EARLY DIAGNOSIS OF CANCER OF THE CERVIX UTERI*

BY

MALCOLM DONALDSON, F.R.C.S., F.R.C.O.G.

The diagnosis of any disease starts with the patient, because he or she must in the first case consult the doctor before the latter can do anything, and it is this first step that is so important and so difficult to overcome in the case of carcinoma of the cervix. The first symptom to be noticed is, generally, irregular vaginal bleeding. Harnett (1949) gives its incidence as 67.5%; the next most common symptom is vaginal discharge, 20%. By the time the patients were admitted to hospital 90.5% had vaginal haemorrhage.

Delay in Seeking Advice

The great difficulty in persuading women to regard seriously the symptom of bleeding is because this symptom so often arises from a comparatively trivial cause and is often only transient. The commonest of these is perhaps some slight endocrinal disturbance. As we all know, this is particularly true during the "menopause," and it will be a long time before women recognize that irregular bleeding may possibly be due to cancer. Unfortunately, the idea that this symptom is *normal* is not only handed down from one generation to another, but sometimes is unwittingly encouraged by the busy doctor who says, "Don't you worry; it is *only* the change."

A few figures have been published showing the delay between the first symptom and the time of treatment in cancer of the cervix uteri (Table I), and there are data from the Yorkshire experiment (Table II) which show the delay be-

TABLE I.—Cancer of Cervix Uteri

Harnett's Series (789 Cases)			South-western Regional Hospital Board (300 Cases)		
Delay (Months)	No. of Patients	%	Delay (Months)	No. of Patients	%
0-1	214	27.1	0-3	80	26.6
1-2	101	12.8			
2-3	76	9.6			
3-6	178	22.5			
6-12	126	15.9	3-6	86	28.6
12-24	67	8.5	6-12	50	16.6
Over 24	27	3.4	Over 12	84	28.0

TABLE II.—Yorkshire Experiment. Irregular Vaginal Bleeding: Non-malignant+Cancer Cases (352 cases)

Delay (Months)	No. of Patients	%
0-1	101	28.6
1-3	77	21.8
3-6	56	15.9
6-12	36	10.2
Over 12	82	23.2

tween the first symptoms and the visit to the doctor; but in the latter case these symptoms are due to other causes in addition to proved cancer. A study of these figures shows clearly the terrible delay in visiting a doctor after a symptom is noticed. It is interesting also to note the difference between the figures from the London area, where no cancer education has taken place, from the Yorkshire area, where for two years cancer education has been taking place, and from the south-western area. It is indeed difficult to suggest any reason for the marked difference in the figures from the last-mentioned area.

*Read in the Section of Obstetrics and Gynaecology at the Joint Annual Meeting of the British Medical Association, Canadian Medical Association, and Ontario Medical Association, Toronto, 1955.

Three Important Questions

Questions that arise are: (1) Does the delay that takes place between noticing a symptom and the first visit to the doctor materially alter the prognosis? (2) If the delay is cut down will there be an appreciable increase in the number of Stage I cases treated? (3) Can the delay be reduced by cancer education?

Question 1

Everybody agrees, and all statistics prove, that the prognosis is better when the growth is in an early stage. This is shown in the international figures collected by Heyman (1937-47) between 1937 and 1947. Unfortunately, very few figures have been published showing a correlation between the delay in seeking advice and the stage of the disease. The figures from the South-western Regional Hospital Board (Table IV) show a slight decrease in the number of "clinical Stage I" cases after a delay of three to six months, but a marked difference in the survival rate of these cases.

There are also very few published figures which correlate the delay with the five-year results. Those published by the South-western Regional-Hospital Board and those of Harnett suggest that the prognosis is affected (Table V), but, as will be seen by the answer to question 2, the type of

TABLE III.—Percentage of Cases in Stages I to IV and the Five-year Survival Rate

	% of Cases when First Treated	No. of Patients Treated	Alive with No Evidence of Disease 5 Years Later	%
Stage I	18.9	13,977	8,467	60.6
" II	39.8	29,900	12,455	41.7
" III	34.0	29,028	6,772	23.3
" IV	7.3	8,660	588	6.8
Unclassified	0	11	0	0
	100.0	81,576	28,282	34.7

TABLE IV.—Figures from the South-western Regional Hospital Board Area

Delay	% of First-stage Cases Treated	5-year-survival Rate
0-3 months	25%	65%
0-6 " "	22%	52.6%

