

# EARLY GASTRIC CANCER

CURRENT STATUS OF DIAGNOSIS

Edited by

E. Grundmann   H. Grunze   S. Witte

## Participants

Classen, M. Medizinische Universitätsklinik Erlangen, D-8520 Erlangen, Krankenhausstr. 12, Germany

Clodi, P. H. Krankenhaus der Barmherzigen Brüder, A-4010 Linz, Rudigierstr. 11, Austria

Crespi, M. Centro Prevenzione Tumori, Istituto „Regina Elena“, Viale Regina Elena 291, I-00161 Roma, Italy

Debray, Ch. Hôpital Bichat, 170, Boulevard Ney, F-75018 Paris, France

Eder, M. Pathologisches Institut der Universität, D-8000 München 2, Thalkirchener Str. 36, Germany

Elster, K. Pathologisches Institut der Städtischen Krankenanstalten, D-8580 Bayreuth, Kulmbacher Str. 23, Germany

Figus, A. J. Gastroenterological Department of Hospital Jászberény, Jászberény, Hungary

Frik, W. Abteilung Radiologie der Medizinischen Fakultät an der Technischen Hochschule Aachen, D-5100 Aachen, Goethestr. 27-29, Germany

Gedigk, P. Pathologisches Institut der Universität, D-5300 Bonn-Venusberg, Germany

Georgii, A. Pathologisches Institut der Medizinischen Hochschule, D-3000 Hannover-Kleefeld, Roderbruchstr. 101, Germany

Grundmann, E. Pathologisches Institut der Universität, D-4400 Münster, Westring 17, Germany

Grunze, H. Innere Abteilung der Krankenanstalten, D-5160 Düren, Roonstr. 30, Germany

Gutmann, R. A. Hôpital St. Antoine, 163, rue de la Pompe, F-75016 Paris, France

Heinkel, K. Medizinische Klinik des Städtischen Krankenhauses Bad Cannstadt, D-7000 Stuttgart 50, Prießnitzweg 24, Germany

Kawai, K. Division of Endoscopy, Kyoto Prefectural University of Medicine, Kawaramachi-Hirokoji, Kyoto, Japan

Mason, M. K. St. James's Hospital, Pathology Department, Leeds LS9 7TF, Yorkshire, England

Oshima, H. Klinikum Steglitz der Freien Universität Berlin, D-1000 Berlin 45, Hindenburgdamm 60

Ostertag, H. Pathologisches Institut der Medizinischen Hochschule, D-3000 Hannover-Kleefeld, Roderbruchstr. 101, Germany

Ottenjann, R. I. Medizinische Abteilung des Städtischen Krankenhauses München-Neuperlach, D-8000 München 83, Oskar-Maria-Graf-Ring 51, Germany

Prolla, J. C. Hospital de Clinicas de Porto Alegre, Caixa Postal 2300, Porto Alegre, RS/Brazil

Rehner, M. Chirurgische Universitätsklinik Hamburg-Eppendorf, D-2000 Hamburg 20, Martinistr. 52, Germany

Schade, R. O. K. Newcastle General Hospital, Department of Pathology, Westgate Road, Newcastle upon Tyne NE4 6BE, England

Schreiber, H. W. Chirurgische Universitätsklinik Hamburg-Eppendorf, D-2000 Hamburg 20, Martinistr. 52, Germany

Schäfer, P. K. Medizinische Universitätsklinik, D-5300 Bonn-Venusberg 1, Germany

Seifert, E. Medizinische Klinik der Medizinischen Hochschule, D-3000 Hannover, Podbielskistr. 380, Germany

Serck-Hanssen, A. Ullevål Sykehus, Department of Pathology, Oslo, Norway

Sprenger, E. Pathologisches Institut der Universität, D-7800 Freiburg, Albertstr. 19, Germany

Witte, S. Medizinische Abteilung des Krankenhauses der Evangelischen Diakonissenanstalt, D-7500 Karlsruhe 51, Postfach 510140, Germany

Zinser, K. H. Frauenklinik des Evangelischen Krankenhauses Köln-Lindenthal, D-5000 Köln 41, Weyertal 76, Germany

