

9:40 a. m., the vessels of the neck were clamped off with Crile clamps.

9:48 a. m., the renal vessels were clamped.

10:20 a. m., circulation was reestablished through the kidney.

10:56 a. m., the last stitch was taken in the wound.

11:05 a. m., anesthesia was stopped.

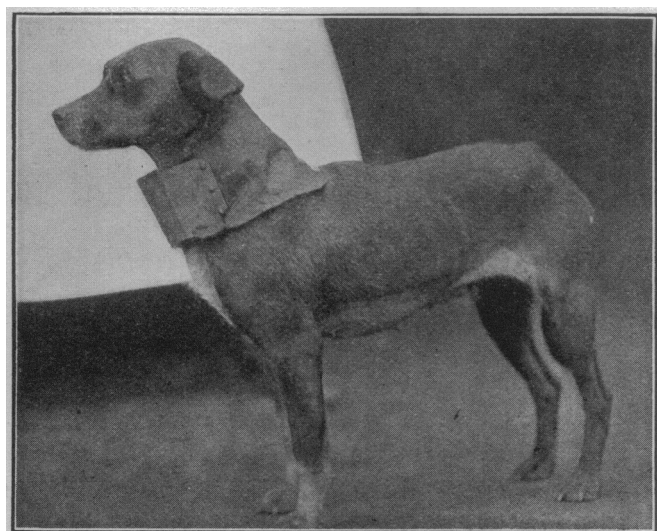


Fig. 5 (Dog B 976).—Twenty-four hours after right nephrectomy.

#### CONCLUSIONS

1. It is possible for a dog to remain alive and in good health more than four months after the transplantation of one kidney to the neck, even when the remaining kidney is removed two weeks after the transplantation.

2. After the transplantation of a kidney with its ureter, the ureter may be seen to move when contracting during excretion.

3. The ureter in a renal transplant may have the power to squirt the urine away from the animal by periodic contractions.

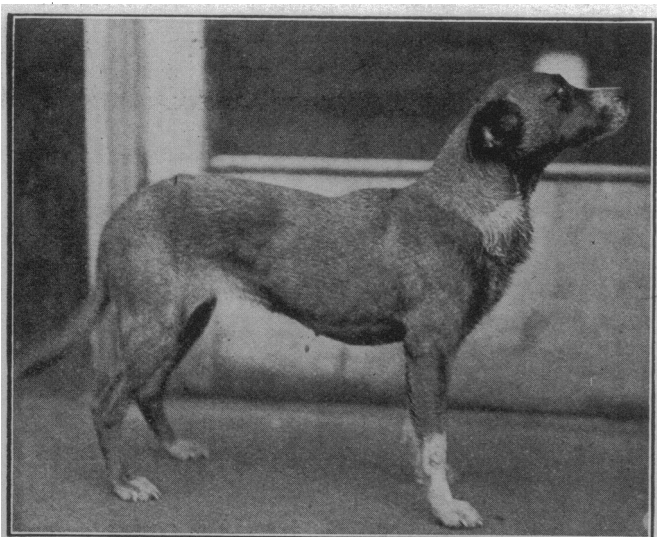


Fig. 6 (Dog B 976).—Three months and sixteen days after operation.

4. Phenolsulphonephthalein may return in four minutes from a transplanted kidney.

5. Many branches from the second cervical nerve may, in seventeen days, become intimately incorporated in the perirenal tissues of a cervical renal transplant.

6. The quantity of urine from a cervical renal transplant is markedly increased after the removal of the other kidney.

7. The neck is a favorable site for the observation of an experimentally transplanted kidney and its excretion.

#### ACTION OF EMETIN ON MALIGNANT TUMORS\*

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While there has been, up to the present time, no experimental confirmation of the theory that malignant tumors are of parasitic origin, there are still some observers, especially among clinicians, who hold the belief that the etiologic factor in neoplasia is a parasite, possibly amebic in origin.