TABLE V

Delay	No. of Patients Treated (All Stages)	Patients Surviving 5 Years	%
<i>South-Western Hospital Board: 300 Cases All Stages</i>			
0-3 months	80	31	38.7
3-6 " "	86	28	32.5
6-12 " "	50	21	42.0
Over 1 year	84	22	26.1
<i>Harnett's Cases: 751 Treated Cases, All Stages</i>			
0-3 months	246	82	33.3
3-6 " "	213	60	28.2
6-12 " "	158	56	35.4
Over 1 year	134	32	23.8

growth is also a very important factor. Table V shows a definite deterioration in the results when the delay is extended from three months to six months, but after a delay of six months the prognosis improves. This fact—that some improvement with long delay which is also seen in delay figures dealing with cancer of the breast, although in that site the improvement is noticed as a rule after a still longer delay—has been used on many occasions by people who do not believe in cancer education as an argument against any value in earlier diagnosis. This argument is of course entirely fallacious.

The series of cases treated before six months is composed of patients with tumours that grow rapidly and disseminate early, as well as a number who have slow-growing tumours. The series of cases treated after a longer delay—that is, six

to twelve months—contains a majority of patients in whom the tumours grow slowly and disseminate at a late date. In fact, what has happened is a *selection by death*.

Question 2

If the delay is cut down, will there be an appreciable increase in the number of patients in whom the disease is still in Stage I and therefore curable? As already mentioned, practically no figures have been published in connexion with carcinoma of the cervix to correlate the duration of delay with the stages, except those already quoted; and these do not help in the delay up to one month, as the records are for nought to three months.

There is no doubt that, even if it were possible to persuade every woman to go to the doctor within a week of the first symptom, the cancers diagnosed would be found to be distributed over "all four stages," but in what proportion these would be found it is impossible to say. It is probable that Stage I would predominate; and certainly Stages I and II combined would exceed Stages III and IV.

This is really the crux of the problem on cancer education. The Canadian statistician McKinnon has written many articles on this subject in connexion with cancer of the breast. A fair summary of his ideas, I think, is that he believes cancers to be of two types: (a) "lethal," in which the growth disseminates before symptoms arise, and for which no curative treatment is possible; and (b) "non-lethal growth," which never disseminate and kill only by local spread, and for these early diagnosis is not required. Incidentally, much of his argument is based on mortality rates, but there are so many factors concerned in mortality figures that I do not think these are valid evidence. I believe there is a great deal of evidence to show that all rates of growth and times of dissemination occur between these two extremes (Donaldson, 1952), and, therefore, the earlier the condition is diagnosed the greater will be the number of patients cured. At present there is no evidence to show, even approximately, how many more women would be saved by early diagnosis.

Question 3

Can the delay be overcome by cancer education of the public? I have recently completed a pilot experiment in Yorkshire on this subject, and, although this lasted for only two years, there is some evidence that the delay is slightly less than before the experiment started.

Is there any alternative to cancer education? Periodic overhauls are being tried out in the U.S.A. Personally, I think this will prove to be an impracticable ideal. The small number of unsuspected cases that are found does not in my opinion justify the expenditure of so much time by doctors and technicians. Even the published figures of the number of unsuspected cases discovered are not accurate, because by definition these patients are supposed to have no symptoms when they enter a cancer detection clinic. During the afternoon I spent at one of these clinics I saw a woman examined who had denied any symptoms previously; she now confessed that she had had irregular bleeding and knew it was possibly a symptom, but she also knew that in this clinic she could get the best possible examination.

To sum up the question of delay, therefore, I believe that, as we do not know when in any particular patient the growth will disseminate, it is essential to persuade women that *irregular bleeding may be of vital importance* and that they should report it to the doctor at once. If cancer education is carried out in this way many lives will be saved each year.

Points in Diagnosis

The first point to emphasize is the taking of a careful history. It is of course a golden rule that any patient complaining of irregular bleeding must be considered to be a cancer case until this is disproved. I make no apology for mentioning such an obvious point, because a clear

history can be very difficult to obtain when interviewing a garrulous old woman; judging by the clinical notes, many practitioners give it up in despair, and send the patient to the hospital gynaecologist with a visiting-card requesting treatment. That would not matter very much, but the gynaecologist often puts down only enough notes for him to recognize the case the next time he sees it. At the end of five years, when he or someone else wishes to get out statistics, such information will be quite useless. Personally, I like to use clinical sheets with printed headings.

