Ulcerative Colitis *

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Ulcerative colitis remains an unsolved problem. The pathogenesis is not known, the prognosis uncertain and the best method of treatment has not been settled. Since the original report of Helmholz in 1923 there have been a number of accounts of this disorder in childhood, and recently, with two colleagues, Dr. Platt and Dr. Benson, I have followed the clinical progress of 60 cases from the onset. Many of them have now grown up and the period elapsing since the beginning of their illness is more than five years in practically 60 per cent.

Ulcerative colitis is undoubtedly a most unfortunate complaint, fraught with several dangerous complications and the prospect of many years' ill health and enforced interruption of school life. It was therefore heartening to find in our recent investigation that the illness in childhood did not carry such an evil prognosis as was thought. An appreciable number of our patients have made such encouraging progress and remained symptom free so long, that they might almost be counted as cured. Since relapses have been known to occur after an interval of five years or more one can never be quite certain.

Sex.

We found the sex distribution to be equal, although other accounts give a higher incidence in boys than in girls.

Age of Onset.

No age is immune. In six of our cases symptoms began below the age of one year, thereafter the onset was most frequent between six and nine years, which is what other investigators have found. Our earliest case was in a baby of two weeks. She is now a girl of thirteen years, still not cured, but with symptoms sufficiently under control to

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enable her to attend school. At the Mayo Clinic in America, which caters for people of all ages, one out of every nine cases had started their trouble before they had reached fifteen years. All this indicates that ulcerative colitis is not an uncommon disease in childhood.

Mode of Onset.

This can be insidious, with increasing diarrhoea and mucus in the stool. After a month or so, blood is passed, but occasionally this may be delayed for one or two years, and exceptionally it never appears at all. Tenesmus and colicky pain just before defaecation are sometimes present, and incontinence may occur as the diarrhoea increases. It is perhaps not generally realised that rectal bleeding may be the first sign of this disorder and precede diarrhoea for an appreciable time, even for as long as three years.

Less commonly the first signs and symptoms draw little attention to the alimentary tract. The child is irritable, depressed, has no appetite and may vomit. There is loss of weight and anaemia. This mode of onset is found more often in the younger children. Abdominal pain may be the only symptom for the first few months (Table 1).

TABLE : 1

INITIAL SYMPTOMS

Rectal Bleeding, with or without mucus and diarrhoea	29	49%
Diarrhoea, with blood initially	18	30%
Abdominal Pain	5	8%
Non-specific Symptoms	8	13%
	60	100%

Table showing mode of onset.

A fulminating form of the disease is also recognised. Here the child is very ill and toxic with high fever. The diarrhoea is so severe and the blood loss mounts up so quickly that intravenous fluid and blood transfusion are required for the dehydration and anaemia. Contrary to the experience of others, we have only met this type of onset in one case. This was in an infant of four months, who died of a perforation seven months later whilst on steroid therapy.

Cause. Psychological Factors. Family Background.

The cause of the disease is not known, though many theories have been suggested. Many believe that it is a psycho-somatic disorder,

pointing out that worry and mental upsets are often responsible for relapses. Most children would take these jolts in their stride, but the individual with ulcerative colitis is highly sensitive. Thus a new school, an examination, a domestic argument or apparent switch in affection, an unpleasant experience or punishment for some misdemeanour are exaggerated in the child's mind into a minor crisis. Personality studies bring to light many types, but one stands out as most characteristic. These children are over-conscientious, too scrupulous, shy, timid, ambitious, working hard at school and worried about their achievements. They are usually tidy, clean and have a horror of dirt. Most of them are over attached to one parent, or are battling against a mother's possesiveness. They are incapable of expressing righteous anger, particularly against persons close to them who matter most, and bottle it up instead. It has been said that when their behaviour is good, the diarrhoea can be severe, and conversely, when the diarrhoea is under control, they are naughty, in other words their internal troubles have either a psychic or somatic outlet.

Treatment along psychiatric lines has its limitations. At the best, it can only be counted on to help the patient adjust his mental reactions to the disease. While some doctors feel that it brings no benefit at all, others claim to have produced remission with what they term 'superficial' psychotherapy.

