THE PLACE OF CLINICAL DEMONSTRATIONS IN THE TEACHING OF ANATOMY

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Anatomy has been defined as "the branch of science which deals with the macroscopic and microscopic structure of living things, with the way in which structure is related to function and with the processes by whch structure has evolved in the species and developed in the individual*". Anatomy as a Science is a broader discipline than Anatomy in its relation to Medicine. Medical Anatomy is that aspect of Anatomy taught to medical students with the purpose of providing for their future needs as medical practitioners.

Preclinical teaching of Anatomy should strive to achieve, as its main aims, the realisation by the medical student that through the understanding of the normal structure of the body any interference with normal morphology at once becomes apparent, so enabling one to anticipate any functional disturbances which may result therefrom; and, lastly, that the clinical signs and symptoms of diseases as well as the rational use of the methods for their examination and treatment are founded on an anatomical basis.

In the preclinical teaching of Anatomy emphasis should, therefore, be laid on the fact that:

1. Anatomy deals with the living body.
2. Structure must be correlated to function.
3. Anatomy is the basis for the understanding of disease processes.

What follows is a discussion of the use of clinical demonstrations in the teaching of Anatomy, an assessment of their benefits and possible pitfalls, and an account of the problems involved in the organisation and selection of cases for such demonstrations.

At clinical demonstrations in Anatomy suitable patients from the clinics or wards are demonstrated to students at the preclinical level. The anatomist, in conjunction with other preclinical and with the clinical teachers and making use of hospital records, clinical examination, X-Rays and other specialised investigations, demonstrates the various abnormalities of structure and function and then illustrates and emphasizes the anatomical aspects of the clinical problems involved, without however referring to the pathological significance of the conditions and without in any way involving the student in matters of differential diagnosis or treatment. The student thus faced with a living subject, is enabled to correlate structure to function and to appreciate the relationship which Anatomy has to the problems of clinical medicine. It is because clinical demonstrations fulfil so completely all three main aims sought for in the teaching of preclinical Anatomy that, I feel, their use finds an important place amongst the various methods employed for this purpose.

The use of clinical demonstrations benefits the preclinical student in various ways. The student is made aware that Anatomy deals with the living functioning body. Faced with dead bodies in this dissecting room and with histological preparations in the laboratory, the student is apt to forget that the cadaver is dissected only as an approximation of the

* Memorandum of evidence to the G.M.C. on the medical curriculum by the Council of the Anatomical Society of Great Britain and Ireland (1965).

living body and that the human body is not solely a series of histological sections or a number of charts. Clinical demonstrations bring the preclinical student face to face with living functioning patients so making him apply and visualise the anatomical knowledge he has acquired from the cadaver to the living subject opposite him. What was a static science dealing with lifeless structures thus becomes the dynamic morphology of intact man.

An opportunity is given to the student at such demonstrations to integrate structure and function. Using clinical patients one can demonstrate disturbances of structure and, as a natural consequence, one can then illustrate the functional disturbances which result from such altered morphology. The student is thus unconsciously made aware of the fact that, just as in disease so in health, structure must always be correlated to function. Such horizontal integration helps to break down the artificial barrier which very often exists between Anatomy and Physiology.

The integration achieved is, however, not only horizontal but also vertical; I refer to the integration which clinical demonstrations promote between the preclinical and clinical stages of the student's medical school career. The student comes to realise that Anatomy is the basis for the later understanding of disease processes, the scaffolding on which the structure of disease is built. He becomes aware that disease represents but a deviation from the normal and realises that the range and limits of normal variations must be known if he is to appreciate his later studies of abnormal, that clinical phenomena can be understood and remembered on simple anatomical grounds, and that therefore his subsequent understanding of disease will largely depend on the anatomical knowledge gained in the preclinical period.

Unfortunately there is very often a relative isolation between the preclinical and clinical disciplines so that the student often comes to think of these subjects as isolated branches of knowledge and not different facets of one study. Clinical anaatomy demonstrations serve to emphasize for the student the importance of cohesion and unity which should underlie these two stages. Their use prepares the student to make a smooth and unbroken transition from the familiar and normal of the preclinical stage to the unfamiliar and abnormal of the clinical stage. They therefore help to bridge the chasm which often exists between the preclinical and clinical sections and instil into the student's mind a sense of the unity of Medicine.

The student often finds that he makes his first acquaintance with the method of history-taking and with the technique of the clinical examination of patients at clinical demonstrations. Students are occasionally asked to elicit a history from a patient during a demonstration; more often however they learn the method of history-taking by listening to the clinician interrogating the patient.

The student is also introduced to the clinical methods of examination by the use of inspection, palpation, percussion, sometimes auscultation, and occasionally to the use of special methods of examination and investigation (as the examination of the eye, the interpretation of normal and abnormal X-Ray pictures, E.C.G.'s, etc.).

