eyes of stillborn infants and of those dying in the early weeks of life, and hope that this will throw some light on the problem.

Summary

Histological appearances of nine eyes enucleated in the late stage of retrolental fibroplasia are described.

It is considered that the condition is inflammatory in origin, but the cause of the irritation cannot be deduced from the histology.

We are grateful to the surgeons of the Oxford Eye Hospital for permission to use the histories of cases under their charge.

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A CASE OF POLYARTERITIS NODOSA TREATED WITH CORTISONE

BY

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The following case of polyarteritis nodosa is reported in order to demonstrate that cortisone can heal the characteristic lesions, and to show that the use of the drug in the later stages of the disease may have undesired sequelae.

Case Report

A male shop assistant aged 47 was referred to Professor Henry Moore in November, 1950, by Dr. Michael Kelleher, for investigation of persistent leg pain. The family history was no help, but the previous personal history was one of sporadic illnesses since 1945.

In 1945 his right maxillary antrum was drained, and two weeks later he developed joint stiffness, which was diagnosed as "rheumatic fever." These joint symptoms persisted for several weeks. Some weeks later he developed a chest complaint which was diagnosed as "pneumonia."

No information regarding treatment during this period could be obtained. Special attention was directed to the question of sulphonamide therapy because of the possibility that there may be some connexion between polyarteritis nodosa and the sulphonamides. It seems probable that the patient did receive these drugs, but we have been unable to obtain definite information on this point.

From the end of 1945 he had no definite ailments, but there was a gradual loss of weight until July, 1950, when he began to suffer from loss of energy, night sweats, and a productive cough. Later he developed pain in a small area of

the right calf, which gradually became more severe and spread over the entire calf. A similar pain then began in the left calf.

On admission clinical examination was unrewarding; observation showed an evening pyrexia. The latter, together with the loss of energy and of weight and the occurrence of night sweats, suggested a diagnosis of phthisis. This was not substantiated by a radiograph.

The blood pressure was normal. The urine contained a moderate quantity of albumin, a few granular casts, and a few red cells. The urinary findings were constant on repeated examination. The blood urea was 51 mg. per 100 ml. Total and differential white cell counts were normal. The Widal reaction and blood culture were negative.

Renal tuberculosis was then considered, but no tubercle bacilli were demonstrated on repeated examination of the urine, and excretion urography was normal.

Over a period of seven days the leg pains became more intense; the upper limbs also became painful and the patient complained of marked weakness. The following abnormal nervous signs were noted: (1) In the upper limbs there was generalized wasting and weakness consistent with the poor physical health. (2) In the right hand there was paralysis of the thenar muscles with complete loss of power in the opponens pollicis and the abductor pollicis brevis. Perception of pin-prick and light touch was lost over the entire volar surface of the thumb and first two fingers and over the distal third of the dorsal surface. (3) On the left forearm along the medial border was an oval area extending from elbow to wrist where pin-prick and light touch were not appreciated. The patient complained of numbness in this area. (4) The deep reflexes were present and equal in both upper limbs. (5) The superficial abdominal reflexes were absent on the right side but present on the left. (6) Both lower limbs were markedly wasted, and weakness was considerable. Pin-prick and light touch were lost over the lateral aspect of the right calf and dorsum of the foot. Postural sense was absent in the right great toe and was impaired in the left. All deep reflexes were absent, and the right plantar response was doubtfully extensor.

The overall picture was that of an asymmetrical polyneuritis involving the lower limbs, with median neuritis of the right hand and a lesion of the left medial cutaneous nerve of the forearm.

The picture of widespread nervous disorder associated with pyrexia and abnormal urinary findings suggested the possibility of polyarteritis nodosa. Eosinophil counts were carried out every four or five days, and a daily search was made for peripheral arterial nodes. The earlier eosinophil counts were below 300 per c.mm., but on the 18th day in hospital the count rose to 3,450 per c.mm. This was regarded as strong collateral evidence in favour of the suspected diagnosis. On the 28th day subcutaneous nodes were found in the left upper arm. One node was removed from a superficial branch of the left brachial artery (by Mr. P. Carey). The pathological report confirmed the diagnosis.

On the same day the patient developed a subarachnoid haemorrhage (presumably due to rupture of an intracranial node) and had multiple epileptiform attacks. At this stage cortisone treatment was under active consideration, but was rejected because of shortage of supplies. Later the relatives procured some "cortone" from America and treatment was begun on the 50th day, when the patient's condition was grave. The drug was administered by deep intramuscular injection in single daily doses of 200 mg. for four days followed by 100 mg. for six days—a total of 1.4 g. in 10 days. At the end of this period, 60 days after his admission to hospital, the patient died.

