CHRISTINE (G.M.)

PERMANGANATE OF POTASSIUM IN THE TREATMENT OF LEG AND OTHER ULCERS.

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Philadelphia, Pa.

Read before the Homœopathic Medical Society Germantown.

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PERMANGANATE OF POTASSIUM IN THE TREATMENT OF LEG AND OTHER ULCERS.*

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Philadelphia, Pa.

THE treatment of ulcers of the leg, and particularly of all septic ulcers of pronounced sluggish type, is frequently so unsatisfactory, that it will probably not be amiss for me to present a contribution on the subject.

A few years ago a man presented himself at the Harper Hospital Dispensary of this city with varicose leg ulcers of such septic character, that the air of the room soon became so befouled I sought for a deodorant to apply to the gangrenous sloughs. Among the standard preparations of the dispensary was one of a saturated solution of *permanganate of potassium*, from which irrigating solutions were made. Not waiting to dilute the preparation I poured some of it on the ulcers, with the result that the odor was quickly subdued. This done, I placed over the ulcers a compress and bandage and sent the patient home to return the following day. On his return, there was a decided change for the better in the character of the ulcers. After clearing away the sloughs with scissors and a Volkman spoon, I became impressed with the belief that another application of the *permanganate* solution would prove beneficial. This time I not only poured it on, but rubbed it in with pledgets of cotton held in dressing forceps, over which I dusted a powder of *iodoform* one part and *boracic acid* nine parts. Over this was put a layer of gauze, a pad of oakum and tight bandage. The man got well so speedily under this treatment applied at short intervals, that I was led to believe that the *permanganate* was the special factor in the improvement. After this, every sluggish leg ulcer was put under this routine treatment with uniformly brilliant results.

From thus treating varicose leg ulcers, I passed to the treatment by the same methods, of ulcers other than of the varicose variety, and situated in other localties than the leg. The *permanganate* proved to be of great service, and was soon found to occupy a field of usefulness apparently all its own.

I have instituted the use of the *permanganate* in the Surgical Dispensary of St. Luke's Hospital of this city, and have been able

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to study its action and to determine fairly well the indications for its use, and to note its limitations.

The employment of *potassium permanganate* in the treatment of ulcers and septic wounds is no new thing, every surgeon being familiar with it as an excellent antiseptic wash and irrigant. It is even probable that it has been and is being used in strong solution in the manner recommended in this paper; but the books on surgery give it no notice except in practically weak dilution as a wash.

As a powder over fresh wounds, I presume nothing has yet replaced *iodoform*; and its efficacy even in septic wounds or on septic surfaces, is much believed in. But there are many objections to the use of *iodoform*, two being uppermost—its odor and its powers of intoxication—which faults so far limit its sphere of action as to cause its use to be abandoned by many surgeons. Furthermore, *iodoform* is not a germicide and is not stimulating—two important qualities that it is necessary any substance of great use in the treatment of sluggish septic ulcers shall be possessed of.

Iodoform "sterilizes the soil in which bacteria might develop, and neutralizes or destroys bacterial products." It is this power which gives to *iodoform* its value. *Aristol* and other antiseptic powders have been pitted against *iodoform* as having equal or superior qualities, but it is doubtful if any one of them has succeeded in excelling *iodoform*, except in not possessing intoxicating or poisonous properties, and in not affecting persons possessed of an idiosyncrasy.

But while *iodoform* is designed to sterilize the soil of a wound not already pyogenic, and to destroy pyogenic products in a wound already septic, in the treatment of septic ulcers and wounds these two qualities are insufficient. The soil is not to be made sterile until the bacteria have been destroyed, and *iodoform* has feeble if any powers in this direction. Its power is protective—not destructive. Hence, we must seek for another agent;—one that possesses germicidal powers in conjunction with other properties essential to the purpose of a local septic-ulcer medicament. Among the long list of such substances, I select *permanganate of potassium* as the most valuable because of its germicidal and stimulating properties in addition to its possession of sterilizing powers, of ability equally with *iodoform* to destroy bacterial products, and of freedom from an intoxicating tendency.

