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Treatment of peripheral vascular diseases, in particular of ulcerative forms with Solcoseryl

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**TREATMENT OF PERIPHERAL VASCULAR DISEASES,
IN PARTICULAR OF ULCERATIVE FORMS
WITH SOLCOSERYL***

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Due to the constant increase of peripheral disease the physician is always more frequently obliged to diagnose and treat disorders of peripheral blood circulation in the limbs. In a mixed group of out-patients having disorders of the peripheral blood circulation 15 % of the diseases concern the arterial vessels; 70 % of the affections are purely venous, while 10 % concern the arterial as well as the venous vessels (Kappert). The following distinctions fall under the general notion of peripheral disease in its widest sense :

I Affections of Arteries and Arterioles

1. Organic forms (Figs. 1 and 2)

a) Arterial occlusive diseases: Arteriosclerosis obliterans, arterial embolism arterial thrombosis, thromboangiitis obliterans, arteritis of different origins, diabetic angiopathy and gangrene, aortic arch syndrome, disorders due to lesions, disorders due to cold or humidity

b) Non-occlusive organic arteriopathies: Arterial aneurysm, arteriovenous fistula

2. Functional Forms

a) With tendency towards vasoconstriction: Digitus mortuus Raynaud's disease and Raynaud's phenomenon, acrocyanosis, arterial pseudoembolism, crural erythrocyanosis, lividity, neurovascular shoulder-girdle syndrome, brachialgia statica paresthetica

b) With tendency towards vasodilation: Erythromelalgia

II Venopathies: Varicosis, thrombophlebitis and phlebothrombosis, phlegmasia cerulea dolens, migrating phlebitis, postphlebotic and post-thrombotic syndromes, venous varicose ulcer

III Capillary Disease: Vascular purpura

IV Disease of the Lymphatic Vessels: Lymphangiitis, lymphedema

V Tumors and Dysplasia of the Blood Vessels: Hemangioma, etc.,

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benign as well as malignant forms.

Ulcerative and/or necrotic lesions of a series of the above-mentioned forms of peripheral circulatory disease are particularly crucial. These may be due to disorders of the arterial as well as the venous peripheral blood circulation, and are the manifestations of the metabolic catastrophe taking place in the dependant tissues.

There are countless methods for their treatment, which indicates that the therapeutic results are not satisfactory.

In the last few years numerous well-known authors have reported on the use of a deproteinized calf-blood extract in the treatment of disorders of the peripheral blood circulation, more particularly of the ulcerations that accompany them.

This deproteinized calf-blood extract is marketed under the brand name Solcoseryl. The biological action of Solcoseryl consists in improving the utilization of oxygen and thereby increasing the metabolism of animal and vegetable tissues about three-fold in relation to the controlled measurement in Warburg's microrespirometer (JAEGER, SZIRMAI).

Investigations made by JAEGER and MITTENZWEI on isolated liver mitochondria revealed that the oxygen consumption of tissues incubated with Solcoseryl or of mitochondria treated with Solcoseryl is higher than that of the controls, it being essential that the P/O quotient remains unchanged, i. e. that the increase in respiration runs parallel with an increase in phosphates rich in energy. This is not a decoupling of oxidative phosphorylation, nor an isolated substrate effect, as that which can be observed when certain substrates are added. The increase in respiration inside the tissues, which the above-mentioned authors observed, lies markedly above the values that can be obtained with the known substrates.

The results of numerous animal experiments and clinical trials in hypoxydotic conditions correspond with those obtained by the above-mentioned authors showing that processes in which Solcoseryl intervenes are favoured by a high requirement of energy (ion exchange, healing of wounds, regeneration of tissues) and that the tolerance of noxae and oxygen deficiency is considerably increased. Thus WICKINGEN was able to prove on a total of sixty-six swines with sacrifice of identical form and size that Solcoseryl significantly accelerated the healing process in comparison to that of the untreated controls and without producing any retraction of the borders of the wounds. This replacement of substance in cases of fairly deep loss of tissue was also observed by other authors (COUCOURDE and SCHIFINO). Granulation and epithelialization of the wounds are accelerated, retraction of the borders is insignificant, and scarcely any cicatricial contraction is noted. Heavily secreting and suppurating wounds clean rapidly, and blood

circulation is improved both in the affected area and in the trophically disturbed surrounding area. Granules appear in the depth of the wound and they converge forming a granular mass progressing from the center towards the borders, thus making up for the loss of substance. Strips of epithelium project from the borders towards the center. The epithelialization occurs along with and ahead of the replacement of the substance. In no instance did there appear any wild over-growing granulation. It is most impressive that improvement takes place after only a few days' treatment and subjective discomforts such as pain, paresthesia, or cold limbs gradually disappear.