In the terminal stages full neurological examination was repeated and more widespread nervous damage was noted as follows. The patient complained of severe continuous paraesthesia in his hands and feet. The cranial nerves were still normal. The upper limbs were markedly wasted, and

weakness was so intense that small objects could not be held in the hand. All sensation was grossly impaired in both forearms, and all deep reflexes were absent. Both lower limbs were wasted; bilateral foot-drop and trophic changes in the skin of the feet were observed. There was a flaccid paraplegia with gross impairment of superficial and deep sensation below the knees. All deep reflexes in the lower limbs were absent and the plantar response could not be elicited owing to the widespread motor and sensory changes. The clinical condition was now an advanced polyneuritis.

During the last few days of life scattered petechiae appeared in the skin and multiple small haemoptyses occurred. Involvement of mesenteric vessels was suspected because there occurred considerable abdominal pain, rigidity of the abdominal wall, and vomiting. The ultimate cause of death was renal failure—on the 30th day in hospital the urea clearance figure was 30 and the blood urea rose continuously to the final recorded figure of 216 mg. per 100 ml. At no time were changes noted in the electrocardiogram, and at repeated examinations the eyegrounds were normal.

Pathological Findings.—The biopsy specimen received for examination was a small piece of subcutaneous fibro-

branches of the mesenteric arteries and of the arteries to the omenta. A major jejunal branch of the superior mesenteric artery was thrombosed.

The surface of the liver (1,090 g.) was markedly granular. The cut surface showed the typical "nutmeg" mottling of advanced venous congestion. The spleen (95 g.) was small and firm but appeared normal. Both kidneys (right 142 g., left 120 g.) were pale. The capsules stripped easily, leaving a finely granular surface. On section the cortico-medullary demarcation was clear. The normal striations were lost. A fine greyish mottling of the cortex was present, but the glomeruli were not especially prominent. Running from the pyramids to the periphery there were several small sharply defined white infarcts. The suprarenal glands (right 3.8 g., left 4.2 g.) were normal in size and appearance.

Histology

Fibrinoid necrosis of small arteries, associated with periarterial fibrosis and in many cases partial or complete obliteration of the lumen of the vessel by newly formed fibrous tissue, was very extensive (Fig. 2). Lesions of this

FIG. 1.—Lesion in subcutaneous tissue of forearm before administration of cortisone. (Biopsy material. $\times 30$.)

lipomatous tissue. On histological examination a small artery was seen in the specimen. The vessel showed fibrinoid necrosis and marked periarterial infiltration by polymorphs and lymphocytes (Fig. 1). The lesion was typical of polyarteritis nodosa in the acute phase.

Necropsy Findings

A small haemorrhage was present in the occipital pole of the right cerebral hemisphere (brain, 1,550 g.).

Both lungs (right 1,130 g., left 1,020 g.) showed congestion and oedema of the lower lobes. A small area of pleural thickening was present at the apex of the left upper lobe. A thin layer of healed tuberculous scar tissue was present at both apices. A number of small infarcts were visible. These were most numerous in the right lung and in the lower lobe of the left lung. A slight degree of acute fibrinous pericarditis was present. The heart (380 g.) appeared normal. The aorta showed a minimal degree of atheroma.

Extensive superficial erosions of the mucosa of the oesophagus were present. The gastric mucosa was atrophic and showed almost complete absence of rugae. The mucosa of the small intestine appeared normal. Numerous small white fibrous nodules (1 to 2 mm.) were visible on the smaller

FIG. 2.—Lesion in biceps muscle after administration of cortisone. (Necropsy material. $\times 60$.)

type were widespread in the voluntary muscles, the lungs, the liver, the mesentery, and the kidneys.

Frequently fibrosis had progressed to such an extent that the only indication of an artery being involved was the presence of a ring of deeply eosinophilic hyaline material in a fibrous nodule, this ring representing the original arterial wall. Inflammatory cells were not present in these lesions. Detailed search failed to reveal any lesion comparable to the acute phase polyarteritic lesion found in the biopsy specimen.

Thrombosis of the medium-sized arteries was also of widespread occurrence. Collections of polymorphs were frequent in the lumina of the thrombosed vessels but not in the perivascular tissue.

The lungs showed leucocytic infiltration of the alveoli near the infarcted areas. Central zonal congestion of the liver was marked. The kidneys showed a necrotizing glomerulitis with fibrinoid necrosis of the tufts. The glomerular lesion was of irregular distribution, many glomeruli appearing normal. Degeneration of the tubular epithelium and oedema and cellular infiltration of the interstitial tissue were marked. Many tubules contained collections of leucocytes. Venous congestion both of the kidneys and of the suprarenal glands was prominent.

Discussion

To us the most interesting features of this case are the neurological findings and the effect of cortisone. The neurological findings noted at the first examination are well expressed by the term "mononeuritis multiplex," which was introduced by Lovshin and Kernohan (1949), who recorded such findings in eight cases. These manifestations, when present, are very suggestive of polyarteritis nodosa, particularly if there be pyrexia and signs suggesting dysfunction of other organs or systems. The findings at the second examination were those of an advanced polyneuritis, and indicate the necessity of considering polyarteritis nodosa in all cases of peripheral neuritis.

