ECONOMY IN BARIUM MEAL EXAMINATIONS

BY

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The Duke of Wellington, when asked how he always succeeded in defeating his enemies, is said to have replied that, whereas their equipment was so cumbrous that it was only suitable for a prearranged plan, his own was simple and in consequence readily adaptable to changes in the military situation. The Duke's words provide us with a lesson which is specially applicable at a time when diagnosis is becoming more and more dependent on the use of apparatus. As radiology advances much ingenuity is being displayed in the production of single plants capable of performing all the ever-increasing types of operation that may be required. The result has not always been successful. The inevitable complexity has tended to obscure the distinction between essentials and non-essentials, between what is common and what is rare, to make complex and costly things which are really simple and should be much cheaper, and, worst of all, to make the operator the servant, not the master, of his machine.

This is especially true of methods now in vogue for gastro-intestinal examinations. The incidence of dyspepsia among our troops involves the necessity for radiological investigations on a large scale. At the same time the need for economy in material of all kinds makes it imperative that such investigations should be carried out as cheaply as is consistent with accuracy and efficiency. Reports made by many young radiologists often quite unnecessarily cover the whole intestinal tract from the oesophagus to the sigmoid, describing the course of the meal at intervals of a few hours, the shape and size of the stomach and the disposition of the colon. In examining the gastro-intestinal tract, and for that matter any system, the following two principles should be borne in mind. First, where there is a conflict between the anatomical and the physiological criterion, the physiological criterion is always the more reliable. The size and shape of the stomach, whether it is "hypertonic, orthotonic, or hypotonic," are of little significance except in so far as the condition can be shown to be associated with disturbance in the capacity of the stomach to fulfil its functions properly. This happens only in cases of extreme hypotonia. Secondly, the range of individual physiological as of anatomical variation differs so widely that clinical deductions should be made only with the greatest reserve and after taking all the circumstances into account. The rate of emptying of the stomach, for instance, not only is subject to wide individual variation but is also determined by the posture of the patient. Again, the so-called delayed emptying of the appendix is of doubtful significance in view of the wide range of the normal. Diffuse examination, apart from putting the patient to much discomfort, takes up a great deal of time and involves the use of a number of large films. But the greatest disadvantage is that it tends to distract attention from those abnormalities which are most likely to be found. In men of military age, and for that matter in the whole community, the commonest disorders for which information is sought are gastric ulcer, duodenal ulcer, and chronic appendicitis. One of these having been discovered, investigation of the rest of the tract is usually superfluous. In the majority of cases all three conditions can be adequately demonstrated on two or three half-plate films. I shall confine my remarks to examination for gastric or duodenal ulcer.

Gastric Ulcer

A fact which is not always realized by clinicians is that a single film apparently depicting a normal stomach is in itself no evidence of the absence of an ulcer, since the ulcer may be eclipsed by the lumen of the stomach in front of or behind it. Complete photographic proof of

the absence of an ulcer would need innumerable films taken in all directions. Having found an ulcer by screening, the radiologist should take films first with a small quantity of barium to demonstrate the disturbance in the arrangement of the rugae, and then with the stomach full of barium to demonstrate the true size of the ulcer. For the latter the patient should have been rotated into that position which brings the ulcer into maximum relief. Since most ulcers are situated slightly posterior to the lesser curvature this usually means that the patient is turned slightly to his left.

Duodenal Ulcer

The discovery and demonstration of a duodenal ulcer is probably the most difficult manoeuvre which the radiologist has to perform. Whereas the appearance of a gastric ulcer remains stationary and is not influenced by peristalsis, a duodenal ulcer is only visible intermittently during the short intervals when the cap is full. In determining the presence of an ulcer in this situation the operator must screen in all directions and, having found evidence of a deformity or of a crater, must satisfy himself that the deformity is not due to extraneous causes and that it accords with the site of tenderness to palpation. Then comes the most difficult part—to produce a film at the moment when the deformity is visible. For this purpose it is essential that radiography should be carried out almost instantly after screening. Most screening-stands on the market make no provision for this to be done, with the result that by the time a cassette is produced and placed in position the cap is empty. There is a device which enables the four quarters of a large film to be exposed in turn. The cycle of changes is thus caught in four phases, but, screening between the exposures being impossible, the exact moment when the deformity is most clearly demonstrated may still be missed.

The following method which I have devised meets the difficulty more efficiently. The ordinary large screen is removed from its frame, and its place is taken by the structure shown in the accompanying diagram. It con-

sists of a board of five-ply wood across which run two horizontal strips of wood grooved on their facing surfaces so as to allow a half-plate cassette to slide between them. To the middle third of the two strips a fluorescent screen of half-plate size is fixed in such a way that a space is left between the screen and the board into which the cassette can slide. The whole is backed by 2 mm. of lead,

except the part behind the screen. It is essential that the switchboard be of the dual control type allowing a rapid change-over from the screening to the exposure position. The radiologist controls the screening current by means of a foot-switch while a radiographer is in readiness to make the exposure. During screening the cassette is at the side of the screen and protected from the rays by the lead. At the appropriate moment the radiologist cuts off the screening current, calls "Ready," pushes the film behind the screen, and calls "Film" as a sign for the exposure to be made. During the short period between the signals "Ready" and "Film" the radiographer switches over from the screening to the exposure position. The advantages of this method are that the interval between screening and exposure is reduced to the minimum and that the radiologist can see the actual exposure on the screen and so knows whether it is correct or not. If necessary a compressor of loofah or other material can be attached; but I prefer to use the gloved hand, by means of which a finely graduated degree of pressure can be applied from below without obscuring the picture.

