poikiloderma, and Darier's disease. These cataracta syndromatologica may show very variable pictures; sometimes they appear as anterior subcapsular marginal opacities, sometimes as a typical shield-like cataract, or as a uniform yellow star-like opacity in the posterior cortex."

The exact classification of eczema is not definitely settled. Some include in the term "allergic eczema" all the diseases already mentioned—neurodermatitis, poikiloderma, scleroderma, Darier's disease, etc.; but others differentiate between a local lesion—e.g., prurigo Besnier, which commonly affects the flexures—and allergic eczema, typified as a generalized rash. If this difference be admitted it will be found that very few cases of cataract have been described associated with generalized eczema.

Summary

The lens is developed from surface ectoderm, and yet very rarely is involved in skin diseases.

Cases have been reported of cataract associated with skin disease, usually neurodermatitis.

Generalized allergic eczema is not the same as neurodermatitis, and a case is reported of cataract—beginning at the age of 26—in a man subject to allergic eczema.

Most cataracts reported have similar features and are situated beneath the anterior capsule.

It has been suggested that cataract formation in these cases is due to endocrine dysfunction (probably parathyroid). There does not seem to be enough evidence to support this. It is suggested that the cataract formation is influenced by the fact that both lens and skin have a common origin from surface ectoderm. The skin is sensitized to produce an eczematous rash and the lens capsule is affected in some way. This defect in the lens capsule disturbs its metabolism and allows opacities to form in the lens subjacent to the capsule.

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X-RAY TREATMENT OF INOPERABLE CARCINOMA OF THE RECTUM WITHOUT COLOSTOMY

BY

FF. ROBERTS, M.D., D.M.R.E.

Examiner in Radiology, University of Cambridge

(From Addenbrooke's Hospital, Cambridge)

The chief characteristics of rectal carcinoma are the early fixation to adjacent organs, the slow rate of growth, and the absence of distant metastases until a late stage in its course has been reached. Hence a very high proportion of its victims are found to be inoperable when first examined, but these have the prospect of relatively long survival, during which their sufferings are due to the local effects of the growth, frequent action of the bowels with a sensation of incomplete evacuation, and the passage of mucus, blood, and gas—symptoms which are more a matter of discomfort and inconvenience than of pain and do not greatly impair the general health. To meet this situation it has become the established practice to relieve the rectum of the necessity of performing its function, by carrying out left inguinal colostomy even though there is no obstruction. I quote from two standard textbooks of surgery published recently:

"Left inguinal colostomy, performed before obstructive symptoms develop, makes the patient's life more tolerable

and in many instances causes temporary recession in the activity of the growth. If colostomy is withheld there is a prospect of perhaps eight or nine months of life, but often a life of misery."

"Much relief may be afforded and life prolonged by colostomy, which should not be delayed until there are symptoms of obstruction."

These statements, representative of orthodox surgical teaching, require examination. Does colostomy prolong life? Does it necessarily diminish the patient's misery? Does it retard, even temporarily, the growth of the tumour, and must it be carried out before obstruction occurs?

Does Colostomy prolong Life and lessen Suffering?

The effect on the duration of life has been investigated by Lindahl (1936), who found that among patients who had no other form of treatment the average survival of those with colostomy was 24.5 months and of those without colostomy 19.7 months, these periods dating from the onset of symptoms. Taking into account the operative mortality of 16.8% in non-obstructive cases the value of colostomy in prolonging life appears from these figures to be very doubtful. Moreover, the difference in survival of 4.8 months is largely discounted by the reasonable supposition that cases with colostomy were on the average more advanced than those without and that in some of them colostomy may have been necessary on account of obstruction. Gabriel and Lloyd-Davies (1935), whose figures show an operative mortality of 13.4%, record the survival rates of 238 cases as follows: 50% under one year, 30% under two years, 10% under three years, and 6% over three years, only one patient surviving for more than five years. The average survival is thus about eighteen months.

