500 units, but in such patients he should aspirate the gastric contents, as extreme gastric dilatation is sure to be present and the patient may improve enough to vomit in the ambulance and inspire his vomit.

Any physician who has ever treated diabetic coma in the patient's own home must agree that, though of course one may succeed, the difficulties are so great and the unpleasant surprises so numerous that home treatment should rarely if ever be undertaken.

Summary

The line of treatment of diabetic coma given by Root and his colleagues in Boston is advocated.

The essential point is large insulin dosage at an early stage. Physicians less experienced than Root and working in less well-equipped clinics should deliberately err on the side of giving larger doses than the experts, for there is no danger in giving too much and every danger in giving too little.

Gastric aspiration must be carried out as routine in every case and nothing be given by the mouth during the critical first few hours.

Intravenous saline is needed by many cases and by all the severe cases, sometimes in very large quantities. The syndrome of potassium depletion must be rare, but the possibility should be kept in mind.

Glucose must not be given by any route until clinical recovery has begun, but after this it may safely be given to prevent hypoglycaemic attacks.

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TREATMENT OF CHRONIC VARICOSE ULCERS BY LUMBAR SYMPATHECTOMY

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Chronic varicose ulcers heal slowly, relapse easily, and remain a source of constant annoyance to those they affect. Some tend to heal in summer, some with or in spite of the application of lotio rubra, scarlet red, sulphonamide, or penicillin powders, some following protection by Unna's paste or "elastoplast"; some respond to sclerosing treatment of the causative veins or after Trendelenburg's operation with high and low ties, some even requiring skin-grafting. Yet many, even after this gamut of medical and surgical treatment, remain a chronic antisocial disability to their unfortunate owners.

Case 1

A man aged 49 was admitted to Southend General Hospital on Sept. 9, 1946, with a history of varicose veins in his left leg associated with a large left varicose ulcer for 27 years. He had had a flesh gunshot wound in this leg below the knee in 1917, without peripheral nerve injury. In 1937 a left saphena varix had been excised. In spite of a wide range of local treatment the ulcer never healed even after lengthy periods of rest in bed. The Wassermann reaction was negative.

On June 8, 1946, two varices were excised from the left femoral triangle and several others from the left popliteal fossa. On reporting to the out-patient department on Aug. 17 he complained of the ulcer, which was larger than before,

together with pain and swelling in the left leg. There was thrombophlebitis of the branches of the saphena magna vein. On Sept. 9, there being no improvement, he was admitted. The ulcer, situated just above the medial malleolus, measured 5 by 3 cm.

The leg was elevated and the ulcer covered with tulle gras. Sulphadiazine, 14 g., was given orally for two days. The swelling rapidly subsided and the phlebitis regressed, but the ulcer remained the same. Its cure became the next problem, for it greatly handicapped him in his work as a painter.

On examining him afresh what impressed us most was the coldness of the limb, together with its cyanotic appearance compared with his normal right leg. The cutaneous circulation was obviously poor. It occurred to us that, if only the blood supply to the skin could be improved, healing of the ulcer might occur spontaneously. The ulcer maintained its existence as a result of the state of stagnant anoxia which surrounded it. Almost it was an "anoxic ulcer." Arguing on the analogy that head wounds, with a rich blood supply, heal quickly and remain healed, we decided to try the effect of a lumbar paravertebral block of the sympathetic nervous system in improving the cutaneous circulation. Following the infiltration of 100 ml. of 0.5% procaine solution along the left side of the lumbar vertebral column there was a remarkable improvement in the colour and warmth of the limb which persisted for 24 hours. As we did not have a skin thermometer the exact temperature rise could not be measured, but the patient had no doubt at all that his left leg was warmer.

Operation.—After considerable thought, in view of the attendant risks of any operation, we suggested that his ulcer might be "cured" by left lumbar sympathectomy. So far as we were aware at that time, this had not been tried for varicose ulcer before. It was an experiment, and we could not guarantee the result. The patient accepted. On Sept. 27 left lumbar ganglionectomy was successfully performed, the second, third, and fourth lumbar ganglia being removed. In the left leg there was an immediate rise in temperature, which has persisted.

Fourteen days after operation the ulcer was healed for the first time in 27 years. When seen on June 7, 1947, he was extremely fit and well; the skin was healthy, the scar soft. He said he felt ten years younger. On Sept. 11 his leg was still healed. No pulse difference was detected in the femoral, anterior, or posterior tibial vessels of the right and left legs. To prevent swelling he wears a below-knee elastic stocking. On May 13, 1948, he reported that the ulcer was still soundly healed.