Histological examination of the necropsy material demonstrates the absence of an inflammatory infiltration around the areas of fibrinoid necrosis in the smaller arteries. When considered in relation to the intense perivascular inflammatory infiltration present in the biopsy specimen obtained 32 days before death it seems justifiable to regard the change as due to cortisone. This is in accordance with the findings of Shick, Baggenstoss, and Polley (1950), who treated three cases with cortisone. Two patients died in cardiac and renal failure in spite of initial improvement. Necropsy showed complete healing of all arterial lesions, but with the process of healing fibrous obliteration of the lumen of the vessels had occurred with widespread visceral infarction.

It is therefore evident that cortisone can be a two-edged weapon. If it eventually proves to be of value in the treatment of polyarteritis nodosa it will be of great importance to begin treatment at such an early stage that healing of affected vessels will not provoke serious visceral infarction. In consequence the early diagnosis of polyarteritis nodosa is desirable so that the effect of cortisone given at the onset of the disease can be investigated. As can be seen from the present and other recorded cases, this, in spite of a high index of suspicion, may be extremely difficult.

We wish to thank Professor Henry Moore for permission to publish this case.

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The U.S. Army medical service, in co-operation with the U.S. Department of Agriculture, has developed and is now using in Korea new insecticidal formulations capable of controlling Korean body lice which are resistant to D.D.T. These are preparations of lindane and pyrethrum louse powder which are highly effective against the Korean louse and have been tested and declared safe for human use by the Army Environmental Health Laboratory, Edgewood, Maryland. Army medical personnel will soon begin mass dusting of P.O.W.s with 100,000 lb. of lindane, which was shipped to Korea early this month. One million pounds of equally effective pyrethrum powder have been procured and will be put in use upon arrival in the Far East. Half of this amount will be distributed in 2-oz. individual cans to United Nations troops. Intensive dusting of the civilian population will start as soon as additional supplies of the powders are available. United Nations forces have been relatively untroubled by the stubborn Korean louse principally because of the accomplishments of preventive medicine companies, strict sanitary discipline in the field, and regular baths and change of clothes for combat troops. Routine immunization against epidemic typhus has furnished additional protection against this disease.

GASTRIC CARCINOMA AND ACUTE PERFORATION

BY

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Until recently acute perforation was regarded as a rare complication of carcinoma of the stomach. The prognosis, both immediate and remote, was generally regarded as very poor. Aird (1935) published eight cases from the Edinburgh Royal Infirmary and collected 71 cases from the literature. He found that about half the cases mimicked perforated peptic ulcer, and he stated that in nearly 50% metastases were present at operation.

Incidence

Doll (1950) has put the matter in its proper perspective. He found 17 cases of carcinoma in a consecutive series of 500 perforations, 11 occurring in 452 cases submitted to operation. Of 86 male cases with an operation diagnosis of perforated gastric ulcer, seven proved to be malignant.

Unfortunately, it is difficult to assess the risk of malignancy in perforated gastric ulcer. The exact anatomical site of the perforation is frequently uncertain, oedema at operation often masking the pylorus. Many perforations are therefore labelled by the surgeon "juxtapyloric." Many of these ulcers no doubt are duodenal, but some are in the prepyloric inch. Illingworth *et al.* (1944), Avery Jones *et al.* (1950), and others include these "juxtapyloric" ulcers in the duodenal ulcer group. By subtracting them from the gastric ulcers the apparent incidence of malignancy in gastric ulcers will be increased. Post-operative determination of the exact site of the ulcer may be equally difficult. The radiologist often finds it impossible to locate the pylorus because of distortion and irritability, and the ulcer may be beyond the range of the gastroscope. A further source of error is the possibility of carcinoma manifesting itself much later, to exclude which all perforated gastric ulcers would have to be followed up for at least five years.

In an attempt to assess the risk of malignancy in perforated gastric ulcer the records of all gastric and duodenal perforations admitted to the London Hospital between January 1, 1945, and December 31, 1949, have been studied. Table I shows the distribution of the 111

TABLE I.—Cases of Acute Perforation at the London Hospital, 1945-9. Site of Perforation

	Diagnosis at Operation	Final Diagnosis	Deaths
D.U.	57	74*	7
G.U.	12	12	3
Juxtapyloric	28	17	0
Gastrojejunal	1	1	0
Carcinoma	3	6	2
Not proved	—	1	1
Total	101	111	13

* Includes one patient with two perforations in the period.

cases admitted, and gives the diagnosis made at operation in 101 cases. The final diagnosis is that made when the patient was last seen at this hospital. There is a substantial increase in the number of duodenal ulcers in the final list, mainly at the expense of the juxtapyloric group. Table II shows the primary treatment adopted