Does colostomy lessen suffering? Gabriel and Lloyd-Davies state that it diminishes diarrhoea, tenesmus, pain, haemorrhage, and discharge, while improving the general condition. It is true that haemorrhage and mucous discharge may be reduced, but it is equally true that they continue and cause considerable discomfort, while occasionally severe haemorrhage occurs. There is a tendency to represent colostomy life as one of comparative happiness and comfort. No doubt some patients do get on remarkably well under these conditions; but they are comparatively few, and are to be found among the more intelligent members of society and those who can afford the regular attendance of a nurse. However, for the less intelligent and poorer people, especially those living in cramped surroundings, colostomy is anything but a blessing either for the patients themselves or for those who have to live with them. Moreover, the performance of manual work is at least a matter of great difficulty. The contention sometimes advanced that patients actually get to like colostomy is answered by the eagerness of those with a temporary colostomy to have it closed as soon as possible.

Effect of Colostomy on Growth of Tumour

It is said that colostomy retards the growth of the tumour by affording rest to the rectum and by removing the irritation caused by the passage of faeces over the ulcerated surface. The continued functioning of the rectum, it is alleged, increases its blood supply, which favours the growth of the tumour. While it must be accepted that the rate of growth of a tumour is limited by its blood supply, it appears to be well founded that a tumour, through its capacity to form blood vessels and to extract a blood supply from the host, can acquire all the nourishment for its insatiable needs at its growing points. But that the nutrition available for the tumour is appreciably increased by the periodic passage of faeces

over its surface seems to me to be extremely doubtful. Nor is there any evidence for the view that continued functioning of the rectum increases the liability to the escape of metastases to distant parts. By reducing sepsis colostomy is said to delay the formation of adhesions and involvement of the lymphatics. But since the rectum cannot be other than septic, whether functioning or not, it is at least doubtful whether the presence of faeces makes any material difference.

The advantage of resting an organ affected with malignancy is a matter that is often discussed: it is part of the larger question whether a patient with an inoperable growth is better off by living a restricted life of some length or a more active if somewhat shortened existence. In view of the very short prolongation of life afforded by colostomy and the risk of the operation as shown by Lindahl's figures, the loss of a doubtful few months' existence is probably more than compensated by the absence of colostomy. At any rate, this view would probably be taken by the more active members of the community.

When to Perform Colostomy

Finally, must colostomy be carried out when the patient is first seen? Only if it can be established that there is a reasonable fear of obstruction occurring later and that the operation would then be more difficult. This thesis would be very hard to maintain, for the great majority of patients who have no colostomy die of causes other than obstruction, such as secondary growths or septic absorption.

It appears, then, that except in cases of actual obstruction the value of colostomy is very doubtful and that our efforts should be directed to the restoration of rectal function to something approaching the normal. This can be achieved by irradiation by radium or x rays. While radium has many successes to its credit it suffers from the rapid diminution of intensity with distance—as much as 20% at 1 cm. depth. Colostomy is therefore usually though not always performed. Implantation from above as well as from below would seem to be essential in order to gain access to all parts of the growth without causing damage to neighbouring structures; for we have to deal, as Cuthbert Dukes has pointed out, not with a local growth but with a potentially malignant rectum. Gordon-Watson (1935), while recording the survival of two cases—one for 7½, the other for 4½ years after radium without colostomy—has shown the limitations of radium, the dangers of its use when secondary sepsis is present and when there is extension beyond the rectum, its tendency to increase pain, and the risk of a fibrous stricture.

X-ray Treatment without Colostomy

In the last five years I have treated inoperable cases by a modification of the technique previously existing. This method I have described elsewhere (Roberts, 1936). It is sufficient to say here that its main feature is the supplementing of the anterior and posterior fields, hitherto used, by two fields on the buttocks and three smaller fields—over, anterior to, and posterior to the anus. By this means the dose delivered to the tumour is greatly increased. Subsequent treatment is given approximately every six months, the amount and interval being determined not by the physical state of the rectum but by its functional behaviour. Thirty-five cases without and 11 with colostomy have been treated in this way. I have thus been able to observe the results of x-ray treatment, the value of colostomy, and the effect of colostomy on the response to treatment. In attempting, however, to form an accurate estimate I have been considerably handicapped by the difficulty of maintaining an adequate follow-up system under present conditions and by the interruption

