It is generally agreed that the severe fibrosis and loss of muscle fibres seen in the atrial wall in this condition are evidence of particularly severe local damage from the original rheumatic process, and that this is the prime causal factor of the extreme dilatation. Observation that the pressures in the left atrium are as high in mitral stenosis as in mitral incompetence (Venner and Holling, 1953) suggested that mitral incompetence need not be a concomitant factor, and it was of particular interest to observe this patient, in whom the physical signs were clearly those of mitral stenosis and in whom the left atrial pressure (at operation) was only moderately increased.

The diagnosis of mitral incompetence is difficult, and many of the accepted physical signs are unreliable, especially when there is also stenosis—although it seems to be general experience that where the physical signs are purely those of mitral stenosis alone (tapping apex beat, slapping first heart sound, mitral opening snap, rumbling apical mid-diastolic murmur), incompetence of an important degree is not found at operation. The case reported here offers a further illustration of this point and also shows that massive dilatation of the left atrium is not unequivocal evidence of mitral incompetence. In rheumatic heart disease both massive left atrium and gross mitral incompetence appear to result from a particularly severe rheumatic injury and their observed association probably depends on this fact alone.

I wish to thank Dr. C. G. Baker and Mr. R. C. Brock for encouragement to prepare this report.

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INTRA-ARTERIAL THERAPY IN OCCLUSIVE VASCULAR DISEASE

BY

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Degenerative arterial disease of the lower limbs produces intermittent claudication, ischaemic necrosis, or both. At the present time it is not possible to reverse this degenerative process. Consequently, treatment aims at the opening up of a collateral circulation and the abolition of sympathetic tone. Since occlusive vascular disease affects all the vessels in some degree, the best that can be hoped for is the maximal dilatation of all the arteries in the limb. In order to obtain the greatest local effect without a general vasodilatation, injection of drugs direct into the femoral artery has been advocated. Trying a series of drugs, Edwards *et al.* (1952) found papaverine and tolazoline (benzyl-imidazoline, or "prisol") to be most effective in their action, and reported some success in the treatment of these cases.

Selection and Technique

The present investigation was deliberately kept on an entirely clinical basis, as the object was to assess the value of these two drugs as a routine method of treatment in a busy peripheral vascular clinic. No attempt was made to measure the effects instrumentally by temperature change, oscilometer, or claudicometer. It was thought that if such therapy was to be of practical value it must produce symptomatic improvement. With this in mind the following procedure was adopted. Any patient arriving at the peripheral

vascular clinic suffering from intermittent claudication or ischaemic necrosis due to occlusive vascular disease was, without selection, started on a course of injections. The first 20 were given papaverine and the next 20 tolazoline. Both legs were treated when both were the subject of complaint. The course consisted of one injection a week into each artery for six consecutive weeks. The amounts used were papaverine 40 mg. in 20 ml. of saline and tolazoline 100 mg. in 20 ml. A 20-ml. syringe fitted with a No. 17 B.W.G. needle which had been ground down to a short bevel was used and the injections were made into the femoral artery immediately below Poupart's ligament. After a little practice no difficulty was experienced in the introduction, the injection being made against the flow of the blood. No local analgesic was used, and the patients were allowed to travel home shortly after the treatment. No untoward happenings occurred.

The sex and age groups of patients in the series are shown in Table I.

TABLE I.—Sex and Age Groups of Patients

Drug	Male	Female	Age Range			70+
			40-49	50-59	60-69	
Papaverine ..	18	2	2	8	7	3
Tolazoline ..	16	4	2	9	8	1

Results

Immediate Effect.—On making the injection most patients showed a rapid response with a local flush. This was most pronounced in the thigh, and almost always demonstrated the territory of the superficial external pudendal artery by a flush over the pubes. However, the extent down the limb varied, as did the patient's impression of warmth. In some it went as far as the knee; in others it included the whole limb. With tolazoline a general vasodilatation rapidly followed, and often shivering. The local flush was quite transient, lasting between 10 and 30 minutes. After this the patient felt quite normal. These injections were made by four different workers.

Assessment of the result was made by seeing the patient two weeks after finishing the course and again a month later. In the case of intermittent claudication he was asked how far he could now walk, and he was allowed to compare this with some definite distance he had to walk during the day. His own estimate had already been recorded before starting treatment. Usually it was possible to find how far he walked without pain first thing in the morning—for example, on going to work. In assessing these results alleged improvements or deteriorations of a few yards were

TABLE II.—Response in Intermittent Claudication

Drug	No. of Cases	Immediate Flush to Toes	Final Improvement
Papaverine ..	15	9	0
Tolazoline ..	13	7	2
Total ..	28	16	2

TABLE III.—Response in Ischaemic Necrosis

Drug	No. of Cases	Immediate Flush to Toes	Final Improvement
Papaverine ..	5	5	5
Tolazoline ..	7	5	4
Total ..	12	10	9

neglected—bearing in mind the stated object of the inquiry. Again four persons were engaged in the assessing. In ischaemic necrosis the healing was taken as the criterion, local treatment being confined to a dry dressing and crêpe bandage.

Tables II and III summarize the results in intermittent claudication and ischaemic necrosis respectively.