This possibility suggested to me the testing of the effect of emetin (alkaloid) on malignant tumors, since this is considered a specific for amebic dysentery. Tests of the drug were made, therefore, in cases of human and animal carcinomas and of animal sarcomas. The results obtained in human beings seemed rather promising; but because of the many pitfalls in this special field of work, I considered it advisable to test the drug extensively on tumors of rats and mice before I drew definite conclusions. The experiments have shown that emetin has no effect on malignant tumors.

The reason for the publication of these observations is the fact that Mary Freeman<sup>1</sup> reported lately that she had used emetin locally in a case of skin cancer with seeming success. She states that the idea of using this drug in cases of cancer was suggested to her in a paper by Roehr<sup>2</sup> on the amebic origin of the disease.

Since it is highly probable that the use of emetin in cancer may suggest itself to others than Freeman and myself, it seems of some value to record my observations for future reference.

#### CLINICAL OBSERVATIONS

CASE 1.—M. S. was suffering from inoperable local recurrences, following a radical amputation of the breast for carcinoma. The treatment was begun in March, 1916. Injections were made into the tumors, 0.03 gm. of emetin being injected, under aseptic precautions, at each sitting. After the injections, each tumor increased to three times its previous size, softened and disappeared without discharge of pus. This case seemed very promising for a while. Then, at the lower angle of the wound, the patient developed a large recurrent growth which would not yield to treatment, and she died from internal metastases in July, 1917. The clinical diagnosis was confirmed by microscopic examination.

CASE 2.—S. M., nine months before, had undergone a radical amputation of the breast for cancer. When she came under my observation, she was complaining of swelling of the left arm and dyspnea. There were no external recurrences, nor any enlargement of the liver. After injections of emetin into both arms and legs had been given during a period of many months, the dyspnea disappeared entirely, and the swelling of the arm was considerably reduced. The condition improved so markedly that injections were stopped during the last six months. At the present time the patient seems to be in perfect health. The roentgen ray, however, shows a shadow in the lung. Too much stress cannot be

\* From Columbia University, George Crocker Special Research Fund, F. C. Wood, director.

1. Freeman, Mary: *South. Med. Jour.*, 1917, **10**, 246.

2. Roehr, C. G.: *South. Med. Jour.*, 1915, **8**, 855.

laid on the fact of the disappearance of the edema. It is evident that this case cannot be considered of any importance in an estimation of the value of emetin.

#### ANIMAL EXPERIMENTS

Carcinomas and sarcomas in rats and mice were treated by injections: (1) into the tumor; (2) subcutaneously, and (3) intravenously. The maximal dose of emetin that could be injected into the tumor or subcutaneously without injurious effect was found to be 0.00043 gm. Repeated injections into the tumor caused necrosis and scab formation. In the majority of cases, the scab fell off after a week, leaving an indurated area. Sometimes an area of alopecia was the only indication of the former site of the tumor. Microscopic examination of the necrotic area and the surrounding tissues showed practically a total absence of tumor cells. There was, however, a marked round-cell infiltration of the tumor-bearing area and of the surrounding tissues. The disappearance of the tumors is evidently based on the cell-destructive action of the emetin. This destruction is not limited to the tumor-bearing area, but extends to the surrounding tissues, thus preventing the proper nutrition of the tumors and establishing another factor for the disappearance of the growth.

By another series of experiments, it was shown that the mechanical factor, that is to say, the injection of the fluid into the tumor, does not play any rôle in the results obtained. Two sets of tumors, from two different series of six animals each, were injected with identical quantities of emetin and physiologic sodium chlorid solution, respectively. Whereas the tumors injected with emetin disappeared, the tumors injected with sodium chlorid solution grew at exactly the same rate as the controls.

Subcutaneous injections of emetin at some distance from the site of the tumors seemed to retard the growth. It is, however, a well-known fact that a considerable percentage of these transplanted tumors are either retarded in growth or completely disappear. After testing the drug in this fashion in a great many animals, I reached the conclusion that though the growth seems to be slightly retarded in a fairly large percentage, the retardation does not occur in a sufficiently large number of injected animals to warrant the supposition that the findings are due to a specific action of the emetin. It is rather to be assumed that they were accidental.

