5975

Effect of Intravenous Injections of Peritoneal Fluids Recovered from Dogs Dying of Experimental Intestinal Strangulations.*

HORACE G. SCOTT AND OWEN H. WANGENSTEEN.

From the Department of Surgery, University of Minnesota.

The lethal factors in strangulation obstruction are believed by most workers to be due to the absorption of toxins which are elaborated within the lumen of the strangulated loop or within its wall. If this be the case, any toxemia that may result must be secondary to the absorption of these toxins into the general system. This implies either absorption through the mesenteric lymphatics draining the loop, the mesenteric veins or else transperitoneally. However, there is little evidence that in a strangulation of any magnitude the veins or lymphatics from the strangulated loop are still capable of absorbing fluids or other products. The most recent investigators concede that if there is any absorption of toxic products it must be transperitoneally.[1, 2]

Methods. We therefore undertook to investigate the toxicity of the peritoneal fluids recovered from the abdomens of dogs dying from various types of intestinal strangulations. In order to be certain that these fluids reached the general circulation they were introduced directly into the leg veins of normal dogs. At the time the fluids were introduced, a carotid blood pressure tracing was being made so that the immediate effect on the pressure might be accurately observed. Amounts varying between 20 and 185 cc. were used. Fourteen experiments were carried out on 13 different dogs. There were no immediate or delayed effects in 10 of the animals. In these 10 instances the peritoneal fluid had been obtained from animals that had died without gross rupture of the strangulated segment. In the 4 remaining experiments there was an immediate effect which consisted of a marked sudden fall in blood pressure followed by a sharp rise and the next day all 4 animals were dead. In 3 of these 4 instances the peritoneal fluid was obtained from animals in which the loops had ruptured. The fourth animal had died with an intact loop, but the wall of the gut was so necrotic that it

* This work was supported in part by Grant 244 allowed by the Committee on Scientific Research of the American Medical Association.

[1] Stone, H. B., and Firor, W. M., *Trans. South. Surg. and Gynec. Assn.*, 1924, **37**, 173.

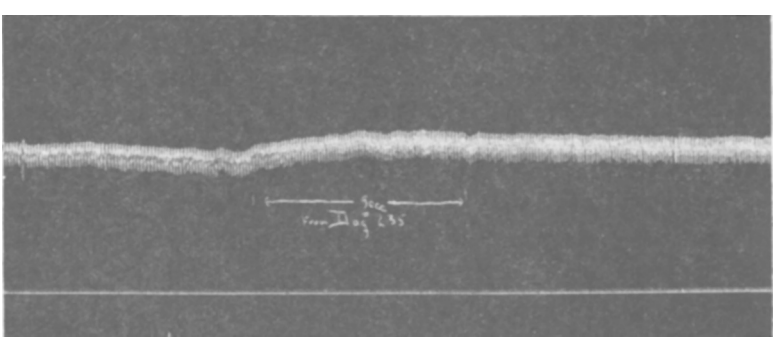
[2] Schönbauer, L., *Arch. f. klin. Chir.*, 1924, **130**, 427.

had to be handled with extreme care lest it rupture at any moment. The peritoneal fluid from these 4 dogs gave off a foul odor. Bacteriological examinations revealed the presence of innumerable an-

TABLE I.

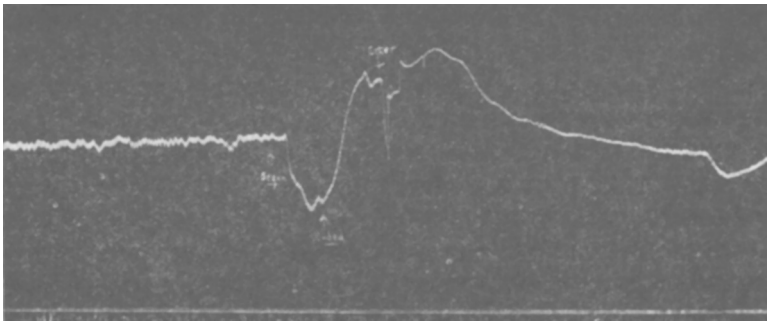
Strangulation Dogs				Normal Dogs
Exp.	Duration hrs.	Condition of bowel	Amount injected c.c.	Result
33*	4	Intact	100	No immediate or delayed reaction. 2 dogs.
34*	5½	"	50	No immediate or delayed reaction.
36*	6	"	50+ 90 blood serum	No immediate or delayed reaction other than slight (10 mm.) rise and fall in blood pressure to normal.
41*	8½	"	185	No effect on blood pressure other than slight rise—no delayed effect.
37*	6½	"	80+45	No immediate or delayed effect other than slight rise in blood pressure.
42*	19	"	120	No immediate or delayed effect other than slight rise in blood pressure.
43*	18	"	90	No immediate or delayed effect other than slight rise in blood pressure.
44*	17	Ruptured	100	Abrupt fall in blood pressure followed by rise—dead next morning.
50†	1	Intact	20	No effect.
47‡	7	"	20	No effect.
45‡	18	Intact, very necrotic	20	Abrupt fall in blood pressure to 60 mm. followed by abrupt rise to 135 mm. Dog killed.
48‡	15	Ruptured	40	Very abrupt fall in blood pressure to 85 mm. followed by a rapid rise to 240 mm. Dead next day.
46‡	27	"	20	Marked fall in blood pressure followed by gradual rise. Dead next day.

*Encirclement. †Venous. ‡Complete.



TRACING 1.

Effect on blood pressure of intravenous injection of peritoneal fluids obtained from a dog dying of intestinal strangulation without rupture of loop.



TRACING 2.
Effect on blood pressure of intravenous injection of peritoneal fluid obtained from a dog dying of intestinal strangulation with a ruptured loop.

aerobic and aerobic organisms. For details of experiments see the table and tracings.

Conclusions. The peritoneal fluid obtained from dogs dying of strangulation obstruction is non-toxic, when injected intravenously into normal dogs providing the strangulated loop is not ruptured or about to rupture and the fluid does not give off a foul odor. We do not deny that the peritoneal fluid may contain toxic products, but they are not demonstrable, at least on injection into other dogs until rupture of the loop.

5976

Can Immunity to Tetanus be Produced by the Oral Route?

MELVILLE H. MANSON. (Introduced by Owen H. Wangensteen.)

From the Department of Surgery, University of Minnesota.

The problem of producing an acquired, systemic immunity to diseases of bacterial origin by the oral administration of organisms or their growth products has been studied sporadically since 1880. The majority of investigations have been undertaken in diseases that have either the portal or entry or their pathology in the gastro-intestinal tract, as in typhoid fever, dysentery, and intestinal anthrax. This study was undertaken because of the undisputed opinion based on experimental evidence in the literature that a systemic immunity to tetanus could be produced by the oral administration of tetanus bacilli.