Case 2

A married woman aged 57 was admitted on Dec. 31, 1946, with a left varicose ulcer which had persisted for 15 years, it being the result of a left "white leg." Three years after onset of the ulcer she developed "phlebitis" in her left leg following injection treatment for varicose veins. On Nov. 13, 1945, one vein was tied below the left knee, with slight improvement in the ulcer and surrounding weeping eczema.

Physical examination showed a fit corpulent woman. On the medial surface of the left leg were two chronic ulcers, each 4 by 2.5 cm., surrounded by a large area of weeping eczema and pigmentation extending half-way up the leg, which was cold and blue. There were no large varicose veins now. Her Wassermann and Kahn reactions were negative, and her urine was normal. She was finding the leg an increasing source of annoyance. After a left paravertebral block there was marked vasodilatation.

On Jan. 3, 1947, a left lumbar sympathectomy was performed. By Jan. 16 the ulcer had healed for the first time in 15 years. The patient was discharged with instructions to apply calamine lotion to the varicose eczema and to keep the skin protected with a crepe bandage. When seen on June 7 her ulcer was soundly healed and the skin healthy. She said that eczema still occasionally bothered her. When seen on Sept. 11 the eczema, which was some distance from the healed ulcer, was weeping. The ulcer had healed leaving a thick scar, which later might well be excised and skin-grafted. No elastic support had been worn, but one was on order. On May 18, 1948,

Table of Results

Case No.	Sex	Age	Duration of Ulcer	Past Surgical Treatment	Size of Ulcer	Para-vertebral Block	Lumbar Ganglionectomy	Healed	Follow-up
1	M	49	27 years	1937: left saphena varix excised. 8/6/46: 2 varices in left femoral triangle excised. Deep thrombosis	5 × 3 cm.	Good response	27/9/46: L. 2-4	11/10/46	13/5/48: healed. Wearing elastic stocking
2	F	57	15 years	13/11/45: one varix tied below knee	4 × 2.5 cm.	Good response	3/1/47: L. 2-4	16/1/47	11/9/47: ulcer healed. Eczema persisted 18/5/48: eczema healed. Ulcer broken down. Leg still warm. Wearing elastic stocking
3	F	71	39 years	17/1/46: left Trendelenburg	4 × 1.5 cm.	Good response	21/2/47: L. 2-4	14/3/47	18/5/48: healed. Wearing elastic stocking
4	F	56	16 years	23/10/46: bilateral Trendelenburg	7 × 4 cm.	Good response	22/5/47: L. 2-4	5/6/47	11/9/47: ulcer healed. Some eczema 8/5/48: ulcer healed and skin dry. Wearing elastic stocking

she wrote that the left leg was still warmer than the right; the eczema was healed, but the ulcer had broken down again, and she was now wearing an elastic stocking.

Case 3

A married woman aged 71 was admitted as an "emergency" on Feb. 18, 1947, suffering from the recent onset of a patch of superficial dry gangrene on the ball of her left foot. She had suffered from bilateral varicose veins and a left chronic varicose ulcer for 39 years. On Jan. 17, 1946, a left Trendelenburg operation, with low ties, was performed, with no improvement. On Feb. 12, 1947, she complained of the chronicity of the ulcer and of "something wrong" on the sole of her foot which made her limp. This was a source of great inconvenience, as she kept house for an invalid sister aged 76.

On examination the left leg was cold and blue, with a deep chronic ulcer 4 by 1.5 cm. extending down to the left medial malleolus. There was pronounced scarring of the surrounding tissue with resulting acquired pes cavus. On the ball of the great toe was a patch of superficial dry gangrene 2.5 cm. in diameter. The left posterior tibial pulse under scar tissue was impalpable, the other pulses being present in the right and left legs. The legs were otherwise normal. The Wassermann and Kahn reactions were negative. The haemoglobin was 89%, the blood urea 28 mg. per 100 ml., and blood sugar 81 mg. per 100 ml. Her urine was normal. A radiograph of her legs showed no vascular calcification.

As there was good response to paravertebral block, on Feb. 21, 1947, left lumbar ganglionectomy was performed. There was a dramatic response, the lesion of the sole healing in two weeks. Simultaneously the varicose ulcer improved, being healed in three weeks from the time of operation—the first time in 39 years. When seen on June 7 both areas were soundly healed and the left leg was still warmer than the right. There was now no difficulty in walking. On Sept. 11 her leg and sole were still healed. She wears an elastic stocking, without which the left leg swells. On May 18, 1948, she wrote that her leg was still healed.