The most conclusive evidence concerning the action of emetin on carcinoma and sarcoma was derived from the intravenous injection of this drug into mice. The maximal dose was 0.00022 gm., and injections were repeated three times in the course of a week. The animals stood the injections very well. Tumors of animals thus treated did not differ in their growth from the tumors of the controls. Furthermore, microscopic examination of the tumors did not indicate any change, when compared with the controls.

#### CONCLUSIONS

1. Injection of emetin into carcinoma and sarcoma may cause a complete macroscopic disappearance of most of the tumors. This disappearance is not due to a specific action of emetin on the tumor cells. The action of the drug is purely caustic, similar, though in less degree, to the action of phenol (carbolic acid), zinc chlorid, etc.

2. Repeated intravenous injections of emetin do not affect the growth of carcinomas and sarcomas. This

proves conclusively that emetin has no specific effect on the growth of malignant tumors.

3. These observations do not strengthen the amebic theory of malignant tumors.

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## FAMILY PREVALENCE IN ANENCEPHALY

### REPORT OF CASE

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The occurrence of anencephalic monsters is not extremely rare. Few obstetricians that have attended many births have failed to observe one instance at least of this type of monstrosity. Ballantyne<sup>1</sup> in a series of 325 cases of monstrosity and fetal disease found forty-six anencephalics, an incidence of 14 per cent.

The case here reported is placed on record because of family prevalence, which in itself is a rare occurrence. In only two of Ballantyne's series had the mother previously given birth to an anencephalic fetus. This was noted in 1861 also by Lammert<sup>2</sup> and a little later by Carli,<sup>3</sup> who reported the birth of three anencephalic fetuses occurring in succession as in the case here related. Martin<sup>4</sup> has reported the history of six anencephalic births in the course of the reproductive life of one woman. This woman had also given birth to two normal infants and one other monstrosity.

The course of pregnancy that ends in the birth of this type of monstrosity is as a rule not markedly abnormal. The most frequent abnormality found is hydramnios with its attendant symptoms. As may be expected, the fetal heart is heard with difficulty if at all, and the fetal movements are not apt to be readily elicited on palpation, or strongly felt by the patient. If the pregnancy goes to term, the course of labor is apt to be prolonged mainly because the presenting part acts as an unsatisfactory dilator, and because of premature rupture of the membranes in the cases associated with hydramnios. Dystocia may arise from the breadth of the shoulders. Obviously, presentation by the breech gives a greater chance for spontaneous delivery. If artificial delivery is indicated with the head presenting, both Cragin<sup>5</sup> and Williams<sup>6</sup> advocate version with breech extraction.

The prognosis for the mother varies but little from that of a normal labor if the patient is in skilled hands. The fetus if born alive usually dies quickly, although Ross reported a case in which the child lived more than sixteen days.

### REPORT OF CASE

Mrs. C., aged 25, Russian Jewess, housewife, married five years, was seen in labor in the maternity wards of the Grace Hospital, New Haven, Conn., Oct. 24, 1917. This was her third pregnancy. The family history was negative; there was no history of monstrosities in either the patient's or her husband's family. Both were members of large, healthy families, and there was no blood relation. The previous history was negative except for the abnormal births. The

1. Ballantyne, J. W.: Antenatal Pathology and Hygiene, 1904, **1**, 332.

2. Lammert, G.: Arch. f. path. Anat., 1861, **22**, 230 (quoted by Ballantyne).

3. Carli: Bull. d. sc. med. di Bologna, 1863, Series 4, **19**, 30 (quoted by Ballantyne).

4. Martin, J.: Med. Exam. Philadelphia, 1840, n. s., **23** (quoted by Ballantyne).

5. Cragin, E. B.: Obstetrics, 1916, p. 703.

6. Williams, J. W.: Obstetrics, 1917, p. 861.