My next point is also an obvious one—namely, that the patient must be examined fully and not only the affected organ. Most of us have, I expect, been guilty of this "sin of omission" at some time. I remember on at least one occasion diagnosing a patient as suffering from "first-stage" carcinoma of the cervix, only later to find extensive secondary deposits in both lungs. Personally, I start at the patient's head and work downwards, and more than once have discovered an early breast cancer. It is perhaps unnecessary to stress the importance of a rectal examination; indeed, a bimanual examination cannot be properly carried out unless this is done.

Turning now to the cervix itself, there are three special tests that must be discussed.

1. *Cytological examination* by means of smears has been carried out extensively in the U.S.A. and Canada. In England we are only just beginning to take it seriously, and the Royal College of Obstetricians and Gynaecologists, with the help of the British Empire Cancer Campaign, is subsidizing units in some of the main gynaecological centres. Although I do not believe it will ever be possible to "screen" the whole population annually, this test is undoubtedly of great value as an aid to early diagnosis. The percentage of "false positives" and "false negatives" varies considerably in different clinics, but it is, of course, the latter that are important. A "false positive" only leads to renewed efforts towards diagnosis, but a "false negative" may give rise to a false reassurance. The figures for false negatives may reach 10%.

2. *The Schiller iodine test* was started about 1933 and depends on the fact that the cancer cells, being deficient in glycogen, do not stain. Unfortunately there are other types of cell which also fail to take up the iodine, and by itself the test is of little value.

3. *The colposcope*, which was invented about 1925 by Hinselman and has been in use for many years in Vienna, is only just beginning to be used in England. Professor Strachan, in Cardiff, and Mr. J. D. Andrew, at St. Bartholomew's Hospital, are both employing it. There is little doubt that it is a valuable aid to early diagnosis and enables a more reliable section to be taken. One of the diagnostic factors that can be seen through this instrument is the "corkscrew" formation of the blood vessels. The iodine test is sometimes used with this machine. A modification of the colposcope incorporates a microscope; it has been suggested that this combination may take the place of smears, but this is unlikely.

In conclusion I would reiterate that "early diagnosis" is of the utmost importance, and *will* produce more "early-stage" cancers: this is essential if the best results in the treatment of cancer of the cervix uteri are to be obtained.

NOTE.—Since this lecture was written, I had an opportunity, while in Canada, to attend in Ottawa the annual meeting of the Canadian Cancer Society, and stayed in that city for several days as its guest. Later I visited the headquarters in Toronto, and learnt a great deal about this splendid society. I was greatly impressed by the very efficient organization and the keenness of all concerned. The population of the whole of Canada is not more than fourteen million, yet the society has more than 368,000 voluntary workers. The work of these people is not confined to cancer education; they do, in addition, a great deal of welfare work in connexion with cancer patients, and help to collect money. During 1954 they collected \$1,623,958, and this, together with bequests and investments, brought the income up to \$1,768,189. Of this sum \$338,974 (approximately £118,641) was entirely spent on cancer education—a striking contrast to the

amount of money spent in this country, with a population of nearly 50 million. In Ontario the department of health has published figures showing that the percentage of patients treated in stage 1 carcinoma of the cervix increased from 24.4% in the period 1943-7 to 31.7% in the period 1948-52. Even more striking figures are published in Saskatchewan, the rise in stage 1 between 1932 and 1949 being 10% and the rise in stages 1 and 2 combined from 55% in 1932 to 82% in 1949. The Canadians are convinced of the value of cancer education in obtaining treatment at an "early stage" of the disease.

REFERENCES

- Donaldson, M. (1952). *Publ. Hlth (Lond.)*, 65, 169.
Harnett, W. L. (1952). *Brit. Emp. Cancer Campgn Survey of Cancer in London*.
Heyman, J. (1937-47). *Annual Reports on the Results of Radiotherapy in Cancer of the Uterus*. League of Nations, Geneva.

Preparations and Appliances

AN OBSTETRIC BED

Mr. PERCY MALPAS, F.R.C.S., chairman of the medical board, Liverpool Maternity Hospital, writes: An obstetric bed must meet certain well-defined criteria. The first is comfort for the patient, who may have to occupy it for twenty-four hours or so. Its weight and mobility must be such that staff can move and clean it easily. The bed must

be readily adaptable to any position required for an obstetric operation without undue lifting and moving of the patient. In practice this requirement demands that the bed can be readily divided or "broken," and the lower end pushed out of the way, also that an adequate Trendelenburg position can be obtained quite quickly. The

height must be such as to permit of the application of forceps with comfort, the width such that control of the patient during a normal delivery is assured. Finally, there should be no loose parts to be stored elsewhere.