We have been able to find psychological factors in a third of our cases. Divorce or separation, parental disagreement, tension between mother and child, illness and death in the family, or domestic insecurity formed part of the general picture. One boy became a juvenile delinquent. He was an 'angry young man', who his mother prophesied would end in prison, and she was right. On the other hand, the other two thirds were stable and enjoyed a harmonious home.

Jewish children are notoriously highly strung and it was interesting to find that they formed an unduly high proportion of our cases.

Heredity.

No genetic pattern has ever been discovered in ulcerative colitis and yet in our series ten near relatives, 17%, were found to have suffered from the same disease.

Complications.

These are relatively common in childhood and may be the direct result of the lesion in the gut, or arise elsewhere in the body.

Perforation is obviously the most immediate danger. If there is general peritonitis, surgery should be carried out at once, but the

leak of bowel contents may be quite localised and then antibiotic treatment will suffice. Some form of perforation occurred in four of our cases, one whilst on cortisone, which we will see later appears to increase the risk of this complication. *Fistula* can also follow erosion of the intestinal wall. It may take place between one coil of gut and another, through the abdominal wall or in the perianal or recto-vaginal region. We came across this in eight cases, in some of which it must have been a silent process as it was only discovered at operation. Intestinal *stricture*, not necessarily associated with cancer, is another obvious result. It is less frequent than the other complications; it occurred in three of our cases. *Massive haemorrhage* is fortunatly rare, but is an emergency requiring immediate blood transfusion. Generally the loss of blood is more constant and gradual and may produce marked anaemia.

When the disease is severe and prolonged, increasing areas of mucous membrane are destroyed and what is left remains inflamed, hypertrophied and has a polypoid appearance. The great danger then is the subsequent development of *cancer*, an increasing risk the longer the disease continues. With a history of ulcerative colitis dating from childhood, there is a greater chance of this serious complication; the incidence is in fact in the region of 6%. It has been reported as early as $15\frac{1}{2}$ years, but in our series the two patients who were affected had reached the age of 25 years. No doubt further instances will be discovered the longer we are able to trace our cases. Certainly this risk is one of the major considerations when medical measures have failed and major surgery is being contemplated.

The main complication outside the alimentary tract is *polyarthritis* and we noted it in 20 per cent. It can be quite severe, the knee joints being a favourite site for painful effusions to develop, as occasionally occurs in bacillary dysentery. Pericarditis was associated with arthritis in one child, but this was not rheumatic in type and pancarditis has never been reported. On the other hand, it does suggest that ulcerative colitis might well fall into the group of collagen disorders. *Erythema nodosum*, not necessarily with a positive Mantoux reaction, has also attracted attention, but we have never encountered this complication. On the other hand we have seen *pyodermia* with quite extensive ulceration of the skin. The liver may become involved, with subsequent *cirrhosis*, and we have one example of this. Sheila Sherlock quotes an incidence of 5% and suggests that it may either be the result of protein deprivation following the prolonged diarrhoea or due to homologous serum jaundice as a result of incompatible blood

transfusions. The only undesirable effect we have seen from this treatment in the past was the production of rhesus antibodies, which in the light of modern knowledge of blood groups should no longer result. *Retardation in growth* and physical development can be a feature in children who have suffered from prolonged malnutrition in this disease.

Other rare sequelae are pyelitis, amyloid disease, purpura, clubbing, recurrent oedema and hypokalaemia. Complications we encountered are set out in Table 2.

TABLE: 2

COMPLICATIONS

Carcinoma	2
Fistulae and anal fissures	8
Perforations	4
Intestinal stricture	3
Ileostomy complications	1
Rectal polypus	1
Hip flexural deformity	2
Arthrithis (20%)	12
Pericarditis	1
Clubbing	6
Enlarged liver (1 cirrhosis)	4
Rhesus sensitisation	2
? Amyloid disease	1

Table showing complications in 60 cases. Hip flexural deformity was probably the result of retrocolic inflammation and psoas muscle spasm.

