The commonest site for leiomyomas is the lower oesophagus, so that again they can be expected to occur from time to time in association with the commonest lower oesophageal lesion—namely, a hiatal hernia.

These tumours vary in size from a match-head to one weighing 1,420 g. as reported by Kenney (1953). They are firm and may be round, nodular, or lobulated. Though they can be localized, they tend to encircle the oesophagus and spread upwards in the submucosal plane. Only if there is actual narrowing of the oesophageal lumen will dysphagia occur. Because the oesophageal lumen was not grossly occluded, the two patients in this report had symptoms referable only to their hiatal hernias. Neither barium studies nor oesophagoscopy suggested the presence of an intramural tumour.

The Approach to Hiatal Herniorrhaphy

Several surgical approaches to hiatal herniorrhaphy have been devised. Harrington (1955) has favoured the abdominal approach, Allison (1951) the left thoracic approach, while Collis *et al.* (1954) have advocated an abdomino-thoracic approach. I have on one occasion successfully repaired such a lesion through the right pleural cavity (Borrie, 1958).

Suffice it to say that as a guiding principle the route chosen for this operation should be the one which allows of greatest flexibility—and especially when unsuspected tumours can be discovered by chance in the lower third of the oesophagus or upper third of the stomach. This pathological fact strongly supports the view that the route that will allow inspection of both the lower oesophagus and the upper stomach should be used wherever possible, and that opportunity be taken to inspect the foregut on both sides of the diaphragm. This ideal is possible only via a left transthoracic approach with division of the diaphragm. Had these two patients been treated by the abdominal route, these tumours could not have been detected during the standard transabdominal repair and therefore would have been left to grow until the inevitable onset of dysphagia.

At operation the lobulated appearance of the lesion confined to the oesophagus with no extension into surrounding structures and no lymph-node invasion made the diagnosis of an intramural leiomyoma tolerably certain. Conservative removal was therefore chosen, and a vertical incision through the outer muscle layers gave easy access to the loose submucosal plane in which it lay. Careful dissection was required to avoid injury to the mucous layer. Thereafter the hiatal hernia was reduced and repaired by standard techniques.

Summary

The chance finding within a seven-months period of two leiomyomas of the lower third of the oesophagus during transthoracic repair of two apparently simple sliding hiatal hernias emphasizes again that hiatal hernias do sometimes occur in association with lower oesophageal tumours—benign as well as malignant—that some of these tumours may be undetectable despite barium studies and oesophagoscopy until operation, and that only by the left transthoracic route can they readily be detected and treated.

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EFFECT OF PREDNISOLONE IN BANCROFTIAN ELEPHANTIASIS

BY

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Conflicting reports on the place of steroids in the treatment of Bancroftian elephantiasis have suggested that further trials were necessary before their efficacy in the treatment of this condition could be ascertained. Using corticotrophin, McFadzean (1953) was unable to detect any improvement in his cases in West Africa, and Subramaniam and Mohammed (1957), in India, reported only temporary improvement with cortisone. Markell and Kerrest (1955), in Tahiti, reported considerable improvement with cortisone, and Laigret, March, and Kessel (1957) obtained good results when cortisone or prednisone was combined with bandaging and Unna's paste.

The present communication is a report of a trial in which prednisolone was given to seven persons with Bancroftian elephantiasis due to periodic *Wuchereria bancrofti*.

Material and Methods

The diagnosis of Bancroftian elephantiasis is sometimes difficult, as laboratory tests are rarely of help and clinically the condition is often indistinguishable from other causes of tropical elephantiasis (Jordan, Trant, and Laurie, 1956). Patients were selected for the present series if they came from areas of Tanganyika where Bancroftian infection was known to be common. The condition had been present for periods ranging from one to eight years, and the severity of the disease varied from slight to severe. In some advanced cases the skin was verrucose, and in every case was thicker than normal. In three patients the disease was bilateral.

All patients were examined and questioned with regard to possible peptic ulceration and chest disease. Where necessary an *x*-ray examination was made. The fluid intake and urinary output were measured for a few days before treatment in order that any diuresis that might occur during treatment could be more accurately assessed.

The legs of all patients were measured at four levels —mid-thigh, mid-calf, at the ankle, and round the foot— before and after treatment. Measurements were made at preselected points at fixed distances from the anterior superior iliac spine. Accuracy in measuring the circum-

ference of limbs on a number of occasions, even at selected points, leaves much to be desired. In some cases an apparent reduction in the size of the limb was noted at one level, while no reduction, or even an increase, was noted at another site. In order to obtain an overall picture the four measurements were added. This single figure was then compared with subsequent measurements.