In the effort to obtain a germicidal substance that is non-poisonous and non-irritating, surgeons have done considerable experimenting. *Hydrogen peroxide* lately occupied a prominent place in this

respect, and is very much used. But it is probable that while *hydrogen peroxide* is of value, its usefulness is restricted.

Its work is too superficial and frequently fails most woefully in its intended mission. The effervescence which it produces is, in my estimation, apt to be harmful in that it pushes the bacteria and their products further into the tissues, thus augmenting the circle of their activity. This is a theory, but it seems plausible. I would not discard *hydrogen peroxide*, but I think I comprehend its limitations, and I employ it according to my understanding of its action.

Dry antiseptic powders placed on an ulcer, tend to crust it over, and the pyogenic discharges will frequently be found beneath the crust or scab, often tending to penetrate deeper and spread wider. Hence, ulcers so treated, frequently assume an aggravated form, need very careful watching, and are slow to heal.

In typical leg ulcers, I do not believe there are any dusting powders that are so useful as to warrant universal confidence. Even if valuable, they all lack in one or more essentials, and the cure, under their use, is slow and tantalizing.

I have given *permanganate of potassium*, in strong solution an extended trial not only for the purpose of fixing its value but of determining its limitations, and I am now prepared to assert as to its efficacy and to state, in general terms at least, its indications.

The efficacy of *permanganate of potassium* resides, as already mentioned, in the two great essentials of germicidal and stimulating properties. Warren has well stated that an ulcer, which he very properly classes as "one of the infective inflammations," is a solution in "continuity of the skin or the mucous membrane which shows no tendency to heal. An ulcer has been defined as molecular death to the part it owes its existence—in fact, to an excess in action of the retrograde changes over those of repair." He further states that "the process is closely allied to that known as necrosis or gangrene."

These definitions furnish the groundwork for treatment, and any departure from the indications they point out, must result in a lessened value to the treatment instituted.

In the first place, the treatment of an infective inflammation demands a destruction of the infective agent. *Permanganate of potassium* in strong solution, does this, probably by its oxidizing properties, without in any manner robbing the normal neighboring tissue of any of its vitality. *Hydrogen peroxide* has been accused of disturbing the vitality of contiguous tissues, and I have more than a few times witnessed evidences of this. The *permanganate*, properly

used, has none of this tendency, and confines its destructive or inhibiting influence to the causative pathological processes of the part. This being assumed to be true, the *permanganate* is not only an effective but also a safe agent.

In the second place, the ulceration being a retrograde movement of the molecular processes in the part, in order to obtain a cure, life must be imparted to the tissues, and the retrograde processes be made to change to those of progression or repair. Therefore, we need not only a germicide to kill the bacteria and remove the infection, but also a stimulant which shall check the retrogression and impart vitality to the forces of repair. In a strong solution of *permanganate of potassium*, we have this stimulating property to an extent not harmlessly possessed by any other medicament.

In the third place, the treatment of ulcers needs the property of inhibiting the tendency to a further bacterial action. The *permanganate* provides this, though possibly not so fully as do some other agents, but sufficiently so to be, in my opinion, worthy of confidence.

The deodorizing property of *permanganate of potassium* is also important, and in the treatment of many forms of ulcers, is another factor in its favor. Large varicose leg ulcers accompanied with the usual septic and œdematous features, are the best types of ulcers for the exemplification of the powers of treatment by *permanganate of potassium.*

I will assume for clinical purposes that such a case is before me, and will proceed to outline its treatment according to the *permanganate* method.

The patient, a woman, comes with both varicosed legs ulcerated at the usual site, the ankles. They have been troubling the patient for three or four years, and several forms of treatment have been tried, sometimes with relief, but more often with aggravation. The legs and feet are œdematous, and surrounding the ulcers are large patches of dermatitis, the result of excoriating inflammatory discharges. The veins are greatly varicosed, the ulcers being the result of the varicosity. The ulcers are gangrenous, and the air of the room is soon loaded with the foul odor. The ulcers are large, two on one ankle and three on the other. The bases of the ulcers are greenish black. The legs are sore, and walking or standing is almost impossible, owing to the venous and œdematous swelling. Life has become burdensome to the patient, and she has applied to us for relief, despairing, however, that she will find it.