With these desiderata in mind the staff of the Liverpool Maternity Hospital have devised the obstetric bed shown in the illustrations. The overall length is 7 ft. (2.1 m.), and when divided for the lithotomy position the length is 4 ft. 2 in. (1.3 m.). To break the bed the lower portion slides under the upper. The overall width is 3 ft. (0.9 m.).

The overall height, including a 3-in. (7.5-cm.) thick rubber mattress, is 2 ft. 6½ in. (0.76 m.). The top or "base" is detachable. For lightness and convenience of cleansing it is made of a plastic material. The leg supports, when not in use, fold backwards along the sides of the frame. The shoulder-rests are built-in, sliding on rods fixed to the top edge of the bed. This keeps them out of the way of staff working at its sides. A Trendelenburg position of 40 degrees from the horizontal is obtained by a hand-operated wheel. The head-rest, which normally supports the pillow, can be lifted out when required for the administration of an anaesthetic. The bed is mounted on rubber-tyred castors, 5 in. (12.5 cm.) in diameter. It is locked by two foot-plates operated by two hand-wheels; these latter are easier for midwives to operate than the usual foot-operated pedals.

A prototype of the bed was in constant use in our labour ward for a year. The modifications found necessary concerned in the main the simplification of the controls. The redesigned model has been in constant use for four months and has proved so satisfactory that all the old obstetric beds in the labour ward are to be replaced.

The bed was made for us by Messrs. Elliotts Liverpool Limited, to whom, and particularly to their manager, Mr. Turner, and their technical engineer, Mr. Howell, the Board is much indebted.

Nova et Vetera

"THE PRIVATE PESTILENCE"

At a meeting of the Boston Society for Medical Improvement the case was discussed of a physician who had died within a week of accidentally wounding himself while conducting a post-mortem examination on a case of puerperal fever. A number of women who had been attended at their confinements by this practitioner in the few days before his death subsequently developed puerperal fever.

The discussion so interested a member of the Society that he was stimulated to gather any available information bearing on this apparently contagious aspect of the disease. Thus came Oliver Wendell Holmes to collect the material for his lecture entitled "The Contagiousness of Puerperal Fever," which he delivered at the next meeting of the Society.

This outstanding contribution to obstetrics was published in April, 1843, in the *New England Quarterly Journal of Medicine and Surgery*, but it was not until 1855, when it was reissued as a pamphlet with the title "Puerperal Fever as a Private Pestilence," that this compelling collection of evidence demonstrating the contagiousness of the disease became readily available and more widely known to the medical profession. More recently it has been published in *Medical Classics*.¹

The infectious nature of puerperal fever was suggested by John Burton² in 1751, and again by John Leake,³ who in 1772 wrote: "The child-bed fever, when produced by a dis-temperature of the air, like the epidemical dysentery or ulcerous sore throat, may at last become infectious." However, it is the *Treatise on the Epidemic Puerperal Fever of Aberdeen* of Alexander Gordon (1795) which for the first time sets forth indisputable evidence of the transmissibility of this disease and the necessity for disinfecting nurses and

¹ *Medical Classics*, 1936, 1, 211, 245.

² Quoted in Garrison and Morton's *Medical Bibliography*, 2nd ed., p. 548, 1954.

³ *Practical Observations on the Childbed Fever*, by John Leake, 1772. In *Essays on Puerperal Fever and other Diseases Peculiar to Women*, edited by Fleetwood Churchill for the Sydenham Society, p. 169, 1849.

⁴ In appendix to *A Treatise on the Epidemic Puerperal Fever as it prevailed in Edinburgh in 1821-22*, by William Campbell, Edinburgh, 1822.

⁵ First part of *The History, Pathology, and Treatment of Puerperal Fever and Crural Phlebitis*. E. Barrington and G. D. Haswell, Philadelphia, 1842. (Not consulted.)

⁶ In *Essays on Puerperal Fever and other Diseases Peculiar to Women*, edited by Fleetwood Churchill for the Sydenham Society, pp. 445-496, 1849.