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ORIGINAL ARTICLES.

THE LATEST METHODS OF TREATING CARCINOMA BY HYPODERMIC INJECTION.

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The partial success of Professor Coley's treatment of sarcoma by the injection of the toxins of erysipelas and of the bacillus prodigiosus has aroused interest, and induced surgeons both sides of the ocean to experiment with other articles.

One of these is the extract of *chelidonium majus*. This is the ancient semi-domestic remedy calledcelandine. It is an acrid irritant having such energy that applied to the skin it causes inflammation and blisters, and applied to warts is said to destroy them by acting like a caustic.

Dr. Denicenco of Russia (*Wratsch, St. Petersburg*) experimented with it first in epithelioma of the lip, and having produced cures (by sloughing) he was led to use it in inoperable cancers of various parts of the body. He gives it internally by the mouth, applies it on the surface, and injects it into the tumor itself. Probably the whole effect comes from the injections, but of that I am not certain. By the mouth he gives from one and a half up to five grams of the extract dissolved in peppermint water in twenty-four hours. On the ulcerated surfaces of the cancer he paints twice a day a mixture of two parts of the extract of *chelidonium* and one of glycerin. For injection into the substance of the tumor he prepares a solution of extr. of *chelidonium*, glycerin and water in equal parts, and adds half of 1 per cent. of chloroform to prevent decomposition. One ordinary hypodermic syringe full is injected daily. Denicenco says that it causes pain, a severe chill, and a high temperature lasting until the next day. This series of symptoms does not always follow. I know of at least one case of cancer of the rectum in which there was no pain, chills, nor fever, and yet the patient derived great benefit from the treatment.

Denicenco describes the local effect as follows: "On the first days of the treatment the tumor softens and seems to melt; in three to five days fistulas appear at the places of the punctures; around these fistulas the neoplasm seems to be dissolved; in fifteen to twenty days the tumor separates from the healthy tissues and is expelled" (i.e., it becomes gangrenous and sloughs out). "The enlarged lymphatic glands become normal." This latter statement is very important, if true, because it implies that the effect goes beyond the mere caustic destruction of the primary tumor, and cures the infected lymphatics, or in other words the glandular secondary tumors. If I understand him rightly, he does not claim that the secondary tumors are

sloughed out like the primary, but that they are changed in character and "become normal." This opinion needs confirmation. The author asserts that he examined all the primary tumors microscopically, and was sure of their malignant structure.

Dr. Hunt of Dixon, Ill., sent a patient to me for examination and opinion. I found a malignant tumor of the rectum surrounding the entire gut about 2½ inches above the anus, and causing a stricture which amounted to an almost total obstruction of the bowel. The growth was firmly adherent to the walls of the pelvis and evidently inoperable. On consultation we agreed that it was best to try the *chelidonium*. Dr. Hunt and Dr. Grim arranged to carry out the injections, using a mixture of equal parts of extr. *chelidonium*, alcohol and glycerin. After three weeks trial, there was no softening. They then increased the strength to nearly pure extract (Parke, Davis & Co.'s). The tumor now softened, and soon sloughed away so extensively as to completely relieve the obstruction of the intestine and the distress of the patient, and causing a decided improvement of his health as well as of his comfort. One pretty severe hemorrhage occurred during the sloughing, but it was not exhausting. The parts being internal, it is impossible to say whether the whole primary tumor is destroyed, nor whether the infected lymphatics have improved in their condition, as was claimed by Denicenco.

This is a new treatment, and needs further testing, but I incline to think it will be found valuable in certain cases which are now considered hopeless because inaccessible to operative measures.

INTERSTITIAL INJECTIONS OF ALCOHOL.

Hassel of Nordhausen, Prussia, claims remarkable effects and even cures by injecting a solution of alcohol having a strength of 30 to 50 per cent. He says there is some pain at the moment of injection, but great relief from the pain of the disease. In tumors of the breast, he does not inject the tumor itself, but the connective tissue under and around it are liberally infiltrated with the alcoholic fluid by means of a syringe with a long pipe. The tumor shrinks and in many cases seems permanently cured.

Hassel of Germany, says the same thing substantially (*Therap. Woch.*, Oct. 11 and 25, 1896). He puts in from 5 to 20 cubic centimeters at once. The injections are made twice a week at first, and later once in two or three weeks. In fifteen out of eighteen cases of carcinoma of the breast the growth "dwindled gradually away until in a year there was nothing left of it but the connective tissue stroma, and there has been no return." The pains disappear and the general health improves in a remarkable manner. In five cases of carcinoma of the cervix uteri similar success was obtained.

Dr. Edwin J. Kuh of Chicago, reports one case. He deviated from the plan of Hassel by using absolute

alcohol, instead of a dilution. The patient could only tolerate three minims at first on account of the pain, but later endured with difficulty 30 minims. Dr. Kuh thinks the diluted form might have been better. The tumor was a carcinoma seated in the naso-pharynx. The reduction in size began after the seventh injection, and was apparently cured after the twenty-fifth. After four months there was no sign of return. He put the fluid into the tumor itself.