# Contents

## Introduction

E. Grundmann: Presidential Address . . . . .	3
H. Grunze and S. Witte: Some Historical and Topical Remarks Made by the Chairmen. . . . .	6
H. K. Zinser: Experiences in Early Detection of Carcinoma Colli Uteri . . .	10
H. W. Schreiber and M. Rehner: Surgical Treatment on Malignant Tumors of the Stomach . . . . .	16

## Pathogenesis of Stomach Cancer

M. Eder: Problems of Formal Genesis of Carcinoma of the Stomach . . .	27
---	----

### *Discussions by Invitation*

K. Elster: Malignant Degeneration of Gastric Polyps? . . . . .	34
M. Crespi, A. Bigotti, S. di Matteo: Pathogenesis of Stomach Cancer . .	35

## Early Gastric Cancer

M. K. Mason: Surface Carcinoma of the Stomach . . . . .	39
R. O. K. Schade: The Borderline Between Benign and Malignant Lesions in the Stomach . . . . .	45
E. Seifert, H. Ostertag, P. Otto: Incidence, Localization and Accuracy of Endoscopy and Guided Biopsy . . . . .	54

### *Discussions by Invitation*

K. Elster: False Diagnosis in the Diagnostics of Early Gastric Cancer . .	58
M. Crespi, A. Bigotti, S. di Matteo: Early Gastric Cancer . . . . .	60
K. Kawai, T. Miyaoka, Y. Kohli: Evaluation of Early Gastric Cancer from the Clinical Point of View . . . . .	63

## Present Results in Early Detection of Stomach Cancer by Radiologic Means

René A. Gutmann: Forty Years of Early Diagnosis of Gastric Cancer . . .	69
W. Frik: Early Radiologic Diagnostics of Stomach Cancer . . . . .	76



### *Discussions by Invitation*

K. Kawai: Present Results in Early Detection of Stomach Cancer by Radiologic Means . . . . .	82
M. Crespi, A. Bigotti, S. di Matteo: Present Results in Early Detection of Stomach Cancer by Radiological Means . . . . .	86

### **Present Results of Gastrocamera Technique in Early Detection of Stomach Cancer**

P. K. Schäfer and H. Oshima: Experiences with Gastrocamera Examinations as a Screening Method of the Stomach. . . . .	89
K. Heinkel: Early Diagnosis of Gastric Cancer. Methods and Limits. . . . .	99

### *Discussions by Invitation*

K. Kawai, Y. Kohli: Some Remarks about Gastric Biopsy Under Direct Vision . . . . .	102
K. Kawai, K. Ida, K. Kohli: Early Diagnosis of Stomach Cancer with Special Reference to the Dye Scattering Method of Endoscopy . . . . .	104

### **Gastrosocopy, Biopsy and Cytology in Early Detection of Stomach Cancer (Comparison of Efficiency of Different Techniques and of a Combination of Techniques)**

M. Classen and W. Rösch: Gastrosocopy, Biopsy and Cytology in Early Detection of Stomach Cancer . . . . .	113
S. Witte: The Results of Cytology Using the Technique of the Gastrosocopic Cell Brush, in Comparison with Biopsy, Endoscopy and Radiology . . . . .	118
Ch. Debray, P. Housset, Mme. C. Marche, J. Cl. le Parco, and A. Verdier: Diagnosis of Stomach Cancer Today . . . . .	120
A. Georgii, H. Ostertag, Z. Atay, and E. Seifert: Advantages of Combined Cytological-Histological Examinations in Guided Biopsies of the Stomach . . . . .	127
R. Ottenjann: Gastrosocopy, Biopsy and Cytology in Early Detection of Stomach Cancer . . . . .	131
J. C. Prolla: Gastrosocopy, Biopsy and Cytology in Early Detection of Stomach Cancer . . . . .	133

### **Special Remarks Concerning Efficiency and Problems in Cytology**

A. Serck-Hanssen, J. Marcussen, and L. Liavåg: Endoscopic Brush Cytology in the Diagnosis of Gastric Disease. Comparison With Other Diagnostic Measures . . . . .	139
S. Witte: The Place of Vital Microscopic Methods (Phase Contrast, Fluorescent Microscopy and Ultra-Violet Absorption) . . . . .	148
E. Sprenger, S. Witte, E. Schaden: The Differential Diagnostic Role of Nuclear DNA Contents in Gastric Cytology . . . . .	154
P. H. Clodi: Diagnosis of Gastric Carcinoma With the Aid of Brush Cytology . . . . .	159