Discussion

Although this series was kept small because of the possible consequences of repeated arterial puncture, I feel that the results are significant. It seems that in intermittent claudication the benefits do not warrant this treatment. In ischaemic necrosis it would appear to be a worth-while procedure, especially as it can be performed in an out-patient clinic. Moreover, it seems to be a good alternative to lumbar sympathectomy, and can, of course, be applied to patients unfit on general grounds for a major operation. However, the results seem to suggest that the mechanism is just like that of sympathectomy in that the skin receives more benefit than the muscles; and this observation agrees with the findings of Lynn (1950), although he quotes Dr. H. T. C. Swan as having found increased blood flow in the sympathectomized hand after intra-arterial injection. Perhaps, too, the explanation lies partly in the transience of the response, the healing of an ulcer being helped even by a short-lived increase in blood supply. Indeed, Wilson and Quash (1951), studying the effects of tolazoline, also came to the conclusion that it was valuable in the treatment of refractory leg ulcers. It is worthy of note that Douthwaite and Finnegan (1950) were impressed by the results of oral tolazoline in patients with intermittent claudication.

It would be interesting to compare the results of intra-arterial injection with those of lumbar sympathetic block with phenol in the cases of ischaemic necrosis. Such a series is at present being investigated, but, of course, takes a longer time to complete, as ischaemic cases are less frequent than those with intermittent claudication.

Summary

A series of cases is described in which obliterative arterial disease of the lower limb has been treated by intra-arterial injections. Broadly, two groups of cases arise, one complaining principally of intermittent claudication and the other of ischaemic necrosis. The drugs used were papaverine and tolazoline. The results are assessed on a clinical basis with a view to finding a practical line of therapy.

The opinion is expressed that in intermittent claudication the method is not warrantable, whilst in ischaemic necrosis it may be a valuable adjunct to local treatment.

I wish to thank Mr. Clifford Jones, in whose peripheral vascular clinic this work was carried out, for his help and encouragement; and Mr. H. Ellis, Dr. F. Lothe, and Dr. H. W. Chambers for practical assistance.

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The Minister of Health, Mr. IAIN MACLEOD, speaking at the annual luncheon of the Hotel and Catering Institute in London, said that he was looking to hospital authorities to give a lead in standards of cooking and kitchen hygiene. He was pleased to say that the national scheme for training apprentice cooks in hospitals was getting off to a good start. Although the hospital authorities were only given details of the scheme in March, preliminary inquiries had already been received from over 80. Some idea of the extent of catering in hospitals could be gained from the budget for food in hospitals in England and Wales, he continued. In the year 1952-3 the cost was over £30m., or about one-eighth of the total expenditure of the hospital authorities. In addition, the wages of catering officers, dietitians, and other senior catering staff amounted to nearly £7m.

Medical Memoranda

Ulcerative Stomatitis Associated with Symptoms of Peptic Ulcer

The following case is of interest from both a diagnostic and a therapeutic point of view, and is one which I have had the opportunity of observing over a long period.

CASE REPORT

A woman aged 56 had had intermittent indigestion for many years. Her pain was epigastric, occurred half to one hour after food, was increased by meat, soups, and any form of alcohol, and was relieved by alkalis. There were periods of freedom, and the picture appeared to be typical of peptic ulceration. The blood count was normal. This diagnosis was reinforced by the family history. Her father had had a gastro-enterostomy for duodenal ulcer, a paternal uncle had died of a perforated duodenal ulcer, and two paternal cousins had had duodenal ulcers, in one of whom the ulcer had perforated. On the other hand, a paternal grandfather had died of pernicious anaemia.

Eighteen months previously the patient had developed ulcers of the mouth and tongue. At first they were intermittent, but later the exacerbations became so frequent that she was never entirely free. She could not eat with comfort, and spiced foods, vinegar, and alcohol produced considerable distress. During this period the indigestion also became worse, and invariably followed a heavy meal. Six months later she had agreed to have a barium meal and a gastric analysis. The x-ray film showed no abnormality and the gastric analysis a complete achlorhydria. Hydrochloric acid was given, but was soon abandoned as it increased the dyspepsia, which indeed continued to be relieved by alkali. The ulceration of the mouth got worse and nothing gave any relief, although the pain subsided temporarily with an alkaline mouth wash.

Two months ago I decided to try vitamin B₁₂, which was given in the form of "cytamen." At first she had an injection of 50 µg. (1 ml.) twice weekly; this was reduced to 1 ml. a week and eventually to 1 ml. a fortnight. Within a few days the ulcers had improved and in a week they had disappeared and have never returned. The indigestion also improved and she was able to take a normal diet and an occasional glass of sherry without any discomfort. She felt better than she had been for many years.

COMMENT

In this case all the symptoms suggested peptic ulcer, but the x-ray examination was negative and achlorhydria was present. There was an ulceration of the mouth and tongue, which was intermittent as in peptic ulceration. The family history of duodenal ulcer suggested that hyperchlorhydria was present in many members. On the other hand, the history of a grandparent who suffered from pernicious anaemia is evidence of another hereditary factor which produces an achlorhydria.

The theory I would put forward is that in my patient the two factors were present, but the tendency to ulceration was kept in check by the absence of acid, which prevented any gross and demonstrable ulceration from occurring. The administration of acid undoubtedly increased the indigestion, and it is probable that it would have led to frank ulceration if it had been persisted in. The simultaneous appearance of ulceration in the mouth and the increase in the indigestion, together with the immediate relief of both by vitamin B₁₂, suggests that the superficial ulceration of the mouth was associated with a similar condition in the stomach, and that the cause of both was the absence of some constitutional factor which was replaced by the injection.

The temporary relief from the indigestion brought about by alkali cannot be explained by neutralization, but was due to some other cause, and its action was similar to that