Memorial Center in New York. But aspiration biopsy for this purpose did not attain popularity in the USA, where progress in surgical pathology, which in most cases provided more exact information, made the need for development of this cytologic method less urgent.

A different situation prevailed in countries where pathology was less clinically oriented. Haematologists, who were already familiar with the technique of aspiration biopsy and with the interpretation of smears of bone-marrow aspirate, used this technique on other haematogenic organs such as the spleen and lymph-nodes. From this point progression was natural to the needling of the liver, thyroid, lungs and breast.

Unlike exfoliative cytology, aspiration biopsy cannot be employed in screening for undetected malignant or premalignant conditions. Its field of use is in the diagnosis of palpable or roentgenologically visible lesions. The aim of aspiration biopsy is to provide a diagnosis agreeing as closely as possible with that obtainable from histologic examination. It has proved especially useful in lesions that are not easily accessible for surgical biopsy,
such as the lungs, prostate and kidneys. But once aspiration biopsy has been introduced in a clinical centre, its use as a rule is increasingly extended to the diagnosis of lesions in organs from which surgical specimens can readily be obtained, such as the breast, lymph-nodes or thyroid. The main reason is the desire of clinicians for microscopic confirmation of a presumptive diagnosis for or against a neoplasm before the treatment of the lesion is considered.

XII Preface

Despite the obvious advantages of aspiration biopsy cytology, its rate of general acceptance has been fairly slow. Pathologists were at first understandably reluctant to accept a morphologic diagnostic technique in which they had not been trained and the reliability of which had not been fully documented. Not until the value of exfoliative cytology had been recognised by pathologists did the scientific climate favour further development of aspiration biopsy cytology. The success of exfoliative cytology familiarised many pathologists with the principles of cytdiagnosis, and to trained cytopathologists aspiration biopsy opened up fresh approaches to diagnostic fields hitherto reserved for surgical pathology. Although cytologic methods will never eliminate the need for histologic diagnosis, clinical experience over the past decades has shown that aspiration biopsy has a definite place in the management of neoplastic disorders. The project of which this book forms the first part, was undertaken with the aims of indicating the role of aspiration biopsy cytology in routine clinical practice and how the information thereby provided should most judiciously be used.

The first part of the project concerns aspiration biopsy of supradiaphragmatic organs (salivary glands, cervical lymph-nodes, thyroid, breast, lungs, etc.). A second volume will deal with the cytology of infradiaphragmatic organs (spleen, liver, pancreas, kidneys, ovaries, prostate and testes) and a third with soft-tissue tumours and tumours of bone and brain. The work of aspiration cytology must be performed by cytopathologists. It cannot be delegated to cytotechnologists. A knowledge of the subject, however, gives technologists unique opportunities to become acquainted with tumour cytology in general. This volume therefore includes some basic information which doctors may find elementary, but which may be of assistance to cytotechnologists.