Case 4

A married woman aged 56 had suffered from bilateral varicose veins for 19 years and a large varicose ulcer with extensive surrounding eczema for 16 years. There was no history of "white leg." The skin had been unsuccessfully treated with many local applications. On Oct. 23, 1946, a bilateral Trendelenburg operation was performed without healing of the ulcer, which became covered with hard crusts. The eczema continued to weep.

On examination she was seen to be a large, heavily built woman. The right leg was soundly healed, no varicose veins being obvious. The lower half of the left leg was covered with a weeping varicose eczema. Under thick crusts above the medial malleolus was an unhealed ulcerating area approximately 7 by 4 cm. Though the leg was distally cold and blue the pulses were normal. There was a good cutaneous response to paravertebral block. Meanwhile the skin was treated with eusol compresses.

On May 22 a left lumbar ganglionectomy was performed. As a result the eczema dried and the patient was discharged on June 5 with the ulcer healed.

When seen on Sept. 11 the ulcer was still healed, but superficial eczema remained. At times it wept, at times it was dry. There was no swelling of the leg. The pulses on her leg appeared normal, and there was no recurrence of the varicose veins. She had an elastic support on order. On May 8, 1948, she wrote that the leg had been dry since October, 1947. She still wore an elastic stocking.

Discussion

As Richter (1941) rightly says, varicose ulcers can unquestionably be cured by many methods; and as sure as a sufferer has an ulcer, so his doctor has his own remedy. It is a question of *chacun à son goût*. Essentially, however, one treats the cause, which in the above case was the result of long-treated varicose veins where, though the veins had disappeared after a combination of ligation and thrombophlebitis, the cold cyanotic limb and ulcer remained. Infection played a secondary part in the maintenance of the ulcer. Only because all non-operative and all available operative procedures had failed was sympathectomy considered. In Case 3 an early gangrene of the limb was the reason for operation. The varicose ulcer which simultaneously healed was an interesting and instructive incident.

In his masterly review of the aetiology and treatment of varicose ulcers of the leg Homans (1917) divided ulcers into three groups: (1) ulcers of surface varix, (2) ulcers of surface varix complicated by varicosity of the perforating veins of non-inflammatory origin, and (3) same as Group 2 but post-phlebotic in origin. Groups 1 and 2 differ little except that, whereas the ulcer of Group 1 is near the principal superficial veins of the leg, the ulcer of Group 2 not only rides upon the large veins but tends to appear in the region of the perforating veins. Ulcers of Group 3 are decidedly different. They arise on phlebitis following childbirth, fevers, and operations. The valves of the veins are permanently incompetent. After the inflammation there are changes in the leg, with induration of fat and scarring of deep fascia, thus crippling the local lymphatic system, with resulting oedema. The ulcers tend to be rapid in onset, particularly chronic, bear no relation to visible veins, and have little or no tendency to heal even with rest in bed. We feel that Cases 1 and 2 finally belonged to Group 3, while Cases 3 and 4 were probably Group 2. In cases such as these Homans ligated the varicose veins first, and if no healing occurred he excised the ulcer and skin-grafted the raw area.

Some workers have used lumbar sympathectomy as a means of curing chronic varicose ulcers. The South Americans were early in the field. Gordon (1940) condemns its use, having had ten cases each of which showed initial prompt healing but nine of which recurred in less than one year. He favours excision of deep fascia of the leg together with a thick Thiersch graft if the overlying covering is poor.

Gravelle and O'Donnell (1946) in a review of 21 cases, of which six had stasis ulcers in contrast to arteriolar and traumatic ulcers, found all the results were "good"—the longest follow-up period being 18 months.

Adams (1942) writes: "There are two types of varicose ulcers that are particularly benefited by lumbar sympathectomy in addition to indicated therapy of the forms already enumerated. One is seen in the constantly moist, sweating leg in which fungous infection is uncontrollable by medical measures. Sympathectomy abolishes the sudomotor activity, makes the skin dry and warm, allows fungous infection to be controlled and healing to be maintained. The other type is characterized by multiple punched-out, circular ulcers on brawny, cyanotic legs secondary to deep obliterative thrombophlebitis. Although peripheral pulsations may be present and of good quality, a glance at the leg is convincing evidence that the tissue circulation is inadequate to meet its metabolic needs, and hence the ulceration has occurred. Venospasm, lymphatic blockage, and postural stasis all may be contributing factors. The important practical fact, however, is that sympathectomy, by relaxing the spasm and improving the collateral circulation, will sometimes bring healing in this distressing group of cases that we otherwise have been forced to admit are incurable by any methods at our command."