Early contact with patients at clinical demonstrations and the observation by students of how clinicians treat their patients, helps to lay down a good early groundwork in doctor-patient relationship. The student thus early on gets into the habit of being sensitive not only to the patient's medical requirements but also to his non-medical needs and comforts.

More important to the immediate needs of the preclinical student is the help which clinical demonstrations afford him in actually acquiring the factual knowledge of Anatomy. This they do in several ways.

The study of Anatomy becomes more enjoyable as these demonstrations orientate preclinical Anatomy to a vocational or productive purpose. One must admit that Anatomy is a dull subject for a student who knows nothing else but Anatomy. Clinical demonstrations give the student an opportunity of understanding the purpose behind some, at least, of the material he has to learn so that his approach to

Anatomy becomes motivated to a purpose and its study therefore rendered more interesting. He no longer feels, as is often the case, that Anatomy is but a hurdle to be cleared before the 'real' Medicine is started in the wards; a glimpse of the clinical life ahead of him, on the other hand, instils into him a professional spirit which makes the study of Anatomy relevant to the outside world.

At clinical demonstrations, the student is encouraged to take part in the lively discussions which often follow and to pose questions on relevant points. He thus becomes an active participant rather than an observer and such active participation helps the student to absorb more anatomical facts than could possibly be the case by being a passive observer at routine lectures.

Clinical demonstrations teach the student how to integrate anatomical knowledge. Faced with a patient he has to recall what he has learned in the lecture hall and in the dissecting room and integrate the relation and relevance of such knowledge with the clinical material he is confronted with. Too many students seem to think of Anatomy as a collection of systems and organs corresponding to what is found in the textbook — thousands of facts all distinct from each other and all to be independently memorised. Nothing can be farther from the truth. The study of Anatomy can be rendered intelligent and easy only through the integration and coordination of anatomical facts to each other and to the whole.

Clinical demonstrations also often help the student understand aspects of Anatomy which would otherwise be difficult to appreciate. Nowhere is this more so than with Neuroanatomy. Greater emphasis is being laid nowadays on this branch of Anatomy, a sound knowledge of which is absolutely essential for the differential diagnosis of certain clinical disorders. It is impossible to learn the facts of neuroanatomy only by reading textbooks and impracticable to learn such facts by dissection which is a highly skilled and time-consuming task; furthermore, mastering the morphological aspects of neuroanatomy is only a basis for the more fundamental problem of correlating structure to normal and abnormal function. It seems therefore that the ideal method of teaching neuroanatomy is through the use of clinical demonstrations. Neuroanatomy in fact presents unrivalled opportunities for the integration of Anatomy with Physiology and the clinical subjects.

The Anatomy taught to the medical student must be that wich provides a basis for the understanding of the clinical subjects. The importance of this was recognised as far back as 1730 when Cheseldon in his 'Anatomy of the Human Body' wrote: "I endeavoured to be more explicit about those (things) which are of the greatest use in Philosophy, Physic and Surgery; and I would wish the dividing and distinguishing of parts were usually done with more regard to these valuable ends". Clinical demonstrations highlight for the student those features of Anatomy which are of clinical importance and out of a vast number of facts help the student select the material which forms the necessary anatomical scaffolding for the clinician and which he will be expected to recall throughout his life.

Clinical anatomy demonstrations prove also of benefit to the teaching staff. Having as they are to be jointly organised by both preclinical and clinical teachers, they promote not only cooperation and liaison but also personal contact and goodwill between these two groups of teachers, so helping to break down the artificial barrier which very often exists between them. Such a barrier is often not only on the personal, but also on the teaching level. It produces the so-called "integrated teacher", individuals who are ready to cross departmental barriers and bring their individual knowledge on a common subject under study. Such integrated efforts are most effective in advancing enquiries, whether practical or theoretical, both on the preclinical and clinical sides. They also serve constantly to remind teachers that the preclinical training in Anatomy must take heed of its purpose to provide instruction for the student's medical needs and not as a preliminary to advanced work in

the science of Anatomy — that the student must be a good doctor rather than a good anatomist. Teachers would then understand, more fully than they have perhaps done in the past, that the Anatomy they teach must contribute well-defined information to the student as an individual who later on is going to be a doctor caring for patients.

Invaluable as clinical demonstrations are to the teaching of Anatomy, one must be constantly aware of the possible pitfalls which could result from their use.

It has been suggested that clinical demonstrations might distract the student from his preclinical studies. The student might concentrate prematurely on clinical material so that he is weaned away from Anatomy and the other basic sciences. This possibility can be avoided partly by laying the right emphasis on what the student should attain in the preclinical period, namely a mastery of the fundamental skills and basic principles rather than the use of professional methods and materials, and partly by devoting to clinical demonstrations the right amount of time such as to stimulate without overburdening the student with clinical material.