Diagnosis.

Once the disease is well established, the clinical picture leaves little doubt as to the diagnosis. With a sudden attack, dysentery may be suspected and can be excluded by bacterial examination of the stools. Intussusception, whether acute or sub-acute, has quite a different clinical picture. When blood is passed without diarrhoea, a rectal polypus might be a likely cause. *Sigmoidoscopy* should reveal this, whereas in early ulcerative colitis the mucous membrane will have a velvety appearance and will bleed easily when touched. Mucus and possibly blood and some pus may be present in the lumen. At a later stage in severe cases ulceration will be seen, and when this becomes extensive the intervening mucous membrane may even have the appearence of polyposis (pseudo-polyposis). In our series proctoscopy revealed granular appearence of the bowel wall in 35 and ulceration in 15.

In five the appearance was normal, but other clinical considerations left no doubt as to the diagnosis. It must be presumed that at this stage the lowest part of the bowel was not involved, and in fact characteristic changes appeared later when endoscopic examination was repeated in two patients, one of whom died from the disease.

The outline of the colon shows typical radiological changes after a *barium enema*. Haustration is absent; the gut walls are less distensible, straight, and a fine saw-tooth like pattern is seen at their edges, where actual ulcers may be defined. In advanced cases the bowel will be shortened, further narrowed and produce a "lead-pipe" appearance. When the mucous membrane is extensively denuded the barium will settle in small broken up quantities, resembling a cobblestone pavement. Multiple small filling defects occur when pseudo-polyposis is present. At an early stage the x-ray changes may be confined to a segment of the large bowel, but later abnormalities may extend along the whole colon and into the lower end of the ileum.

Barium enemas were undertaken in 46 of our patients. Twelve were normal, 18 showed distal changes only and in 16 the whole colon was involved. As one would expect, nearly all the last group (13 out of the 16) had a severe clinical picture. Surgery had to be carried out in eight and is pending in two, cancer developed in another and a further case proved fatal.

Prognosis.

The outlook in this disease has certainly become brighter during the last years. Many factors have contributed to this: antibiotics in controlling secondary infection, timely blood transfusions and supportive treatment, based on a clearer conception of electrolyte disturbance. But the greatest advance has come from steroid therapy and improved surgical technique, and it is these that have reduced the death rate and improved the prognosis.

As in certain other diseases, 'cure' is mentioned with some trepidation and we prefer to call it a 'remission'. With this well in mind, it is true to say that after two years' freedom from symptoms a recurrence is unusual. On the other hand a long history of the disease does not preclude ultimate improvement, but after an illness of about seven years this becomes very unlikely. Our overall picture of the prognosis is as follows (Table 3.)

TABLE: 3
PROGNOSIS IN 60 CASES

Dead	5
Symptoms	21
Well	30
Well on Steroids	4
	60

It is interesting to relate the prognosis to the previous course of the disease and we have adopted a classification that has received fairly wide support:-

1. *Acute fulminating*, with death generally within one year.

2. *Chronic intermittent*, with freedom from symptoms for several weeks at least between attacks.

3. *Chronic continuous*, with symptoms for more than one year.

4. *Single attack*, followed by complete freedom from symptoms.

As could be expected, the outlook is definitely better in group 2 than group 3 (Table 4).

TABLE: 4
PROGNOSIS RELATED TO CLINICAL COURSE

1. *Acute fulminating, death within one year*				1
2. *Chronic intermittent*	(a)	Dead	3	
	(b)	Symptoms	9	
	(c)	Well	18	30
3. *Chronic continuous*	(a)	Dead	1	
	(b)	Symptoms	12	
	(c)	Well	8	21
4. *Single attack with complete remission*				4
Well on Steroids				4

We have been able to follow the course for over ten years in 25 and the result has been quite encouraging (Table 5). If we look into what happened to the children who have now passed the age of 20 years (Table 6), we find that at least half are in good health but still not free from the risk of cancer.