Treatment

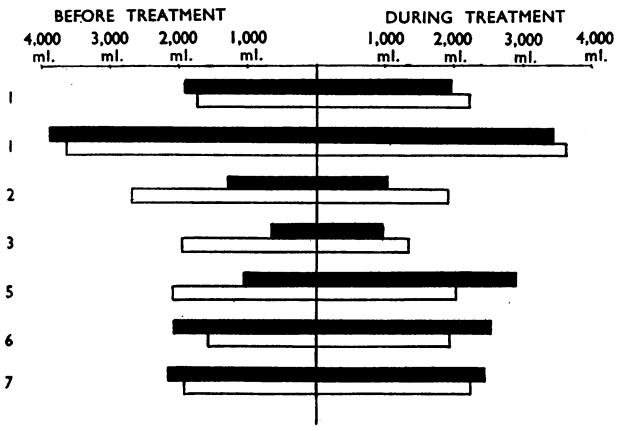
The first three patients were confined to bed during treatment, but the fourth, an African medical student, was treated as an out-patient, and his early elephantiasis improved considerably. In view of this success, and the fact that the cases in the successful series had all been out-patients, subsequent patients were encouraged to walk about during treatment.

Treatment was started with twice-daily injections of 1 ml. (25 mg.) of prednisolone, followed by 1 ml. a day in two doses for 25 days. The drug was then slowly withdrawn.

Side-effects were noted on two occasions. Patient 1 (who was confined to bed) developed palpitations and pain in his chest. A pericardial rub developed, but this cleared in a few days without the drug being discontinued. A second course of treatment with the patient ambulant was completed uneventfully. Patient 6 complained of palpitations, but no physical signs developed. The drug was continued, and the patient, who had been ambulant, was made to rest more. The condition cleared before the end of treatment.

Results

In only one patient (Case 1) was a slight diuresis noted, and it is interesting that this also occurred during a second course of treatment (see Chart). The result



Fluid intake (black) and urinary output (white) before and during treatment. (Patient No. 4 was treated as an out-patient and no figures are available.)

of limb measurements, before and after treatment and at follow-up, are shown in Table I. Though there was a slight improvement in limb measurements in most patients at the end of treatment, the medical student referred to above was the only one in whom a lasting reduction in the size of limb was obtained—the measurements of the two limbs being almost identical at the end of treatment, and the thickened skin was normal. Eight months after treatment the condition had not deteriorated.

TABLE I.—*Results of Treating Elephantiasis with Prednisolone (Measurements in Inches)*

Case No.	Leg	Sum of Measurements from 4 Levels: Pre-treatment	End of Treatment	Follow-up	Time of Follow-up	Comment
1	L.	64·6	60·5	66·1	6 months	Bilateral disease. 1st course. Treated in bed
1st course	R.	65·1	62·3	68·2		
2nd course	L.	66·1	64·7	67·5	2 ,,	Ambulant
	R.	68·2	67·5	70·5		
2	L.	54·4	54·5	53·4	3 ,,	Rt. leg diseased. Treated in bed
	R.	65·6	61·1	67·2		
3	L.	62·8	61·7	62·7	12 ,,	Lt. leg diseased. Treated in bed
	R.	60·8	61·4	61·2		
4	L.	57·3	54·3	53·5	8 ,,	Lt. leg diseased. Ambulant during treatment
	R.	55·8	54·3	55·5		
5	L.	60·9	61·0	62·0	4 ,,	Bilateral disease. Ambulant
	R.	56·6	56·9	56·8		
6	L.	52·7	50·0	52·3	6 ,,	Bilateral disease. Ambulant
	R.	52·2	51·5	51·9		
7	L.	50·5	49·3	No follow-up		Rt. leg diseased. Treated in bed
	R.	55·2	53·7			

At the end of treatment a slight reduction in the size of the limbs—elephantoid and normal—was noted in all but one of the other patients. The reduction was greatest in those who were confined to bed during treatment. The prednisolone cannot be claimed to have caused this reduction, as a reduction invariably occurs if a patient with elephantiasis is confined to bed, whether or not treatment is given. On becoming ambulant, however, the limbs returned to their previous state, and at follow-up examinations, 2 to 12 months later, limb measurements were no less than before treatment.

Effect of Prednisolone on Clinical Condition

Markell and Kerrest (1955) suggest that the total of 540 mg. of corticotrophin given over a period of eight days by McFadzean was insufficient to bring about a reduction in the size of the elephantoid leg. They gave 100 mg. of cortisone daily for 30 days, and measurements of the limbs showed that five out of seven cases continued to improve for eight months, and only one case failed to respond to treatment. In addition to the circumference of the leg being reduced, the limb was softened and the patients—treated as out-patients—reported diuresis occurring with treatment.

The results of Laigret *et al.* (1957) are difficult to evaluate, as drug therapy was combined with Unna's paste bandages and no comparable series showing the effect of these methods alone is given. Thooris (1953), however, reported good results with Unna's paste bandages.

Sumbramaniam and Mohammed (1957) reported a temporary improvement in two out of nine cases treated with 60 mg. of cortisone a day for seven days, followed by a reduced dose of 30 mg. a day for 15 days, then 15 mg. daily for a further 10 days.