Apart from the screen the apparatus was made at a cost of a few shillings. Rarely are more than two or at the most three films necessary for the adequate demonstration of an ulcer. I suggest that if this simple device were adopted at all the Service hospitals the annual saving to the Exchequer would be considerable.

THE CONTROL OF LICE

BY

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Now that a considerable number of our people are sleeping crowded together in shelters it is likely that outbreaks of body and head lice will occur. Every medical man should know something of the insect's biology and the methods of control. The points which appear most important are here summarized. A full account of the whole subject, including its epidemiological side, has been recently published (Buxton, 1939).

Biology

In all lice the adult female lays eggs (nits), from which larvae hatch: these resemble adults except that they are smaller. The larvae grow and become adult males or females. On human beings we speak of "head lice" and "body lice"; the points of difference are very slight, and the life history and control are essentially the same. The "crab louse" or "pubic louse" is quite distinct from the others. All these three (head, body, and crab lice) are parasites of man and have no other host: every infestation comes from some other human being. The adults and larvae feed several times a day on blood alone. The whole life is generally passed close to the surface of the human body, the female sticking eggs to the hair of the head (head louse), or to the fibres of garments, particularly those next the skin, and to the hair of the trunk (body louse). Blankets are commonly infested with lice and eggs; furniture, walls, etc., so rarely that they are negligible.

At the temperature which prevails on the surface of the body (about 30° C., 86° F.) the egg stage lasts nine days, the larva lives nine days, and the adult about thirty days. The female lays eight to ten eggs a day—i.e., a total of about 250 eggs. A louse *might*, therefore, have 120 daughters and 14,400 granddaughters; even if the infant mortality is very high the rate of increase is surprisingly great after two or three generations.

Lice shun light, but probably move about rather freely at night. They spread readily when people are forced to

live and sleep in a crowd, particularly if the washing of clothes and person is difficult. In England, in peacetime, I am convinced that more than 10% (and often over 30%) of the children in elementary schools in towns and cities have head lice: in rural areas the figure is much lower. Girls are more often infested than boys of the same age; the infestation is higher in children of school age than in babies, adolescents, or adults. In peacetime the body louse is much rarer than the head louse, and is difficult to find except among the destitute. There is little doubt that it is more widely spread now than it was before the war, though no outbreaks have yet been recorded.

In any lousy community there is a tendency for most of the infested people to have no more than ten to twenty lice: a small proportion have a few hundred lice, and still fewer may have a few thousand. In other words, many infestations are so light that they may be missed, but a few of the people are centres of dissemination.

Repellents and Preventives

Essential oils and other volatile substances have a definite repellent effect, but not strong enough to prevent a louse sucking blood. We do not know any repellent which is of practical value. It is true that, given a choice, body lice will live and lay eggs on a rough material rather than a smooth (e.g., wool rather than silk), but this does not prevent them from colonizing silk underwear. It is definitely established that people with long hair are more liable to be infested with head lice than those with short: long hair is also more difficult to deal with if infested. Female social workers and others exposed to particular risk should sacrifice appearance and use the scissors freely.

Control: General Points

As head and body lice can multiply rapidly and spread through a crowded community, control is useless unless it is radical. If a group of men have body lice one must deal with their persons and clothes, and generally bedding. If it is possible the whole group—e.g., all the people who habitually sleep in one shelter—should be deloused in one day. Similarly with the head louse, one would wish to inspect and perhaps treat the infested child's neighbours in school, and his elder sister or infant brother.

More attention should be given to teaching people about the louse and ways of dealing with it, for some of the trouble is due to lack of frankness and to a tendency to conceal infestation. Make use of the poster published by the Central Council for Health Education, and the Health and Cleanliness Council's leaflet, "Cleanliness of School Children."

It is important to detect light infestations. If one is looking for head lice the eggs are generally easy to find: the living egg is plump and opalescent, and generally fixed to the hair close to the scalp; the dead egg or empty shell is flat and dirty, and may have been carried far from the scalp as the hair grew. Eggs are often fixed to hair in the region behind the ears; they may also be inside the hat. Most eggs of the body louse are fixed on seams or folds on the inner surface of undergarments; eggs and lice are generally congregated in limited areas. At the least one should examine shirt or vest, even if the subject is unwilling to strip completely. Some eggs and lice may also be found on the surface of the body, and on outer garments, even on their outer aspect.

Control on the Person

If the scalp is infested it is advisable, though not necessary, to shorten the hair. It is quite possible to disinfest a head by thorough combing, giving particular