M. Crespi, A. Bigotti, V. Casale: Special Remarks Concerning Efficiency and Problems in Cytology . . . . .	161
J. C. Prolla: Special Remarks Concerning Efficiency and Problems in Cytology . . . . .	168

**Doubtful Cases and Precancerous Lesions. (Indicative List for the Various Methods of Examination, for Surgery, for Observation and for Prophylactic Screening**

M. Classen: Doubtful Cases and Precancerous Lesions . . . . .	173
---	-----

*Discussions by Invitation*

K. Elster: Doubtful Cases and Precancerous Lesions. (Indicative List of Various Methods) . . . . .	176
K. Kawai: Doubtful Cases and Precancerous Lesions . . . . .	177
J. C. Prolla: Indications for the Various Methods of Examination. Clinical Context and Mass Surveys . . . . .	180

**Problems of and Recommendations for Organizing Early Stomach Cancer Diagnosis in Hospitals, Out-Patient Clinics, Doctor's Offices and in Mass Screening**

A. I. Figus: Gastroenterological Welfare Centre and Early Gastric Cancer in Hungary . . . . .	185
K. Kawai, T. Wakabayashi, M. Masuda: Problems Concerning Gastric Mass Surveys . . . . .	199
J. C. Prolla: The Organization of Mass Surveys for Gastric Carcinoma . . . . .	202

*Discussion by Invitation*

M. Crespi, A. Bigotti, S. di Matteo: Problems and Recommendations for Organizing Early Stomach Cancer Diagnosis in Hospitals, Out-Patient Clinics, Doctor's Offices and in Mass Screening . . . . .	204
Report on a Final Round Table Discussion of all Participants. (Recommendations for Future Activities.) . . . . .	206

## Introduction





# Presidential Address

E. Grundmann

Patholog. Institut der Universität, Münster

The first two symposia of our society dealt with epidemiology of cancer and mechanisms of carcinogenesis; as suggested by Dr. Grunze and Dr. Witte, the present one is dedicated to a clinical topic. Both our chairmen have prepared this conference by selecting participants and their papers and by organizing the program of discussions. Dr. Grunze is a member of the society of long standing whose helpful co-operation is always present. Beside him, we have my old friend Dr. Witte, our guest, whom I wish to thank for his readiness to lead this conference and to make his expert knowledge available to us.

Like other malignant disorders, gastric cancer has certain pre-stages where it is still restricted to the mucous membrane. A pioneer in this field of research is Prof. Gutmann of Paris; he was the first to establish the value of early diagnosis for a successful treatment of gastric cancer, and we are honoured by his attendance at this symposium. The same is true for our Japanese colleagues who by introducing the fibroscope, have contributed so much to our understanding of stomach micro-carcinoma. We are glad to welcome Prof. Kawai, Director of the Endoscopy Department of Kyoto University and a representative of this leading gastroenterological school. The German participants of our conference are mainly followers of Prof. Henning and the "Erlangen Group". The mention of this group calls to mind various technical improvements in endoscopy, as well as fundamental cytological and histological studies.

We feel honoured by the presence of our foreign colleagues from Austria, Brazil, France, Hungary, Italy, Japan, Norway and the United Kingdom, who did not refuse the inconvenience of travelling in order to attend this meeting and to participate in our discussion.

I should like to stress the fact that progress in science can only be promoted by the interchange of experience and knowledge in the course of international meetings such as ours today. The "half-life" of scientific knowledge is shrinking rapidly, but this is not the moment for giving up. Our patients are always entitled to get the best treatment available, and that can be guaranteed only by keeping science up to date.

In my capacity as a pathologist and histologist I should like to remind the audience briefly of some facts. In Germany, stomach cancer is still the tumor incurring the highest death rate. It is closely followed by bronchus carcinoma; only a few cities show an inverted relation of these two. High mortality statistics and a discouraging rate of therapeutical success may give rise to a feeling of resignation. The five-year-survival rates are below 10%; the cause seems to be none other than a

lack of early diagnosis. More than 50% of all gastric cancer patients are already in a state of inoperability on the day of their first diagnosis. When they undergo surgery, i. e. radical removal of the tumor and its metastases, these patients are yet bound to die within two years' time.