caused through my absence for several months on military service. Of the 35 patients without colostomy 5 are untraced and several others were traced only to the time when they were no longer able to attend hospital, a difficulty unavoidable in a community which is largely rural. Ten of these patients were in an advanced stage of the disease when referred to me, and survived only a few months. I may say that in the hope that some relief might be given I have refused none, though experience has shown that advanced cases have derived little if any benefit. Of the remaining 20 patients who were followed up and who were in good general health, 6 are still living. Apart from the reasons given above, the average survival time cannot be estimated, since if the living are included this rises to infinity, while if they are excluded the picture presented is erroneously pessimistic. It is not, however, the length of survival but the well-being during survival that matters. All these cases have shown remarkable improvement—in the diminution of the daily motions from seven or eight to one, two, or three a day over a considerable period, in the suppression of blood and mucus, and, in most cases, in the patients' capacity to live almost a normal life. Moreover, since the dosage has not been carried beyond the stage of producing a well-marked erythema there have been no local ill effects. None has suffered from anal stricture and none, so far as I have been able to discover, has subsequently required colostomy. The following cases are worthy of mention.

Case Reports

Case 1.—A compositor aged 54 had three months' history of diarrhoea with slight blood and mucus, six to seven motions being passed daily. Examination revealed a large ulcerated mass in the posterior wall of the rectum. Since treatment blood and mucus have stopped and the bowels are open regularly twice a day. He is doing full work 4 years 6 months since his treatment and 4 years 9 months since the onset of symptoms.

Case 2.—A male old-age pensioner aged 67, working on the land, had one year's history of diarrhoea with blood and mucus, passing several motions a day. On examination there was a large fixed craggy mass surrounding the rectum with a small channel through it. Since treatment he has had three regular motions a day with occasional mucus. He is doing full work 3 years 10 months since treatment and 4 years 10 months since the onset of symptoms.

Case 3.—A carpenter aged 52 had one month's history of diarrhoea with eight motions a day. There was a mass at the recto-sigmoid junction, adherent posteriorly. Since treatment he has passed well-formed motions two or three times daily. He is doing full work 3 years 8 months since treatment and 3 years 9 months since the onset of symptoms.

Case 4.—A mechanic aged 54 had eighteen months' history of diarrhoea with blood and mucus, passing seven or eight motions a day. A large fixed mass was present. Now he has one or two well-formed motions daily and no blood or mucus. He does full work 3 years 9 months since treatment and 5 years 3 months since the onset of symptoms.

X-ray Treatment with Colostomy

In the 11 cases which had colostomy the operation had usually been performed as a matter of routine. One of these patients subsequently had profuse rectal haemorrhage which was stopped by x-ray treatment, one developed a prolapse of the colostomy, while nearly all suffered considerable discomfort from the continued discharge of mucus. Although the survival in some cases was long, I am convinced that their state was not improved by colostomy. Nor was their response to x-ray treatment improved, but rather the reverse. They may on the average have been slightly more advanced cases than those without colostomy, but I do not think that this difference is sufficient explanation of their failure to respond. The

depressing effect of colostomy has been an important contributory factor, but the chief reason, I think, is the absence of rectal function, which in those without colostomy serves as a valuable guide in the determination of the amount of treatment. Taking a broad view I am convinced that most of these patients would have been happier without colostomy and would probably have lived as long.

Summary of Conclusions

The value of colostomy in non-obstructive cases of inoperable carcinoma of the rectum is doubtful.

Except in advanced cases, x-ray treatment provides a method of restoring rectal function to a degree compatible with an active life for a considerable period without resort to colostomy. It has the further advantages of causing the minimum of discomfort and avoiding any operative procedure.

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THE VALUE OF VITAMIN B₁ IN DIPHTHERIA

BY

G. E. DONOVAN, M.Sc., M.B., D.P.H.

Medical Officer of Health for the Llwydwr Urban and Gower Rural Districts

AND

M. BANNISTER, M.B.

The Royal Infirmary, Worcester; late Resident Medical Officer, Hill House Isolation Hospital, Swansea

In estimating the value of vitamin B₁ in diphtheria it can be argued that the general population does not receive an adequate amount of that vitamin and that the neglected case of diphtheria comes from a poor or careless home. It is possible that an acute illness may reveal a latent deficiency, and this may be accentuated by the nutriment given in diphtheria, especially glucose. The argument is strengthened by the obvious resemblance between the clinical condition produced by the toxin of diphtheria and that by vitamin B₁ deficiency, as both show anorexia, circulatory failure, and polyneuritis.