If Markell and Kerrest are correct in their claim that the dose must be high, it is difficult to see why the prednisolone given in the present series failed to produce improvement, as the dose given was equivalent to the dose of cortisone used by them. Since the cases in their series were treated as out-patients, and the one successful case in the present series was ambulant during treatment, it is possible that the drug acts better under these conditions. One might postulate that muscular contractions facilitate flow in the lymphatic vessels, and that if a block exists in the gland or vessel, and is removed either partially or completely by the drug,

the fluid accumulated in the limb would pass into the circulation and eventually be excreted, leading to a diuresis.

It is interesting to note that the series in which these drugs failed to alleviate the swelling of elephantiasis were from areas in which the microfilariae show periodicity—East and West Africa and India. The successful results are from an area where the microfilariae show no periodicity—Tahiti.

Effect of Prednisolone on Microfilaraemia

It might be argued that in elephantiasis the action of prednisolone is not the same as that of cortisone. One patient in the present series, however, had a low-density microfilaraemia, and during the third week of treatment the number of microfilariae increased (Table II) as they did at the same time in one of Markell's cases.

TABLE II.—*Increase in Microfilarial Density During Prednisolone Therapy*

Date	Comment	Quantity of Blood	No. of Slides Positive	Total Microfilariae
1/12/57	Before treatment	2 thick unmeasured smears	1	1
9/12/57	,, ,,	6 × 20 c.mm.	0	0
16/12/57	Prednisolone started	5 × 20 c.mm.	0	0
8/1/58		4 × 20 c.mm.	3	3
14/1/58	,, finished	6 × 20 c.mm.	5	10
21/1/58		6 × 20 c.mm.	5	7
24/1/58		6 × 20 c.mm.	3	3
18/3/58		5 × 20 c.mm.	0	0

Markell and Kerrest (1955) claimed that this was due to the release of microfilariae from blocked lymphatics. If this is a true explanation of the increased microfilarial density, the fact that it occurred with prednisolone suggests that this drug should lead also to the passage of fluid through previously blocked or partially blocked lymphatics, with a reduction in size of the limb. A slight temporary reduction did occur during treatment, as in most of the other cases, but the swelling recurred as soon as the treatment stopped and the patient was fully mobile.

It has been suggested that the absence of microfilaraemia in most cases of elephantiasis is due to the embryos being unable to pass the fibrosed lymph nodes (Acton and Rao, 1933 ; Napier, 1944). This implies that live adult filarial worms in elephantiasis are confined to the diseased limb. Bahr (1912) and O'Connor and Hulse (1935), however, found that in infected persons at post-mortem examination many of the lymph nodes in the body may be invaded.

If, in spite of this, the above is a correct explanation of the absence of microfilaraemia in cases of elephantiasis, continuous reinfection of the individual in endemic areas might be expected with the later development of microfilaraemia. In a series of elephantiasis cases reported by Galliard, Mille, and Robinson (1949) there was, however, no increase in the microfilaraemia rate in the higher age-groups of a series of elephantoid patients. Unpublished work in Tanganyika confirms this, and it suggests that reinfection does not take place. This may indicate that immune processes, which may be the cause of, or be caused by, the elephantiasis, are operative, and may be responsible for the very low incidence of microfilaraemia in these cases.

It is suggested that, in elephantiasis, steroids may alter the immune reactions and prevent the destruction of microfilariae during treatment, but that, when treatment ceases, normal immune processes become manifest and the numbers of microfilariae are reduced again. Support for this hypothesis is provided by the work of Markell and Lewis (1957), who showed in rats that cortisone reduced the immunity to subsequent reinfection with trichinellae.

Among hospital in-patients, aborting females and persons with trauma were found to have a higher incidence of microfilaraemia than patients with other complaints. It was suggested that this might be due to products from damaged tissues (Jordan, 1954). In view, however, of the effect of steroids on microfilaraemia (at least in the case of elephantiasis) it seems more likely that it is due to hydrocortisone, the production of which is increased after trauma and doubled during pregnancy (Cope, 1959).

Summary

Prednisolone was given to seven persons with elephantiasis. In one early case the swelling of the limb and the condition of the skin improved with treatment.

Microfilariae in one patient increased in numbers during treatment but became fewer after treatment. The cause of this is discussed.

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" Science is inevitable, not only because its methods are the only proved methods for increasing the understanding of the world in which we have our being, but also because even those who are not concerned with this understanding make it inevitable through their demands for the physical fruits of science. So it is that, while the scientific method may, at times, have had to be defended, science as such has never had to sell itself—for the good reason that it enjoys an infinite 'sellers' market.' Science, we can say, is inevitable, even though the social consequences of its advances and of the application of these advances have to be entrusted to the future, an enlightened and impartial judge, as de Tocqueville wrote, but one who sits, alas, always too late." (Professor Sir Solly Zuckerman, F.R.S.: Stephen Paget Memorial Lecture. *Conquest. The Journal of the Research Defence Society*, January, 1960.)