Survival chances for gastric cancer patients do improve if the tumor can be detected in an early stage. You are all familiar with the progress in early diagnosis of obstetric carcinoma which was made possible by the invention and application of new methods. For the past two decades and under the direction of my predecessor, Prof. Flaskamp, our society has contributed a great deal of leadership and practical help to this campaign. For anatomical reasons, the early diagnosis of gastric cancer is definitely more difficult than that of cervix carcinoma.

This audience will have to discuss and evaluate all future aspects of the problem, notwithstanding many promising developments in radiology, endoscopy, histology and cytology that have recently shown us new paths. Epidemiology of cancer and especially of gastric carcinoma have been topics of an international symposium held by our society last year (GRUNDMANN and TULINIUS, 1972), therefore this item has been excluded from this year's program. Nevertheless, I wish to inform you of some results of the previous conference:

The frequency of gastric carcinoma varies in different parts of the world; in the USA and in Australia it is relatively low, in Japan, Chile, Poland and Germany, the incidence is relatively high. Today, as we are aware that racial components are of no importance, the disparity can be traced back to two factors:

1. The mean life expectancy of the population in general. Stomach carcinoma is a tumor which occurs at an advanced age of the patient, usually above fifty years. Therefore a lower rate of stomach carcinoma will be found in countries with shorter life expectancy. Statistics of Third World countries are influenced by this fact.
2. Environmental factors are important, but nutritional factors and eating habits in particular. In general, inhabitants of cities are in a better position than people living in rural areas, and females are better off than males (STASZEWSKI, 1972).

Fortunately, stomach cancer is on the whole continually decreasing. Death due to a malignant tumor of the stomach has declined in Germany from 54 per 100,000 males in 1956, to 41,8 in 1967. The same decline is evident in other countries, above all in the USA, but also in Japan (DOLL, MUIR and WATERHOUSE, 1970) which has the highest incidence of stomach cancer in the world.

Gynecologists have been great pioneers in the field of early cancer detection, and that is why we have asked Dr. Zinser, one of these pioneers, to give us the first lecture. We have invited him to report on approved models and methods in gynecology in order to provide aims and ideals for which we could strive in gastroenterology.

## REFERENCES

- Doll, R. , Muir, C. , Waterhouse, J. : Cancer Incidence in Five Continents. Berlin-Heidelberg-New York : Springer 1970.
- Grundmann, E. , Tulinius, H. : Current problems in the epidemiology of cancer and lymphomas. Rec.Res. Cancer Res. 39, 1-248 (1972).
- Staszewski, J. : Migrant studies in alimentary tract cancer. Rec.Res. Cancer Res. 39, 85-97 (1972).

# Some Historical and Topical Remarks Made by the Chairmen

H. Grunze and S. Witte

Innere Abteilung der Krankenanstalten, Dürren und Medizinische Abteilung  
des Krankenhauses der Evang. Diakonissenanstalt, Karlsruhe

Early diagnosis of gastric cancer, being a major step towards gastric cancer cure, is a challenge of long duration.

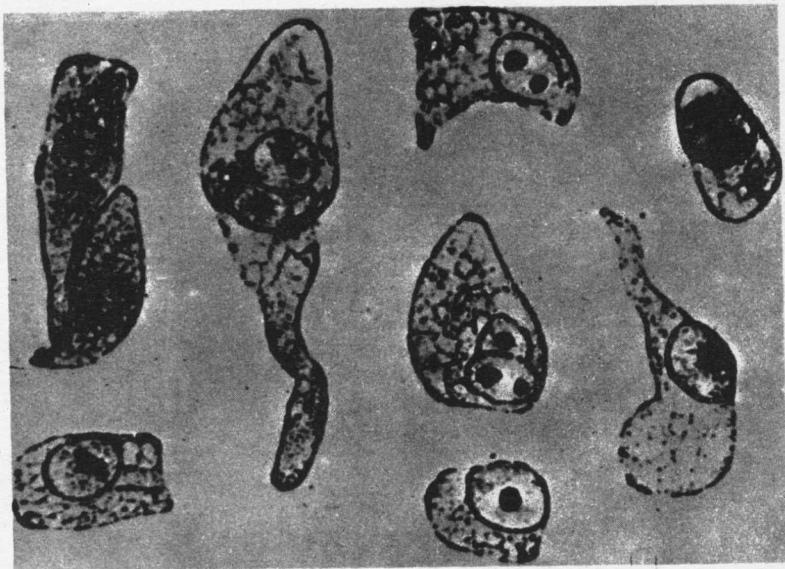


Fig. 1. G. MARINI. Typical tumor cells in a gastric washing (1909)

It was in 1909 (Fig. 1) when MARINI in Bologna decided that in the future, physicians convinced of the usefulness of cytological examinations on gastric washings as firmly as they were already convinced of the value of microscopical analysis of the urine sediment, would no longer retard the diagnosis of a gastric cancer until the tumor is palpable, i.e. in a stage when surgical intervention, if not definitely pernicious, would not be of any use whatsoever.