TABLE: 5

PROGNOSIS 10 YEARS FROM ONSET

Dead	3
Not known	4
Symptoms (1 surgery)	4
Well (5 surgery)	14
	25

Those with symptoms are able to lead more or less a normal life.

TABLE: 6

PROGNOSIS BY THE AGE OF 20 YEARS
(none over the age of 30 years)

Died of Cancer	2
Untraced	3
Well	8
Colectomy with anastomosis	3
Anastomosis without colectomy	1
Recent symptoms	1
	18

The three patients with colectomy and anastomosis are on the whole well, one has mild symptoms and another is troubled at intervals by a leaking faecal fistula at the old ileostomy scar. The patient in whom an anastomosis was carried out without colectomy is in good health.

There is one other age group to be considered. It would not be surprising if onset of the disease in early infancy were found to have a particularly evil prognosis. From our observations this does not follow, and we can take some comfort from the course the illness took in 6 children, although the outcome is as yet by no means assured (Table 7).

Surgery.

Hope of possible recovery and a natural aversion to condemning a child to an ileostomy, which may well be permanent, make a decision in favour of drastic surgery so difficult. Every other method of therapy must obviously be tried first and yet surgery should not be delayed too long and only undertaken as a last resort, when the patient is in a debilitated and toxic state. Emergencies such as bowel perforation, obstruction and suspected malignant disease are obvious

reasons for immediate operation, but in the majority of cases there are no such clear indications. If ileostomy alone is ever likely to succeed, it is in the earlier stages of the disease, but there are definite disadvantages to this limited procedure. Most surgeons today advise total colectomy as well, with or without ileorectal anastomosis. With constant symptoms for over three years, the lesions in the colon are almost bound to be irreversible, and if medicine has failed to arrest the progress of the disease by the end of seven or eight years, it should be abandoned in favour of surgery. Some doctors would undertake this earlier, bearing in mind the danger of cancer and the gradual deterioration of the patient.

TABLE: 7

INFANTILE CASES

Name	Onset	Presentation	Therapy	Outcome	Age
M.W.	Under 4 months	Diarrhoea	Steroids	Died. Perforation	11 months
C.W.	2 weeks	Diarrhoea	Steroids	Symptoms	13 years
L.J.	1 month	Feeding difficulties	Steroids	Well	8 months
B. R.	3 months	Blood in stools	Ileostomy 1 $\frac{1}{2}$ years Colectomy 2 $\frac{1}{2}$ years	Fairly well and awaiting anastomosis	6 years
G. G.	3 months	Diarrhoea and mucus	Non-specific	Well	3 years
D. W.	9 months	Diarrhoea, mucus and blood	Non-specific	Well (some diarrhoea)	9 years

Illustrating prognosis in children in whom onset had occurred in the first year of life.

Abdominal surgery has made such great strides that postoperative complications are no longer so likely to follow. Twenty years ago the operative mortality was as high as 50%; now in one reported series it has fallen as low as 5%. But it is still dangerous to operate during an acute fulminating stage of the complaint, and here steroid therapy is so valuable in first bringing the disease under some sort of control.

The horror of leaving an adolescent child or young adult with a permanent ileostomy still weighs heavily in the final decision of parents

and doctor. Ileorectal anastomosis after colectomy would overcome this very serious objection, but opinions are still divided as to the advisability or ultimate success of this step. In some cases the rectum anyway is too far involved for this to be carried out; in others it may become so later after the operation, which means restoring an ileostomy when an anastomosis has failed. Up to date the cases we have been following have been fortunate in their surgery. Anastomosis has been accomplished in eight and they are all well, or improving and leading normal lives (Table 8).