At the outset of the treatment ~~the~~ ulcers of this or any other type, a green soap and water cleaning should be given, and we do this as thoroughly as possible, after which we dry the parts with a towel. The odor of the ulcers is so foul that we quickly get rid of as much of the loose necrosed tissue with scissors and forceps or with a Volkman spoon, as the patient permits, securing anæsthesia if necessary with *ethyl chloride* spray. This cureting, if done completely, need never be repeated.

Irrigation will not again be used until the ulcers are well, water being to leg ulcers what it is to eczema, an irritant. Sometimes, however, a cleansing with bichloride solution is neccssary.

Now having gotten rid of the necrosed tissue I employ a saturated solution of the *permanganate of potassium*. Pouring some in a small glass I saturate in it a ball of absorbent cotton held in forceps, which I now apply to the ulcers, leaving no part untouched, including the edges in the application, but avoiding the eczematous skin. I repeat this until the ulcers are black and take up no more of the solution, and I now rub the cotton into the ulcers, to be sure that the application is thorough.

This application is painful, but if done deftly, holding the leg firmly and promising the patient that it will pain for only one or two minutes, few patients will complain. I now place over the ulcers sterile gauze compresses, encircling the limb and including all of the eczematous skin. The compresses should be four or six thicknesses, and applied evenly. I do not advise any powder over the ulcers, but if the eczema is scaly, *diachylon ointment* may be thinly spread on the gauze, and placed over the affected area. This will moisten the skin and facilitate repair. Ordinarily, the eczema improves under the simple application of a plain dressing.

I have now treated the ulcers and partly dressed them, and now proceed to a very important part of the treatment, namely, the bandages. I have special views respecting the bandaging of leg ulcers. I never use reverses, believing they tend to create ridges in the skin, and to impede ~~surface~~, venous and lymphatic circulation. I use two bandages, one about four inches and the other about six inches wide.

With the patient seated on the top of a table, I extend the leg and begin with the four-inch bandage to fasten the gauze dressing in place by three circular turns. The tension I employ, though considerable, is not enough to constrict the ankle too tightly, but sufficient to give uniform pressure over the ulcers. The bandage is now swept down over the instep to the base of the toes, made to en-

circle the foot, passing up over the instep, back to the foot above the heel, now around over the instep, now back over the heel, then over the instep again, making one or two tight turns, and then covering the whole of the calf up to the knee-joint by figure of eight turns, not once using reverses. The whole of the leg below the knee has now been snugly covered to the toes by the bandage, and if the bandage is rightly applied no part is unduly constricted, every portion is covered, and the leg is encased in a bandage giving considerable but even and comfortable pressure. I now use the second or broad bandage, making the first turns around the calf, sweeping down around the ankle, then covering all of the first bandage from the ankle up to the knee, by figure of eight turns, without reverses. This bandage I use principally to keep the first in place. It also aids in securing even pressure.

The end of the bandage is fixed by a safety pin, and I now treat the other leg as I treated the first. The patient is told to put on her shoes and go about her work, to return in two days. When she comes back the day after to-morrow, the leg will be found better and the ulcers will again be treated by the *permanganate of potassium* solution, and the necessary dressings applied. The treatment should be every two days. Soon the edges of the ulcers will shrink, the œdema of the feet and legs will begin to subside, the dermatitis will improve, and the ulcers will fill up with granulation tissue. The *permanganate* can now be stopped, and the *sub-iodide of bismuth* powdered freely over the ulcers over which a dry gauze dressing can be applied with the usual bandage. The *permanganate*, however, is to be continued until all required stimulation is secured.

This woman has suffered intensely for several months, because her ulcers have not been given proper treatment or did not have proper care on her part, but I will assure her that if she will follow my directions, I will cure her legs of the ulcers, and will make life once more worth the living.

I have gone over this case as I would in a clinic, in order the better to illustrate the treatment. The method is very simple and clean, and is not obnoxious in any sense.

Internal medication, when indicated, must not be forgotten; and the hygiene of the patient must be given due attention.

The bandaging is, of course, an important part in the treatment; but the prime factors are the germicidal and stimulating effects of the *permanganate*. This I have proven, I believe, satisfactorily to myself by substitution of other substances for the *permanganate* and noting the results, which have always been in favor of the latter.