It is possible that by integrating Anatomy with the use of clinical demonstrations, the preclinical student might fail to realise the relative importance of each and, having to contend with too much, might treat both too superficially. This leads to uneasiness on the part of the anatomist for fear that Anatomy might be too narrowly conceived and on the part of the clinician for fear that the medical student might get too superficial a view of the importance of a patient. The problem can similarly be solved by making the right emphasis on the right principles.

Clinical demonstrations have been criticised in that they take too much time, not only on the part of the teachers who have to organise them, but also of the students who have to attend them, with a consequent added burden on staff and students who are already both overworked. One must see that too much time is not devoted to this method of teaching.

It has been suggested that the preclinical period might be too early a stage to bring the student in contact with clinical material; the student is still clinically immature at this stage and therefore lacks the foundation for benefitting from seeing clinical patients. This may be true from the clinical aspect but is certainly not so from the anatomical sense.

Demonstrations, it has been said, might break up the continuity of instruction and interfere with the development of proper cohesion and unity in the teaching of Anatomy. Here again, however, a proper balance is essential in the time devoted to the use of clinical demonstrations and that devoted to other activities in the Anatomy curriculum.

Many clinicians who are excellent at demonstrating cases to clinical students, very often cannot adapt themselves successfully when they are trying to teach preclinical students; they talk at a level which the student is quite unable to reach. Apart from this, specialists often fall into the temptation of going into the aspect of their subject intensively and of emphasizing facts, which though academically interesting, have little or no value in preparing the ordinary preclinical student for his future work. Moreover, clinicians often emphasize the details of treatment which the student at this stage is unable to appreciate; especially so is the emphasis on operative techniques which might give the erroneous impression to the student that Anatomy is closely and solely linked with the techniques and interests of operative surgery. The student thus often finds himself at clinical demonstrations in a confused state of mind. It is only a matter of good judgement on the part of the teachers concerned which will help preserve the balance.

And as a last note of warning — the preclinical teacher must not lean too much on the use of clinical demonstrations to stimulate the student in his study of Anatomy and neglect to inject interest and stimulation in his own lectures and dissection classes. Clinical demonstrations supplement but do *not* replace the more orthodox methods of teaching Anatomy.

The organisation of clinical demonstrations should ideally be in the hands of a small committee on which are repre-

sented the clinical departments, including the specialised units, and the Departments of Anatomy and Physiology.

The time allotted to clinical demonstrations should be cut to a stimulating minimum so as to prevent the danger of distracting the student from his preclinical studies. The practice of some American medical schools of giving one demonstration a week is overgenerous and tends to encroach too much on the time allotted to the study of Anatomy. Ideally three to five demonstrations, of approximately ninety minutes each, should be given each academic term. This implies a total of 14 to 23 hours per academic year; taking the mean total number of hours allotted to the teaching of Anatomy as 573 hours per academic year, 3% of this would be devoted to clinical demonstrations.

It has been suggested that clinical demonstrations should be given as a 'crash' course in the later part of the preclinical period rather than being spread over the two preclinical years; the reason advanced is that the student, having by then covered most of the Anatomy, would be in a better situation to correlate his anatomical knowledge and apply it to the clinical material shown. I feel, however, that spread over a longer period clinical demonstrations would produce a more effective interweaving of the preclinical and clinical stages than would a more formal, shorter bridging course.

Clinical demonstrations tend to be time consuming for student and teacher alike if a judicious selection of cases is not made to preserve a proper balance. The cases selected should be those which give an opportunity to emphasize anatomical points of importance and to clarify the understanding of anatomical points which otherwise would be obscure. The cases chosen should have signs and symptoms easily interpretable in terms of the student's preclinical knowledge of Anatomy; they should if possible be chosen to correspond with the regions being dissected at that period and to illustrate clinically the conditions which correspond to what the student is studying at the time.

Conclusion

The use of clinical material should play an important part in the preclinical teaching of Anatomy to medical students. Greater use should be made in the future of clinical demonstrations to supplement the more orthodox methods used in the teaching of Anatomy.

There is no doubt that preclinical subjects should be given a clinical orientation. For this to be possible not only is greater cooperation and liaison called for between the preclinical and clinical departments, but preclinical teachers should be given part-time appointments in the teaching hospital, as was strongly recommended by the General Medical Council in a recent report to the Royal University of Malta, and as, after all, has long been the practice in medical schools in the United Kingdom. Only in this way could the preclinical subjects become linked with the clinical studies so providing better integration of the medical curriculum.