TABLE: 8

SURGERY

Name	Operation	Age (years)	Result	Present Age (years)
J. P.	Obligatory Ileostomy(1)	14	Well	19
B. R.	Ileostomy and Colectomy(2)	1 $\frac{1}{2}$	No symptoms. Underweight.	6
P. S.	Ileostomy and Colectomy(2)	10	Too recent	10 $\frac{1}{4}$
M. K.	Anastomosis — without colectomy	11	Well	26
D. H.	with colectomy, two stage or more	15;16 $\frac{1}{2}$	Well	20
S. W.	„ „ „ „	11;13	Well (faecal fistula)	21 (married, one child)
P. R.	„ „ „ „	9;10	Well	14
C. P.	with colectomy, one (3) stage	12	Improving	13
J. C.	„ „ „ „	14	Improved	17
S. H.	„ „ „ „ (4)	10	Improving	11
M. P.	„ „ „ „	13	Well	26
C. A.	Appendicostomy	12	Died. Carcinoma	23

Results of surgery. Note (1) Colectomy at 16 years, removal of rectum at 17 years; (2) Anastomosis still contemplated; (3) Immediate post operative obstruction, relieved by surgery; (4) two years previous steroid therapy failed.

Steroid Therapy.

It is now widely accepted that steroids are a great help in the treatment of ulcerative colitis, provided their shortcomings and possible risks are fully realised. As in so many other diseases, symptoms abate dramatically, but the basic pathology may be only temporarily suppressed and can burst into activity again soon after the treatment

is stopped. There is no doubt that remissions are produced more rapidly and completely by steroids than by any other means, and they are especially valuable in acute fulminating cases where 50 to 60 per cent are said to respond. After about two months'therapy recovery may last for one or two years, but relapses have occurred from two to nine months after cessation of treatment, and then repeated or more prolonged courses will still prove successful.

Ulcerative colitis seems to react to steroids along similar lines as do many other diseases, but in childhood there is always the hope that the disorder may ultimately become permanently arrested and will no longer require extraneous hormone support. This could be expressed with greater conviction if the state of the colon ran parallel with clinical improvement. Some decrease in the severity of the lesions has been found on repeated sigmoidoscopy. Our small experience does not bear this out, and in two children who had received great benefit on a prolonged course of cortisone, persistent local lesions were found. The effective dose of steroids varies considerably from patient to patient and also at different periods of the disease in the same patient. Undoubtedly quite high dosage may be required, particularly in severe and long-standing cases. When this is producing undesirable side effects, it is a good plan to administer hydrocortisone hemisuccinate rectally overnight, under sedation if necessary, permitting a considerably lower yet effective dose. So successful is this proving that the method may well supersede the systemic route.

The result of steroid therapy in the group we have investigated demonstrates well its limitations (Table 9)

TABLE: 9

STEROID THERAPY

No improvement		3
Remissions		6
Died during treatment		2
Still on steroids		
Symptoms	5	
Well	5	10
		21

Results of steroid therapy. Analysis of the remissions, all of whom are now off steroid treatment: 2 remain well, 2 relapsed, 1 well after temporary relapses when dose was reduced, 1 untraced. The three who showed no improvement were treated when steroids first became available, and the dose may well have been insufficient.

Anyone using this treatment should be fully aware of the risks attached. Dilatation of the colon may result, and at operation it has been found to be more friable. Perforation of the bowel has been reported, and this took place in one of our series, with fatal results. In two others, it had probably occurred, but the patients recovered without laparotomy. Certainly it is a danger always to have in mind, and if there is no response to steroid therapy after two weeks it should be abandoned. When cortisone or pregnisolone has been given successfully for any length of time, it should be replaced by corticotrophin for a suitable period before tailing off the treatment, or if surgery is to be undertaken.

Non-specific supportive therapy consists chiefly in giving a nourishing diet, antibiotics whenever there is any secondary bowel infection and blood transfusion will obviously be beneficial when anaemia is present.

Conclusions.

To summarise our conclusions, this study shows that ulcerative colitis presents special problems in childhood. There is evidence that the prognosis is favourable in a fair proportion, even with medical treatment alone. When this fails after a fair trial, surgery should be undertaken, and if this is not delayed too long there may be a better chance of successful ileorectal anastomosis. While steroid therapy is of considerable value, it often merely masks the symptoms and fails to arrest the pathogenic process and bring about a permanent cure. As long as a damaged colon remains there is always the spectre of subsequent cancer in the background.