THE BRITISH CLINICAL STAGING OF BREAST CANCER

BY

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The need to classify cases of cancer of the breast has long been recognized. Probably the first staging, which took into account the patient's age, the extent of the disease, and the histology, as well as lactation or pregnancy, was that of Lee and Stubenbord (1928). This was adjudged to be too unwieldy, and the staging which gained most acceptance was that of Portmann (1937, 1943). In this country the Manchester modification of the Steintal staging (Paterson, 1948) has been most popular, but several centres—for example, Edinburgh and the Royal Marsden Hospital (formerly the Royal Cancer Hospital)—introduced their own modifications. There are to-day, in general use in Britain, no fewer than five similar but differing classifications, differing in sufficient detail to make the accurate comparison of series largely impossible.

In 1953 Dr. P. F. Denoix, of Paris, suggested a new approach to the problem, and this forms the basis of the present communication. It is not necessary to go into details of the discussions which have taken place at various international meetings in the past five years. It is sufficient to say that these have now reached a stage at which it can be expected that international agreement will certainly be achieved.

Three years ago letters were published in the *British Medical Journal* and the *Lancet* (Harmer, 1955) pointing out that the International Union against Cancer would be meeting in London in July, 1958, and expressing the hope that before that date British surgeons and radiotherapists would meet, argue, and agree upon a clinical staging so that this country at least could speak with one voice in any international discussion.

A Joint Committee

The suggestion gained wide approval, though this was tinged with some scepticism. In the event, the Association of Surgeons and the Faculty of Radiologists agreed to sponsor the idea, and the council of each body delegated five representatives to serve on a committee to thrash out the matter. Mr. Richard Handley, London, was elected chairman, and the other members of the committee were: Mr. Hedley Atkins, London; Dr. George Blomfield, Sheffield; Professor John Bruce, Edinburgh; Mr. Michael Harmer, London (secretary); Dr. Ralston Paterson, Manchester; Mr. Victor Riddell, London; Professor David Smithers, London; Professor Robert McWhirter, Edinburgh; and Dr. Ivor Williams, London.

In his introduction to the memorandum which was finally submitted to the Association of Surgeons and the Faculty of Radiologists, Mr. Handley wrote:

"The staging of breast cancer is an attempt to formulate the extent of the disease. By staging, it is hoped to sort patients from different centres into comparable groups and thus to be able to compare the effects of treatment. It is also hoped that staging may help to guide treatment in individual cases and will give some indication of prognosis.

"Staging may be done on a clinical or a pathological basis. Surgeons, in recording their results, have usually used pathological criteria for staging because they believe them to be more accurate. At the present time there is a swing towards more conservative treatment, and there are thus many patients for whom adequate pathological data are not available. For these and other reasons, therefore, the staging of breast cancer on

clinical grounds is of increasing importance. *It must be emphasized that this report deals only with clinical staging.*

"The Committee is well aware that clinical staging is inaccurate. It takes no cognizance, for example, of tumour malignancy or of host resistance. It is impossible to be accurate in the examination of the axilla, and the more obese an axilla the more inaccurate its clinical examination. Clinical examination can offer no light whatever on the state of the mediastinal lymph nodes. The Committee nevertheless believes that clinical staging, done in the manner to be detailed, is the best method available in the circumstances; that it is well worth doing, and that it is likely that some of the inaccuracies will be ironed out in large series of patients.

"Fundamentally there are four stages into which it would be desirable to divide cases of breast carcinoma: (1) where the tumour is confined to the breast; (2) where the tumour is confined to the breast and its axillary lymphatic drainage area; (3) where the tumour has spread beyond the axilla but is not generally disseminated; and (4) where there is wide dissemination."

Mr. Handley then went on to point out that several stagings already exist and that any recommendations for general adoption must be based on what has come to be called the TNM system, proposed by Denoix and approved by the Research Council of the International Union against Cancer (1956).

The TNM System of Staging

A few words explaining this system are necessary. It is based upon two principles, which may be applied to cancers at many sites but which are particularly suitable for accessible growths and therefore for carcinoma of the breast. These principles are: (1) The identification of cases comprising the group under study by assigning to each case certain symbols denoting the local extension of the primary tumour (T), the condition of the regional lymph nodes (N), or the presence of distant metastases (M). (2) The establishment of conventional stages, usually four in number, by grouping the cases according to the symbols allotted, which in turn indicate the progression of the lesion in regard to prognosis and the particular characteristics of each site.