All efforts for promoting early gastric cancer diagnosis have been listed in a complete survey by WANKE (1971). The names of TURCK (1895), KONJETZNY (1913), PAPANICOLAOU (1947), HENNING (1947) and especially that of Dr. GUTMANN (1932) should be mentioned. It was GUTMANN who together with his Paris colleagues, inaugurated the modern synoptic approach towards early gastric cancer diagnosis, as is documented in Figs. 2 and 3. The widespread use of combined

# LE CANCER DE L'ESTOMAC AU DÉBUT

**ÉTUDE CLINIQUE, RADIOLOGIQUE  
ET ANATOMO-PATHOLOGIQUE**

PAR

**RENÉ-A. GUTMANN**  
Médecin des Hôpitaux de Paris

**IVAN BERTRAND**  
Directeur à l'École des Hautes Études

ET

**TH. J. PÉRISTIANY**  
Assistant à la consultation de gastro-entérologie de la Salpêtrière

**PRÉFACE DU P<sup>re</sup> A. GOSSET**

AVEC 563 FIGURES DANS LE TEXTE

**G. DOIN & C<sup>ie</sup>**  
**ÉDITEURS**

8, PLACE DE L'ODÉON, PARIS - VI<sup>e</sup>  
1939

## **ÉTUDE CLINIQUE**

LES FORMES LATENTES LES FORMES NON DOULOUREUSES  
LES FORMES DOULOUREUSES

## **ÉTUDE RADIOLOGIQUE**

Technique de l'examen radiologique dans le cancer du début par le Dr J. GARCIA-  
CALDERON ..

*Diagnostic radiologique de la niche bénigne et de la niche maligne .....*

## **MÉTHODES D'EXAMEN DIVERSES**

LA GASTROSCOPIE . . . . . LE CHIMISME GASTRIQUE .  
LA RECHERCHE DES HÉMORRAGIES OCULTES

## **ÉTUDE ANATOMIQUE**

IDENTIFICATION ANATOMIQUE DU CANCER  
GASTRIQUE AU DÉBUT

Fig. 2. Photo set-up composed of the front-page and some items of the contents of Dr. GUTMANN'S monography. The modern synoptic approach of this pioneer book is obvious



Fig. 3. = Fig. 436 of Dr. GUTMANN'S Monography: Ulcer with partial cicatrisation and cancerisation. C: Granulomatous ground, B: Adenomatous knot, partly degenerated (left of the arrow). The 3 other arrows indicate epithelial areas being transformed into cancer

radiological, endoscopic and histological examinations of patients in today's diagnostic centres has its precursor in the work of this French research group. Another rapid improvement in diagnostic techniques was stimulated by the gastro-fiberscope which had been originally devised by HIRSCHOWITZ (1958) and was then improved in Japan, where the leading centres of the world for detection of the so-called "early gastric cancer" have been established (Ref. see Monograph ed. by MURAKAMI, 1971).

All over the world, diagnostic results of colleagues interested in early cancer diagnosis are rather promising, as far as single and individual examinations are concerned. Since gastric cancer has a very high frequency it now appears justified to raise the question whether, besides the well-known Japanese efforts towards mass screening, the time may have come for European programs, too. With intention to analyse this problem the "Society for fighting Cancer, North-Rhine-Westphalia" (GBK) has organized this symposium, and all participants have been asked by the chairmen to answer, if possible, the following questions:

1. Which stages of gastric cancer disease have been detected so far?
2. Which technical means, efforts and ways of organisation have been employed in hospitals, outpatient clinics, in the G.P.'s consulting room or in mass screening? In the present stage of development, are there already any propositions for an improvement of procedures such as may result from the participants' own experience?
3. Which difficulties and problems have been met so far?