Complete healing takes comparatively little time, if one considers the usual duration and habitual resistance to therapeutics of such lesions. The vascularization of the skin covering these wounds is usually good, the skin is soft and pink with smooth elastic scars. Practically no cicatricial hypertrophy has ever been observed. It is absolutely essential to persist in the treatment with Solcoseryl even if the results do not seem encouraging at first.

In cases of gangrene in which amputation is contemplated, an intensive treatment with Solcoseryl can frequently ensure a partial amputation only. Demarcation of the necroses allows one to distinguish between irreversibly lost tissue and repairable lesions. In diabetes it is, of course, necessary to control the basic illness.

The following general lines should be taken into account for the treatment of all severe cases: 1. In disorders of arterial blood circulation intraarterial infusions of 1 to 5 ampules of Solcoseryl with glucose added (for diabetics with sorbitol) should be given daily. 2. In disorders of the venous blood circulation treatment should consist of 1 to 2 ampules daily in intramuscular or intravenous injections. 3. In disorders of arterial and venous blood circulation the physician should choose the method which proves to be most successful; but in any case it is advisable to combine parenteral therapy with topical applications of 5% Solcoseryl ointment or 20% Solcoseryl jelly. It is recommended to cover heavily secreting, suppurating and necrotic ulcers daily with a layer of Solcoseryl jelly of the thickness of a knife blade, until the ulcer is clean, necroses have fallen off, and the secretion has subsided. The treatment should be continued with ointment applied to the wound on cloth until healing is complete. At the same time the parenteral treatment should be reduced to an appropriate maintenance dose of 1 to 2 ampules three times a week.

In extremely severe cases, particularly after amputations or in very extended and deep ulcers with scarce healing tendency, daily spraying of the lesions with 1 to 2 ampules of Solcoseryl or local injections of Solcoseryl into the border of the lesion or in the healthy area immediately surrounding the same, have proved useful.

In the above described manner numerous clinicians have obtained healing of more than 80% of trophic lesions which had resisted treatment for over 20 years. These lesions were due to disorders of blood circulation of the most varied origin, even of mal perforans leprosum (SZIRMAI, MANCOSU, UGO, ERBA and CASATI, GORI-SAVELLINI and MELONI, ERBA, KAPPERT, POHL, AZAM, STRATMANN, MEHREZ, HAMMAN and SHAFIK, MEYTHALER, ELL and DERLATZ, WOLFRAM, WYSS and BASTI).

OWN OBSERVATIONS

I first began using Solcoseryl in 1955 and 1956 in "Arpád" Hospital in Budapest, and first reported on the results, especially for the treatment of crural ulcers, in 1959 (Table 1, 1955~1966). As I had used most known methods in

Table 1 Own Observations (1955~1966)

| Diagnosis | Number of cases | Results | | |
|--|-----------------|---------|--------|-------------------|
| | | -good | middle | no change |
| I Affections of arteries and arterioles | | | | |
| 1. Organic forms | | | | |
| a) Arterial occlusive disease | 150 | 100 | 30 | 20 (severe cases) |
| b) Non occlusive organic arteriopathies | 190 | 160 | 28 | 2 |
| 2. Functional forms | | | | |
| a) with tendency towards vasoconstriction | 96 | 90 | 5 | 1 |
| b) with tendency towards vasodilatation | 52 | 38 | 10 | 2 |
| II Venopathies | 320 | 270 | 36 | 14 |
| III Capillary disease | 146 | 120 | 20 | 6 |
| IV Disease of the lymphatic vessels | 46 | 38 | 5 | 3 |
| V Tumours and dysplasia of the blood vessels | 34 | 30 | 2 | 2 |
| VI Radiation reaction | 140 | 128 | 4 | 8 |
| VII Ulcus ventriculi et duodeni | 130 | 97 | 20 | 13 |