It is the exact definitions of T, N, and M which are of cardinal importance in this system. This is only another way of stressing the importance of accurate note-keeping and recording of physical signs.

In fact, an accurate assessment of T, N, and M is of greater importance than the process of staging. Whereas the former is based on fact, the latter is an inference of what the facts mean. As experience accumulates, it may become desirable to alter the system of staging, which could be done retrospectively if T, N, and M had been defined in the necessary detail.

For cancers of the breast each component—T, N, and M—is subdivided into four gradations, according to its stage of advance. Thus T1, T2, T3, and T4 represent degrees of advance in the primary tumour, while Na, Nb, Nc, and Nd represent degrees of advance in the local lymph nodes. In subdividing the distant metastases into M1, M2, M3, and M4, it would be fairer to consider them as different categories, rather than degrees of advance, in a process which is already very advanced. Having defined the facts of an individual patient's disease in terms of T, N, and M, the clinician proceeds to the second step of grouping the resulting T, N, and M symbols into four stages, in such a way that the limited growths are in stages I and II and the advanced growths in stages III and IV.

At first sight all this may appear impossibly complicated, but a little thought should dispel such a gloomy impression. In fact, one is only asking clinicians to spend a little more time in recording the details of their patients' disease.

Proposals for Staging

The following proposals accord very well with those of the International Union against Cancer and are therefore, we believe, likely to be accepted. It would clearly be quite useless putting forward anything very different unless

British surgeons and radiotherapists were prepared to demand a system of their own.

The five basic principles which guided the committee in its recommendations were: (a) there should be four degrees of T, named T1, T2, T3, and T4; (b) there should be four degrees of N, named Na, Nb, Nc, and Nd; (c) there should be four degrees of M, named M1, M2, M3, and M4; (d) the definitions of these various TNM degrees should be clearly set out; and (e) the disease may then be staged in the conventional manner by grouping the symbols in a number of stages.

The Council of the Association of Surgeons and the Council of the Faculty of Radiologists make the following proposals for the definitions of T, N, and M and for the four stages.

Definitions

- T:** *T1* Skin fixation absent.
Pectoral muscle fixation absent.
Chest wall fixation absent (*Note 1*).
T2 Skin fixation incomplete (tethered or dimpled), or Nipple may be retracted (in sub-areolar tumours), or Paget's disease may be present.
Pectoral muscle fixation not complete.
Chest-wall fixation absent.
T3 Skin fixation complete (infiltrated or ulcerated), or Peau d'orange present in tumour area, or Pectoral muscle fixation complete.
Chest-wall fixation absent.
T4 Skin involvement or peau d'orange wide of tumour but not beyond the breast area, or Chest-wall fixation present.
- N:** *Na* No homolateral axillary nodes palpable.
Nb (i) Homolateral axillary nodes palpable but not significant (*Note 2*).
Nb (ii) Significant homolateral axillary nodes palpable but movable.
Nc Homolateral axillary nodes fixed (to one another or other structures), or Oedema of the arm.
Nd Homolateral supraclavicular or infraclavicular nodes movable or fixed.
- M:** *M1* Skin involvement wide of the breast, but no other distant metastases.
M2 Involvement of contralateral breast, axilla, or supraclavicular region, but no other distant metastases.
M3 Bone metastases only.
M4 All other distant metastases or any combination of M1, 2, or 3.

Notes

1. The chest wall includes the ribs, intercostal muscles, and serratus anterior muscle. It does not include the pectoralis muscles.
2. Lymph nodes are called significant if they are considered to contain growth.

Naturally, the question of the size of the primary tumour was discussed. It was felt that it would be difficult to include this in the definitions without adding further complexity, and it was argued that, if the size was included because of its influence on prognosis, then the situation of the tumour would also have to be taken into account. It should go without saying, however, that these two facts ought always to be included in the clinical description.