We have summarized in Table I most of the published cases of diphtheria in which vitamin B₁ has been used.

The Present Series of Cases

As the published results of the various authors are contradictory it was decided to reinvestigate the problem and check our results by controls. The cases chosen suffered from severe or very severe faucial diphtheria. They were given the usual treatment, such as anti-diphtheritic serum, absolute rest, etc.; but the test cases had vitamin B₁ in addition. The dosage was 4.5 mg. subcutem daily, the total varying from 36 mg. up to 162 mg. Both test cases and controls were given the routine hospital diets. It was considered desirable not to modify the vitamin content of these diets, which consisted of:

The Onset Diet.—Milk 3vj with glucose 5j at each meal. Water and occasional orange juice between.

The Continuation Diet.—Milk with weak tea, jelly, rice pudding made with milk, crustless bread and butter, small quantity of fresh fruit.

The Recovery Diet.—Breakfast: Egg sandwiches, tea. Lunch: Cocoa made with milk, plain biscuits. Dinner:

TABLE I.—*Published Cases of Diphtheria in which Vitamin B₁ has been Used*

Observer	No. of Cases	Type of Case	Result
Neumann (1935)	2	Post-diphtheritic paralysis	Rapid improvement—more marked than ever before observed
Peters and Cunningham (1937)	10	Severe cases of diphtheria	No effect on incidence of paralysis—2 developed paralysis of ciliary and palatal muscles; 2 others showed additional paralysis of pharynx and diaphragm, both dying. Clinical experience confirmed by experiments on guinea-pigs
Knapp (1937)	2	(a) Drunkard with severe diphtheritic paralysis of diaphragm (b) Paralysis of soft palate and diphtheritic pseudo-tubes in child 3 years old	(a) "A rapid improvement at the very last moment" (b) It was possible to relieve all symptoms within three days
Bennholdt-Thomsen (1936)	1	Severe pharyngeal diphtheria in child 4 years old, in addition to extensive paralysis of diaphragm and bronchopneumonia	Improvement after first dose; improvement continued afterwards, so that the diaphragmatic paralysis disappeared within a few days
Tecilazic (1938)	5	Paralysis of diaphragm	2 recovered; the other 3 died
	31	Examples of paralysis of palate	No effect
	24	Malignant diphtheria	Incidence and severity of paralysis much less than usual
	33	Extensive faucial involvement	
Strnad (1938)	5	Toxic diphtheria with severe myocarditis and polyneuritis	Improvement was rapid and dramatic in all cases
Reich (1938)	1	Severe post-diphtheritic pseudo-tubes with cranial nerve paralysis	Immediate improvement in mental and physical activity, which wore off in a few hours. Paralysis progressed, but diminished after 7th injection
Schiaparelli (1938)	?	Animal experiments	Vitamin B ₁ was found to have no prophylactic or therapeutic effect on post-diphtheritic paralysis. At the most it could be observed that paralysis set in later in guinea-pigs treated either previously or simultaneously with vitamin B ₁ than in control animals
Hansen (1939)	?	?	Hansen expresses opinion that vitamin B ₁ has no favourable effect in diphtheria
Feige (1939)	30 cases and 30 controls	Mixed	Average duration of paralysis in children so treated was 29.6 days, whereas in the controls it was 49 days. Two patients on vitamin B ₁ and 5 not on it died
Reinhard and Schwartz (1939)	17	Routine diphtheria	No appreciable improvement in the paralysis followed treatment with aneurin. Their results were supplemented by estimating aneurin content of urine, which fell in those developing post-diphtheritic paralysis
Kiss (1940)	3	Post-diphtheritic paralysis	Clinical recovery began in a few days and proceeded rapidly
Frey (1940)	18	Severe faucial diphtheria with more or less widespread paralysis	Seven died. Frey believed in the specific action of vitamin B ₁ on nerve supply to the diaphragm. Some of those fatal cases showed evidence of improvement in diaphragmatic movements before death

Potatoes, gravy, mincemeat, sometimes a second vegetable; rice pudding with milk. Tea: Bread, butter, jam, fresh fruit, weak tea. Supper: Hot-pot and rice, cornflakes or porridge, milk.

The home conditions of the patients were investigated, as it was hoped they would act as an index of the previous intake of vitamin B₁. The cases are summarized in Tables II and III.