From the treatment of leg ulcers by the *permanganate*, I have naturally passed to the treatment of other infective and sluggish ulcers or non-granulating wounds; and I have met with the same satisfactory results as above noted. It borders on the marvellous to see how, in old sluggish ulcers that seem to defy treatment, a saturated solution of *permanganate of potassium*, will, when applied freely and proper dressings used, cause granulating tissue to spring up and soon fill in the cavities. I know of nothing that in this respect is its equal. The limitations of the treatment are to be noted where granulations assume a superabundancy and need trimming down, as it were ; the *sub-iodide of bismuth* and *balsam of peru* treatment, is now appropriate,—the powder being dusted on the ulcer or wound, and a gauze compress, saturated with *balsam of peru* in *castor oil* (1 to 10), with a protective of paraffine paper over it, and bandaged to the part. This dressing is repeated about every two days until cure takes place.

I have lately cured syphilitic ulcers which defied every other method, by the *permanganate* solution, *sub-iodide of bismuth* and *balsam* treatment, of course, conjoined with the proper internal medication.

However partial I may be to the value of this drug in ulcerated tissues, I am not so infatuated with it as not to be willing to notice its defects, if it has any. I have watched carefully for defects, and thus far have failed to find any. Its limitations are, as I have stated, defined by the no longer need for stimulation. If persisted in after this point has been reached, harm may ensue by the over production of granulating tissue; but intelligent comprehension of the indications will avert this issue.

Discussion.

Dr. W. G. Steele said that the paper interested him very much, as he had experienced many of the difficulties referred to by the author in the treatment of ulcers. He had tried all the various methods generally employed, and often found that what would cure in one instance would fail in another. He had found a ten per cent. solution of *phosphoric acid* of considerable service. A solution of *tartaric acid* locally applied, had likewise been of value. A solution of *bromine*, 1-200, had been frequently used by him and others with good result. *Bovinine* had its champions, and much of value could be said of it. *Electrozone* was a deodorizer of marked efficiency, and seemed to have the power to encourage healing. Finely powdered *acetanilid* dusted over the ulcer has given him good results; and so has a powder of *boracic acid* and *acetanilid*. Dr. Steele believed that in *permanganate of potassium* he would have another friend, and he

would be pleased to give it a trial according to the directions laid down by Dr. Christine.

Dr. J. Landreth Thompson was very much interested in the reading of the paper. *Glycerine* had been employed by him as the *permanganate* had been used by Dr. Christine with about the same result. Like the *permanganate*, *glycerine* appeared to carry the granulating process to a certain point beyond which it did no good and often harm. The *balsam of peru* in four per cent. mixture in *castor oil*, was a valuable adjuvant. He applied it on four or five thicknesses of gauze, and found, when it was removed in a day or so, that the ulcer had quite a clean look, the *balsam* favoring the absorption of the discharges, thus preventing their irritation of the ulcer. *Aristol* was valuable as a dusting powder, particularly after other applications had gotten the ulcer fairly well filled up, and needed only a skinning over. *Diachylon ointment* thinly spread over the ulcer and neighboring tissue, kept the tissues clean and soft, thus favoring circulation. *Formalin-gelatine*, a substance lately brought to his attention, was giving him good results in favoring the filling up of sluggish ulcers. Dr. Thompson did not agree with the author of the paper in his teaching not to use reverses on leg bandages. He used them and did not believe bandages could be successfully retained on legs without reverses. Reverses favored even compression, and made the bandage firm. He sometimes used starch bandages, which he employed mostly when the discharges had fairly well stopped, so that they could be retained for several days.

Dr. Willard Reading referred to simply *cerate* combined with a small amount of *carbolic acid* as having done him good service in the treatment of leg and other sluggish ulcers. He had used the *permanganate* in the form of powder or crystal. Powdered *phenacetine* has been used by him in the manner *acetanilid* had been used by others.

Dr. Charles Mohr deprecated the employment of local agencies without seeking to cure by the administration of the indicated homœopathic remedy. It was a failing that surgeons had in not relying more on internal medication and less on local treatment. He had treated very many ulcers of the type referred to to-night with excellent results, using the precaution, of course, to keep the parts clean by the use of proper antiseptics, and supporting the parts when possible by a bandage. Acute ulcers got well without local treatment, and so will many chronic ulcers if they are kept clean and internal treatment alone relied on. *Pulsatilla* was a standard remedy with Dr. Mohr for old leg ulcers, and he had witnessed marvellous results following its employment.