On the matter of the significance of axillary lymph nodes there has always been, and probably always will be, disagreement. It may appear clumsy to divide Nb into two categories, but it was felt that this could be done without prejudice to the definitions as a whole and therefore could be adopted or not by the clinician at will. It is a fact that lymph nodes may be palpable in the axillae of normal people, and palpable nodes in patients with breast cancer may be free of growth. The word "significant" is used to indicate that nodes are considered by the examining clinician to be malignant. As all staging is a matter of clinical judgment, this proviso was included only so that patients with insignificant nodes should be placed in an earlier rather than a later stage. After a great deal of attention

had been given to this matter it was thought necessary to divide Nb in order to satisfy the views of those who believe that the significance of nodes can be judged clinically and of those who believe that all palpable homolateral nodes should be regarded as containing growth.

It was also agreed that when tumours are present in both breasts the definition should be M2.

It may be said that there is not much point in subdividing M. But already where this has been done on a small scale it has become apparent that there is indeed something to be gained from so doing. In some series it is surprising that the percentage of survivors in stage IV is so high, higher sometimes than those in stage III. The reason is that these survivors may be M1 cases where the disease, though extensive, is in fact still localized and may respond well to hormone therapy. Again, a solitary bone metastasis (M3) may be the only evidence of spread and may be treated with success. The division of M does therefore allow the comparatively few survivors in stage IV to be analysed.

Stages

- Stage I:** Skin fixation absent (T1) or incomplete (T2).
Nipple may be retracted (T2) or Paget's disease may be present (T2).
Pectoral muscle fixation absent (T1) or not complete (T2).
Chest-wall fixation absent.
No homolateral axillary nodes palpable (Na).
- Stage II:** Primary tumour as in stage I (T1 or T2).
Homolateral axillary nodes palpable but movable (Nb (i) or Nb (ii)).
- Stage III:** Skin fixation complete (T3) or skin involvement wide of tumour (T4).
Peau d'orange present in tumour area (T3) or wide of tumour (T4),
or Pectoral muscle fixation complete (T3),
or Chest-wall fixation present (T4).
Homolateral axillary nodes fixed (Nc),
or Oedema of arm (Nc),
or Homolateral supraclavicular nodes movable or fixed (Nd).
- Stage IV:** Skin involvement wide of breast (M1),
or Involvement of contralateral breast, axilla, or supraclavicular region (M2),
or Bone metastases (M3) or other metastases (M4).

It may be objected that each of the stages as set out above includes several different sorts of growth. For instance, stage I includes not only the very "early" cases but also some of those which by most standards are considerably more advanced—that is, where the growth is beginning to invade the pectoral fascia as shown by "incomplete fixation."

Again, stage III contains cases which may be locally advanced but otherwise not disseminated as well as those with fixed supraclavicular nodes which are usually included with stage IV.

The answer to such criticism lies in repeating that an accurate assessment of T, N, and M is of greater importance than staging. Unless a larger number of stages than the conventional four is to be adopted, then numbers of dissimilar patients are bound to be grouped together. If the stages are much subdivided, then in effect the particular stage becomes identified with a particular T, N, or M connotation. Thus a clinician interested in the survival rates of patients having really limited growths would describe the features not of stage I cases but of T1Na cases; and all his colleagues would instantly understand what he meant.

Four stages, however, do form a convenient means of grouping patients, and in any publication dealing with the TNM method it is usual to add a simple table indicating the various stage groupings. Thus:

- Stage 1:* T1Na T2Na
Stage 2: T1Nb T2Nb
Stage 3: T3Na
 T1Nc or Nd T2Nc or Nd
 T3Nb or Nc or Nd T4Na or Nb or Nc or Nd
Stage 4: Any combination of symbols including M.

Discussion

Such are the proposals relating to the staging of carcinoma of the breast. It must be emphasized again that these are based on a general system which commands international support and on particular definitions which already have the approval of the International Union against Cancer and which are to be discussed at the Seventh International Cancer Congress meeting in London in July.

British surgeons, perhaps more so than radiotherapists, are on the whole unaware of the TNM system of staging, and the committee is particularly anxious that as wide publicity as possible should be given to it before the Congress meets. To this end it is being published with the title of the *British Clinical Staging of Breast Cancer*. It is hoped that this article will stimulate discussion and criticism. It is further hoped that whoever is asked to speak for Britain in the committee appointed by the International Union against Cancer to discuss the matter will have the backing of surgeons and radiotherapists throughout the country.

Summary

A clinical staging of breast cancer is described.

This is based on the TNM system described by Denoix, of Paris.

There is no suggestion that these proposals should be adopted at this moment. But an attempt to gain international agreement on this matter will be made at the Seventh International Cancer Congress meeting in London in July.

