

16063 P

Cross Transfusion as a Means of Determining Toxic Factors in Blood from Burned Animals.

ERNEST GIRALDI, L. W. PETERSON, AND WARREN H. COLE.
(With the technical assistance of Mr. Everett Hoppe.)

From the Department of Surgery, University of Illinois College of Medicine, Chicago, Ill.

Although numerous methods of transfusion of blood from one animal to another have been utilized in an effort to test for toxic products, most of them fail to utilize principles which might prevent dilution of the toxins. When testing for a toxin possibly arising from an extremity removal of blood from a

vein in the neck or another extremity would obviously obtain blood in which any toxin would be greatly diluted. In efforts to test for a possible toxin in burned hind extremities of a dog, we resorted to cross transfusion in which 100 cc of blood per kg of body weight was removed

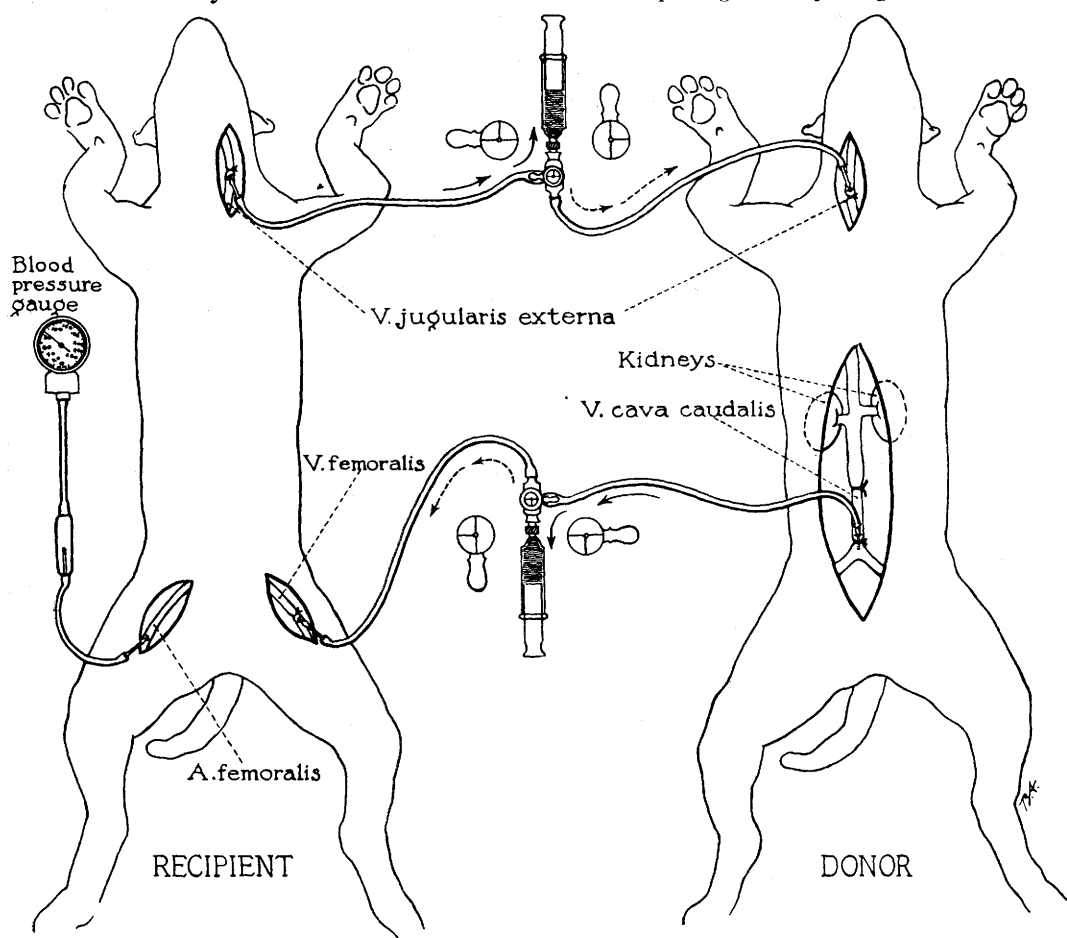


FIG. 1.

In our cross-transfusion experiments blood was removed from the vena cava of the animal (donor) burned on the lower extremities and distal torso; it was injected into the femoral vein of the normal animal (recipient). Blood was removed from the jugular vein of the normal animal and injected into the jugular vein of the burned animal.

TABLE I.
Mortality Rate, Blood Pressure, and Pulse Changes in Animals Receiving Blood from Normal Control Animals as Compared to Animals Receiving Blood from Burned Animals.

	Receiving blood from normal animals	Receiving blood from burned animals
Mortality rate	16.6%	27.7%
Avg drop in blood pressure	19.35 mm Hg	41.83 mm Hg
Avg rise in pulse rate	12.9 beats per min	14.8 beats per min
Total No. of experiments	30	18

over a 25-minute period from the distal vena cava of the burned animal (donor) and transfused into the jugular vein of the normal animal (recipient), as illustrated in Fig. 1. This obtained blood directly from the area of the burn which was produced by immersion of the distal portion of the animal for 30 seconds up to the third thoracic vertebra in vegetable oil heated to 120°C. All animals used in these experiments were anesthetized with 33 mg sodium pentobarbital per kg of body weight injected intraperitoneally; ether was used in a smaller series not reported herein. Blood from the 2 animals being cross-transfused was matched previously to rule out incompatibility. To facilitate transfusion, 5 mg heparin per kg of body weight was injected intravenously into the animals. The cross-transfusions were performed 48 to 96 hours after the burn, representing a time shortly before the expected death of the burned animal.

The mortality rate in 30 dogs receiving blood from the vena cava of normal animals was 16.6% compared to a rate of 27.7% in 18 dogs receiving blood from the vena cava of animals burned on the lower extremities and distal torso. (Table I) The average

drop in blood pressure of dogs receiving blood from normal dogs was 19 mm of mercury compared to a drop of 42 mm in dogs receiving blood from burned animals. There was very little difference in pulse rate in the 2 experiments. Statistical analysis of the data on blood pressure and mortality revealed the figures to be significant although the series is small.

Summary. In our experiments studying the effect of transfusion of blood from a burned animal (dog) to a normal animal we resorted to a method of cross transfusion which obtained blood from the vena cava (draining the burned area), and cross transfused large quantities (several hundred cc) to and from the normal and burned animal. The average drop in blood pressure of dogs receiving blood from normal dogs was 19 mm of mercury, compared to a drop of 42 mm in dogs receiving blood from burned animals in the same quantity and same speed of injection. The mortality rate in 30 dogs receiving blood from the vena cava of normal animals was 16.6% compared to a rate of 27.7% in 18 dogs receiving blood from the vena cava of animals burned on the lower extremities and distal torso.