I have recommended the alcohol injections in consultation in several cases; but there has not been time enough yet to judge of the permanency of the cure, nor of the effects on the infected lymphatic glands. At present I advise it only in inoperable cases.

Dr. Young of Bloomfield, Iowa, uses the pure alcohol and puts it into all parts of the tumor itself. He claims some cures.

Hué of France, injects a solution of arsenic and cocain at intervals of two or three days, and later at longer periods. He claims good results and some cures, with freedom from pain.

Alexandro and others have injected methyl blue, and report the pains relieved and the tumors made to shrink and disappear.

Dr. C. M. Fenn of California, reports the injection of saturated solution of citric acid. He says it brings "instant relief" and some cures.

This whole investigation is yet in a crude and unfinished state, but it will go on to more definite results. If some injection can be found which, while curing the primary tumor, will have such a controlling power over the inaccessible secondary ones, as is claimed for the chelidonium, it will be of immense value. If this power over the infected glands is not finally proven, it will still be of great importance in many individual cases to atrophy the primary tumor and to relieve the distressing pains.

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SURGICAL SHOCK.

Read before the Chicago Academy of Medicine April 9, 1897.

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The experiments on animals for inducing shock were reported before the AMERICAN MEDICAL ASSOCIATION, May, 1896. In these experiments the color changes in the abdominal viscera were noted, the blood pressure in both arteries and veins in the peripheral circulation as well as the central. I will give a brief résumé of some of these experiments.

Experiment No. 1 showed that after exposure of the stomach and intestines to draught of air from an open window, temperature 58, profound shock resulted. The gastric veins within half an hour were all congested. Respiration shallow; pulsations weak. The chloroform was pushed to the extreme; animals stopped breathing. Withdrawal of chloroform and artificial respiration did not excite respiratory movements. The intragastric resuscitator¹ was introduced into the stomach, and hot water 130 F. As soon as the water returned from the other side of the double tube, and more hot water introduced the animal began to breathe. In twenty minutes there was a remarkable change in the color of the stomach. Instead of the blue dull color it became a bright red. In forty minutes the surface of the body became warm. The mouth showed a bright red color, in place of the pale

livid hue. Pulsation became strong, showing increased arterial tension and the respirations became deep and uniform. This was repeated during the same period, and the second time the same phenomena were again presented. When the restoration of the circulation seemed assured, the abdominal wound was closed, leaving a permanent gastric fistula. The animal recovered and was exhibited in my lectures given at Jefferson Medical College, Philadelphia, February, 1896.

Experiment No. 2 was of a similar character. The pressure in the veins and the arteries was studied with a manometer to indicate the changes in blood pressure. During shock the veins and the viscera show increased pressure while the arteries a decrease. After the introduction of the intragastric resuscitator this condition is reversed.

Experiments 3 and 4 similar to 1 and 2.

Experiment 5 was a study of changes that occur by the observation of color of the viscera. The shades from the normal to profound shock, showing eight different stages; also standard changes of shades observed after the introduction of the intragastric resuscitator. Referring to the chart, No. 1 is the normal, No. 2 the first changes observed after shock, No. 3 and so forth up to 8. It is found that within three minutes after exposure shade No. 2 was observed, in eight minutes No. 3; ten minutes No. 4; fifteen minutes No. 5; half an hour No. 6. It required an hour and a half for No. 8 to appear. There was a marked difference in the shades of the intestine and the stomach; when the stomach showed shade No. 5 the intestines appeared shade No. 6 (after the introduction of the intragastric resuscitator). After thirty minutes the shade in the stomach showed No. 4, intestines showed No. 5. In forty-five minutes all the larger veins were apparently empty. In one hour the stomach showed shade No. 3, while intestines remained shade No. 4. (Exhibition of color chart.)

SHOCK BY THE INTRODUCTION OF TOXINS.

Experiment No. 5. Method. Stomach contents drawn off, from a patient suffering with dilatation of the stomach. One hundred cu. cm. injected into a dog weighing 15 kg. This is repeated in one hour. Evidence of shock observed. In one hour the surface was cold, the mouth and gums pale, and on opening the abdomen a deep injection of all the viscera was apparent. The animal was in shock. Introduction of the intragastric resuscitator, reduction of the shock is produced. The animal recovered. While a control under the circumstances carried out on a dog weighing 16½ kg. the animal died.

Experiment No. 7. Shock produced by operation on abdominal viscera. Long incision from xiphoid appendix to symphysis pubis. Operation for gastrostomy (Turck's valve operation). Operation for the Heincke-Mukilitz pyloplastic. Also Martell's operation for gastro-enterostomy. Within one hour the entire stomach and intestines showed a bluish color with all the veins congested. Respiration shallow; pulse 130; evidence of collapse. Hot water bag placed inside the stomach. Temperature of 125 raised to 135, in a moment there was a change in both the pulse and respiration, the high heat having an instantaneous reflex action. The color changes within two minutes. In fifteen minutes the veins grew smaller in size and the surface appeared more of a rosy color. Respirations not so shallow, pulse strong, show-

¹ For description of the instrument see Journal, Jan. 11, 1896, p. 79.