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Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Serial Cholecystography

SIR,—As nobody else has done so, I should like to comment on the article on serial cholecystography by Mr. J. Dudfield Rose (*Journal*, February 15, p. 360). The method described involves the use of 19 x-ray exposures. I have obtained measurements of the surface dosage which would be received by a patient of average size during this examination. The dosage amounts to 88½ roentgen units.

The International Committee on Radiation Protection has recommended that the total dose in 10 years shall not be more than 50 r.u. Three out of four of the cases quoted in the article were women still within child-bearing age. The exact implications are rather complicated, but there is sufficient in the simple facts to cause us to consider seriously whether such a procedure is justifiable.—I am, etc.,

Stoke-on-Trent.

C. BELLAMY.

Disease Education by the B.B.C.

SIR,—Tuberculosis in our hands! Is the B.B.C. determined to avoid all mention of sane prevention if there is no element of the cruel or the gruesome? No mention of adequate sleep, a good meal instead of tea and cigarettes, exercise in the fresh air, open windows at home and at work, guarding the mouth when coughing, forbidding spitting in public places? A glancing murmur only about

active immunization, a cruel dissertation on the dangers of keeping one's elderly relatives at home—much safer away in an institution. And the rest—first catch your tuberculosis, have it diagnosed early, and "so long as you always take your pills, dear, you'll be all right." Balderdash—no wonder the doctors wish to remain anonymous.—I am, etc.,

Cromer.

A. HENRY GREGSON.

SIR,—Although I have no television set of my own, I managed to see several of the programmes from *Your Life in Their Hands*. I am convinced that television is a very valuable medium which has come to stay, and therefore must be used to advantage.

The programmes I have seen, on the whole, have been presented well, but in my opinion emphasis has not been placed sufficiently on the preventive side of medicine. Very excellent diagrams of the airway and oesophagus were shown in the programme on poliomyelitis, and also the highly technical manner in which the airway was maintained by means of a cuffed endotracheal tube in bulbar cases. Since inhalation of regurgitated stomach contents is one of the commonest causes of death under anaesthesia, I feel it was an opportunity missed not to have stressed the importance of abstinence from food or drink for at least three hours before administration of an anaesthetic. What a change it would be if the patient were to volunteer that he had had food instead of one having to cross-question him at great length on this subject.

I was very interested in the programme from Edinburgh, but what a pity the head injury described was said to have been sustained on the football field! What a lot of good might have been done if more had been said about head injuries of a serious nature due to motor-cycle accidents! Everyone working in hospitals is familiar with the large number of surgical beds occupied by patients suffering as a result of this sort of accident.—I am, etc.,

Maidstone, Kent.

SILVIA W. PYDDOKE.

SIR,—After reading the various conflicting opinions about the series *Your Life in Their Hands* one can only quote the old Latin tag *Quot homines, tot sententiae*. However, of what value is the opinion of some medical pundit who rarely comes into contact with the general public? His may possibly be *vox dei*, but is it necessarily *vox populi*? One has very little means of ascertaining. To ask casual patients gives little real indication. To the many people who attend hospital all the voices they hear there are *voces deorum*, even that of the newly qualified houseman, and they would only express an opinion which they thought would be in keeping with that of their mentors.

Many years ago when I first qualified I used to try to teach young mothers who could not feed their babies themselves the method of modified cow's milk as taught by the distinguished paediatrician of my teaching hospital. Only very few of the more intelligent carried out my instructions, the rest merely going away and buying a tin of condensed milk. There must be many doctors like myself who, as a sort of corollary to any advice they may give their patients as to their existing illness, often try to explain to them the nature of it, as well as how to prevent it if possible in the future. To the more intelligent this is obviously welcome, but in the case of others like the foolish young mothers referred to above one felt that they were merely saying to themselves, "Oh! cut the cackle and get on with the cure."

The public are quite disease-conscious enough as it is. After all, in spite of all the cancer propaganda we have had for years, women still come in with hopelessly inoperable cancer of the breast, and ignore advice about returning if a uterine haemorrhage does not clear up in a week or two, and these are often relatively young women in the 50's. Moynihan used to say, "We mustn't frighten people to death, we must frighten them to life." The reason usually given for delay in these women is almost always the same—the fear of operation. Will the present series do anything to banish this? I much doubt it. Many