4. Were the expenditures in various fields of application justified from an economical point of view? Would anybody want to advocate a pilot study on gastric cancer mass screening in Europe, or, which other problem should have priority before such studies were taken up?

#### REFERENCES

- Gutmann, R. A., Betrand, I., Péristiany, Th. J.: Le cancer de l'estomac au début. Paris: G. Doin & Cie. 1939.
- Henning, N.: Die Cytodiagnostik maligner Tumoren. Tagung d. dtsh. hämatolog. Gesellsch. 1947. Fol. hämat. Lpz. 70, 198 (1950).
- Henning, N., Witte, S.: Atlas der gastroenterologischen Cytodiagnostik. Stuttgart: Thieme 1957.
- Hirschowitz, B. I., Curtiss, L. I., Peters, C. W., Pollard, H. M.: Demonstration of a new gastroscope, the "fiberscope". Gastroenterology 35, 50 (1958).
- Konjetzny, G.: Über die Beziehungen der chronischen Gastritis mit ihren Folgeerscheinungen und des chronischen Magengeschwürs zur Entwicklung des Magenkrebses. Bruns Beitr. klin. Chir. 85, 455 (1913).
- Marini, G.: Über die Diagnose des Magenkarzinoms auf Grund der cytologischen Untersuchung des Spülwassers. Eigene Beobachtungen über den normalen und pathologischen Zelleninhalt des Magens. Arch. Verdauungskrankh. 15, 251 (1909).
- Murakami, T. (Ed.): Early Gastric Cancer. Tokyo: University Press 1971.
- Papanicolaou, G. N., Cooper, W. A.: Cytology of gastric fluid in the diagnosis of carcinoma of the stomach. J. Nat.
- Papanicolaou, G. N.: Atlas of Exfoliative Cytology. Cambridge, Mass.: Harvard University Press 1954.
- Turck, W.: Eine neue Methode der Diagnose und Therapie gewisser Magenkrankheiten und bakteriologische Studien bei denselben. Wiener med. Wschr. 1 (1895)
- Wanke, M.: Der Magen. In: Spezielle pathologische Anatomie Bd. II/1, Ed. W. Doerr, G. Seigert, E. Uehlinger. Berlin-Heidelberg-New York: Springer 1971.



# Experiences in Early Detection of Carcinoma Colli Uteri

H. K. Zinser

Frauenklinik des Evang. Krankenhauses, Köln

As you all know, the gynaecologist has at his disposal certain optical methods for detecting cancer in the cervix uteri : colposcopy and colpomicroscopy. Besides these, there is another valuable method, the colpocytology. The advantage of the latter lies in that material for examination can be taken directly out of the areas most susceptible for tumor. The application of these methods is simple. In fact, they can be used in every routine examination, and may be repeated as often as necessary. We see, therefore, that favourable conditions are existing for extensive medical examinations. Their effectiveness and efficiency in cases of cervix cancer shall be critically appreciated.

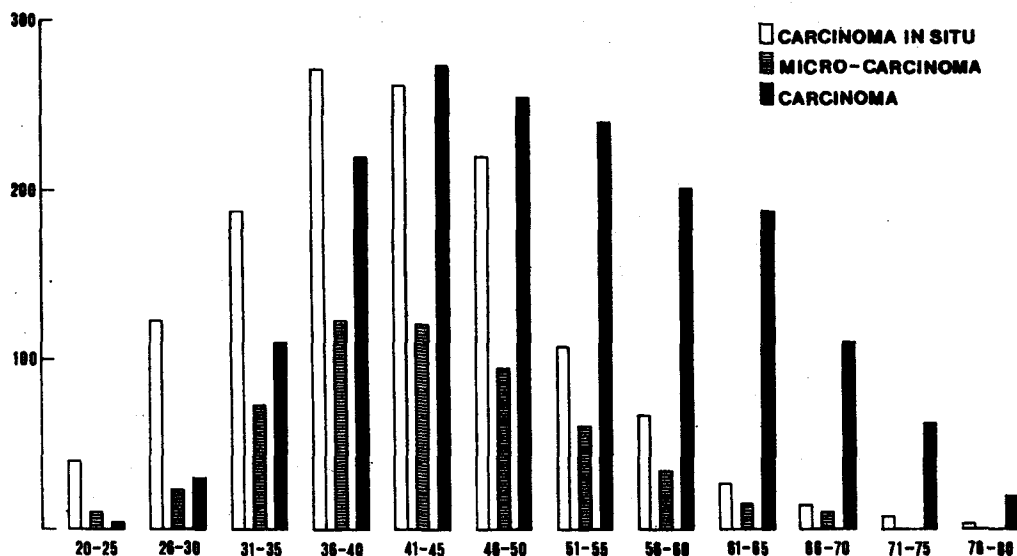


Fig. 1. Age-distribution of 3598 cases (1957 - 1964)