this field for about eighteen years, I can affirm that I have obtained very satisfactory results with Solcoseryl in a considerable number of cases. From the outset I recorded blood circulation and various other factors in all cases treated with Solcoseryl not only with the methods known at the time but also with an as yet little known apparatus which I have developed, viz. the myotonometer (Fig. 1-a, b), the angiomyograph, and the mechanical myograph. My apparatus, in particular the angiomyograph, records capillary functions, through the modifications of muscular volume, that the oscillometer does not register. Thus it is possible to control with the angiomyograph acute and chronic activity tests of medicaments on arteries, veins, muscles, tissues, edema, innervations, *ect.*

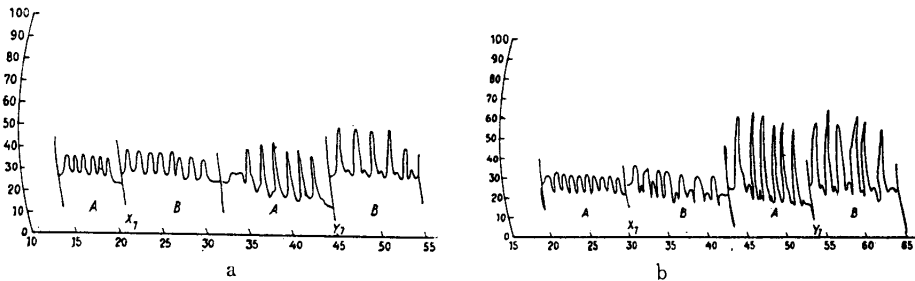


Fig. 1-a The angiomyogram of a crural ulcer which was treated with Solcoseryl. X: leg, Y : thigh, A: passive movement, B: active movement.

Fig. 1-b Is an angiomyogram of the same patient. The amplitude of this angiomyogram is much wider, which shows that improvement of the ulcer was accompanied by the improvement of blood circulation.

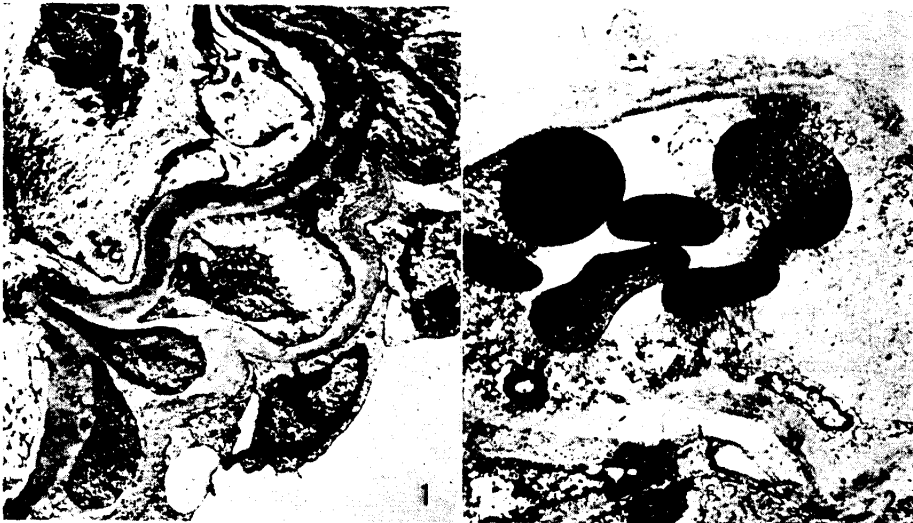


Fig. 2-1 This electron micrograph of a human meningeal arteriole from a patient with hypertension shows a thickened basement membrane (hyalinosis of light microscopy) $\times 6,000$

Fig. 2-2 This electron micrograph shows the intimal coat with an atheromatous haemorrhagic plaque in an artery of the human brain. Seven red blood cells lie in a cleft within the thickened basement membrane. A fibrinous clot surrounds the red blood cells. $\times 6,000$