The most arresting fact in our series was the rapidity with which the ulcers, present from 15 to 39 years, healed within three weeks and remained healed throughout two winters.

In choosing the method of treatment for recurrent varicose ulcer of the leg it is essential to consider the patient's economic status and the nature of his work. There is no doubt that many find a chronic ulcer a debilitating condition. Young people, especially men, can ill afford to continue losing time and efficiency. Every effort should be made to heal these ulcers quickly, and if sympathetic surgery is indicated it should be tried.

Homans observed that, even after the ulcers had apparently healed with skin-grafting, the grafts sometimes separated when the patient walked again. Cyanosis of the graft and oedema of the ankle were his danger signs. He therefore advised three weeks' post-operative rest in bed, with active and passive leg exercises besides massage, before the patient was allowed up.

Battle (1947), discussing the results of his series treated by skin-graft, likewise mentioned that several cases which at first appeared to have successful "takes" broke down soon after walking was recommenced, usually within six weeks of operation. Surely the answer to this failure is that skin-grafting, like tree-transplanting, requires suitable soil. If the ground is waterlogged and stagnant a tree transplanted there dies. So, too, did these grafts. We believe that with such patients the correct approach might well be first to improve the peripheral circulation by lumbar sympathectomy and then to graft the skin on a favourable "soil." We believe, too, that the wearing of an elastic bandage post-operatively to be very important. It protects the skin from trauma without and from oedema within.

One may well ask, Is such a condition really worthy of such attention and such treatment? The answer, we believe, is yes. If these already overtreated ulcers can be healed permanently by this method or by combining it with fascial excision and skin-grafting—and the answer, as with all "cures," still lies a lifetime down the years—then will be removed another source of chronic disability and loss of manpower from humanity. One thing, however, is certain—nothing is so profound as the heartfelt gratitude of three of these four people on being thus far released from the tedium of chronic discharging septic sores on their legs.

Summary and Conclusions

Varicose ulcers may fail to heal even after the entire gamut of usual medical and surgical treatment.

Four such patients, with ulcers present from 15 to 39 years, were found to have cold blue limbs which responded by cutaneous vasodilatation to lumbar paravertebral block.

After lumbar sympathectomy these ulcers healed within three weeks. In three cases they have remained healed.

The value of lumbar sympathectomy in providing an adequate circulation to assist healing is thus demonstrated and its use before skin-grafting suggested.

The importance of continuing to wear an elastic stocking after treatment to protect the skin from trauma from without and oedema from within is stressed.

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Medical Memoranda

Twin Pregnancy with Acute Hydramnios Treated by Paracentesis Uteri

The following is a report of a case of acute hydramnios occurring in a twin pregnancy and resulting in the birth of one live twin and one foetus papyraceus after treatment by abdominal paracentesis uteri.

CASE REPORT

The patient, a multiparous gipsy aged 25, was admitted to hospital on May 18, 1947, on account of acute hydramnios. Her last menstrual period had begun on Nov. 13, 1946, but instead of being six months in size the uterus had the dimensions of a full-term pregnancy. There was a history of sudden abdominal enlargement with discomfort for the past few days, and of severe abdominal pain during the 24 hours preceding admission. The foetal heart sounds could not be heard, and parts were difficult to identify, although external ballottement was just possible. The patient was in considerable pain, requiring an injection of morphine a few hours after admission. The uterus, though distended, tense, and tender, was not "board-like" as in concealed ante-partum haemorrhage, and it was concluded that the excessive uterine enlargement was due to hydramnios. The temperature was normal (and remained so throughout the patient's stay in hospital), but the pulse rate varied from 90 to 130.

Further investigations revealed mild anaemia (Hb, 75%) and negative Wassermann and Kahn reactions. The blood group was B (III), Rh-positive; the blood pressure was 115/85. The urine contained a trace of albumin but no casts or blood cells, and was sterile on culture. Radiological examination revealed a twin pregnancy, with the infants probably of no more than 28 weeks' maturity, one presenting by the vertex and the other by the breech.

The first paracentesis uteri was performed on the day after admission, when 4 pints 16 oz. (2.73 litres) of clear liquor amnii was released. Subsequently the patient felt much more comfortable, with the pulse rate stationary at 92-96. A week later the procedure was repeated and 3 pints 2 oz. (1.76 litres) of liquor