The colposcopic viewing of the ectocervix with magnification from 10 to 40x will give characteristic pictures which, in principle, could be attributed to irregularities in the morphological structure of the capillary vessels. This corresponds to

a variety of atypical epithelium occurring in areas of squamous and columnar epithelium with different behaviour. (Nearly 70% of all pre-cancerous diseases could be recognised optically with the help of acetic acid and SCHILLER's test). However, about 30 % of the atypical epithelia evade the colposcopic viewing because they are hidden intracervically.

After vital staining of the surface of the portio vaginalis with toluidine blue, it is possible to judge, with the help of colpomicroscopy, the structure of the nuclei in the superficial cell layer. There is, in fact, nothing but cytology in vivo to supply the necessary information about the situation in the ectocervix. Its assertive value is almost equivalent to that of colposcopy.

In gynaecology, colpocytology is one of the most important methods for cancer detection. The cytological interpretation of a cervical smear allows differentiation between benign changes of cells derived from metaplastic epithelium and other cell types originating from dysplasia.

From the constituent of cells found in a cervical smear, one can recognize the atypical epithelial proliferations related to carcinoma in situ; finally, a pointer to genuine exuberance of cancer cells can be expected. The indication for a histological examination based on cytological findings, will be laid rather early in the dysplasia stage and not wait for final diagnostic corrective.

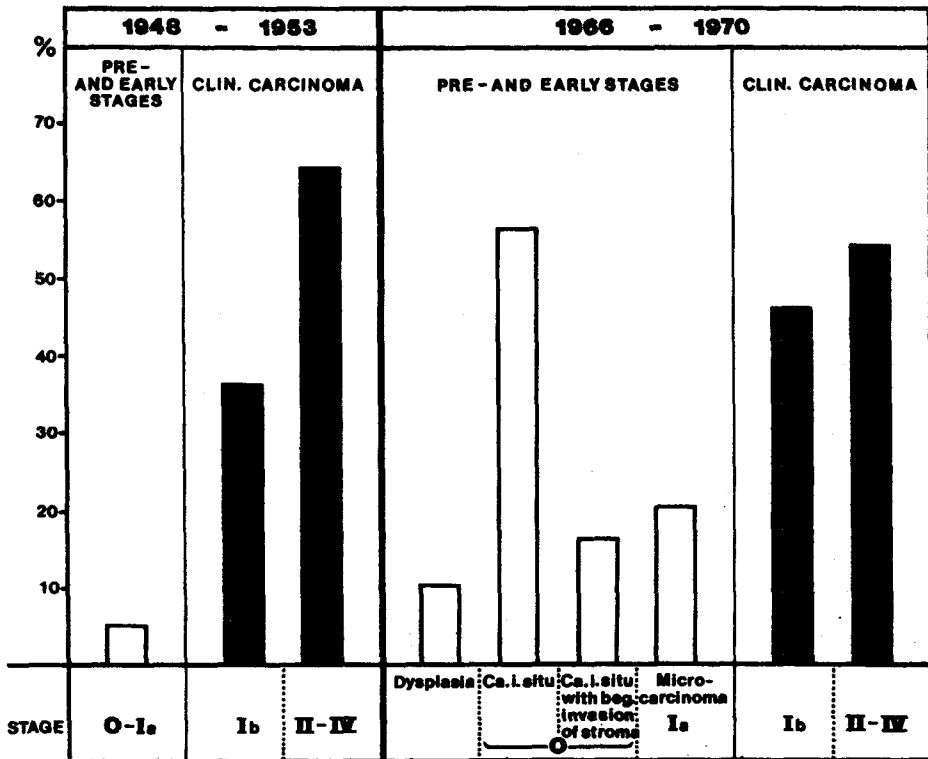


Fig. 2