I frequently observed that pain subsided when the treatment with Solcoseryl was successful. This can be explained by my "oxygen insufficiency theory" (=OIT) according to which every pain is due to a state of hypoxemia or anoxemia, in which cell combustion takes place only in part, and the half-burnt cellulose irritates the nerve endings. This is a chemical process, like that taking place in an oven, in which insufficient ventilation causes lack of oxygen supply. The so-called oxygen insufficiency can be favourably influenced by an improved blood circulation, i. e. an improved oxygen supply. (My so-called ГРОПС-theory

=general therapy of improved oxygenation of the peripheral circulation). Thereby every pathological condition can be favourably influenced and every pain (except in cancer) calmed without anesthetics.

From the above it can be inferred that every pain and every pathological condition in connection with disorders of the blood circulation, which indirectly affect various organs, can be favourably influenced and possibly healed with Solcoseryl (Table 1).

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REFERENCES

1. JAEGER, K. H. and MITTENZWEI, H.: Die Erzeugung einer Splenomegalie bei Kälbern. *Klin. Wschr.* 36, 441, 1958
2. WICKINGEN, H.: Über die Wirkung eines Blutextraktes auf die Wundheilung. *Wien. med. Wschr.* 110, 90, 1960
3. AZAM, SH.: Tropic ulceration of foot in leprosy and the use of an organ extract of animal blood. *The Healer* (Pakistan) 1, 12~16, 1962
4. COUCOURDE, F. and SCHIFINO, A.: L'impiego di un nuovo farmaco nella cura delle radiodermiti, *Minerva Radiologica fisioterapica e Radiobiologica* 1964
5. ERBA, G.: Su un raro caso di necrosi simmetrica delle estremità distali. - Trattamento con un nuovo derivato di sangue deproteinizzato. *Gazz. med. ital.* 119, 281~282, 1960
6. ERBA, G. and CASATI, C.: Sull'impiego di un nuovo farmaco nella terapia delle ulcere gastroduodenali e varicose. *Res Medicae* (Torino) 1, 34~48, 1959
7. GORI-SAVELLINI, D. and MELONI, N.: Considerazioni sulle proprietà cicatrizzanti di un estratto deproteinizzato di sangue (Solcoseryl). *Dermatologia* (Napoli) 11, 59~62, 1960
8. KAPPERT, H.: Person. Commun. 28 Oct. 1965
9. MANCOSU, A.: Sull'azione cicatrizzante di un nuovo preparato. *Giorn. ital. Derm.* 100, 92~103, 1959 ref.; *Derm. Wschr.* 142, 919, 1960
10. MEHREZ, I., HAMMAM, A. S. and SHAFIK, A.: Modern Surgery in the Treatment of the Diabetic Foot. *Kasr-El-Aini Journ. Surgery* (Cairo) 4, 137~144, 1963
11. MEYTHALER, F. ELL, O. and DERLATH, S.: Erfahrungen mit "Actihaemyl" bei der Behandlung peripherer arterieller Durchblutungsstörungen, *Münch. med. Wschr.* 105, 1945~1947 and 1956~1957, 1963
12. POHL, W. H.: Über die Behandlung von Strahlenschäden der Haut mit Solcoseryl. *Strahlentherapie* 117, 279~287, 1962
13. STRATMANN, F. W.: Behandlung der diabetischen Angiopathie. *Aerztl. Praxis.* 11, 51~53, 1960
14. *SZIRMAI, E.: Meine Erfahrungen mit der Solcoseryl (NKB)-Behandlung der ulcera ventri-

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- culi et duodeni und desulcus cruirs. *Ztschr. ges. inn. Med.* 14, 769~772, 1959
15. UGO, A.: Recenti esperienze in tema di terapia dell'ulcus cruris flebopatico. *Folia Angiol.* 6, 316~321, 1959
 16. WYSS, J. L. and BASTI, H.: Contribution á l'expérimentation du Solcoseryl dans le traitement des escarres et des gangrènes des membres. *Praxis* 53, 1955~1901, 1964
 17. WOLFRAM, ST.: Moderne Therapie bei Hautkrankheiten. *Monatsk. ärztl. Fortbild.* 2, 520~524, 1959