Dr. Shoemaker employs *carbo veg.* as a dusting powder, and could certify to its efficiency when so used.

Dr. J. R. Mansfield placed great confidence in *aristol*, *nuclein* and *protonuclein* as dusting powders.

Dr. J. R. Closson suggested the employment of *papoid*.

DR. MALIN, the President of the Society, commended the results obtained by Dr. Christine in his use of the *permanganate*.

DR. THEODORE GRAMM was very much interested in the *permanganate*. It had been a favorite study with him for many years. It had gained considerable repute under the teaching of Howard Kelly in preparing the hands for operation. *Permanganate of potassium* very freely gave up its oxygen in contact with decomposing tissue, and this was the secret of its value. *Oxalic acid* was used not alone for its cleansing the hands from the stain of the *permanganate*, but because it also gave up its oxygen and assisted the *permanganate* in altering putrefactive and other pathogenic changes. The dark color imparted to the skin by the frequent use of the *permanganate* was an evidence that its action had gone on as far as it could, and to this point it should always be pushed and then stopped.

Dr. CHRISTINE, in closing, opposed the employment of most powders, particularly *aristol*, because they, and *aristol* in particular, caused a caking over of the ulcer and the confinement of pus underneath, which if not speedily liberated would penetrate into adjoining tissue and enlarge the ulcer. He maintained the statement he made that reverses should not be used on leg bandages for ulcer, because, try as one might, they creased the skin and prevented proper venous and lymph return. It had even been recommended to use a single piece of bandage material cut to fit the leg and foot, and held in place, after snug application, by tapes. The theory of this is good, but the successful application is very doubtful. The principle to use as broad a bandage as possible and of firm material, to take in the whole leg and foot from the knee to the base of the toes, and without reverses, seemed to Dr. Christine to be an improvement on other plans. Dr. Christine had found the *permanganate* to have certain limitations, but they were easily explained. The power to stimulate possessed by the *permanganate* was transferred to that of irritation if the stimulation was carried beyond the point of necessity. Superabundant granulations were, therefore, to be carefully watched for and inhibited, by either stopping the *permanganate* or the employment of some other agent. He instanced several cases in which futile effort had been made to encourage granulation by other methods, the *permanganate* finally doing the work required. One was a case of exposed skull from which the periosteum had been denuded. The *permanganate* caused granulations to spring up around the wound and there was a provisionial periosteum with a rapid filling up of the wound space. In this case it had seemed hopeless to get nature to do the repair, and a plastic operation was about to be done, when the *permanganate* did the work. In another case, the *permanganate* caused granulations to spring up in an old operative wound for tubercular femur disease, that resisted every other effort; but the granulations were white and tended to degenerate. Subsequently the bone was found diseased, and the wound naturally refused to heal. But it was interesting to note the prompt response on the part of the wound to throw out granulations after the application of *permanganate*. Though in this

case, the granulations were useless, it gave the speaker's faith in the efficacy of the drug much encouragement.

Dr. Christine urged a fair trial of the *permanganate* in all septic wounds that show a proneness to sluggishness. Attention to details, however, are just as essential in this treatment as in any other surgical work. He believed the *permanganate* to be the best of all germicides for application to septic ulcers and wounds, and that the stimulating properties it possesses give it a value surgeons should avail themselves of more than they do.

It is to be remembered that in sensitive or urethristic ulcers, there w already stimulation enough, and the application of *permanganate* iould add to the irritation. Distinction must, therefore, be made setween a sluggish ulcer and one of the urethristic type, for if the *permanganate* is used in the latter, it will disappoint the user.

In all accidental wounds, particularly of the lacerated character, the application of the *permanganate* after the usual washing, adds a cleansing and stimulating element that has done him frequent good service. It is especially useful when these wounds show evidences of sloughing.

Dr. Christine stated that there was much more to be said about *permanganate of potassium* in ulcer and wound treatment, but the intended length of his remarks had already been exceeded.