

McLean and Andries³ and Werelius⁴ have previously failed to elicit toxic effects in transfusing normal dogs with systemic blood from dogs with intestinal obstruction. Wangensteen and Loucks⁵ were unable to detect evidence of histamine absorption when histamine dichloride was placed in the obstructed bowel. It is a significant fact that in the experiments reported here that portal blood of dogs dying of intestinal obstruction failed to exhibit the physiologic test for histamine; the addition of 10 mg. of histamine dichloride, however, produced immediate and protracted depression of blood pressure.

5058

Observations on Intestinal Obstruction Following the Intravenous Injection of Particulate Material.

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The cells which are grouped together under the name of the reticulo-endothelial system phagocytose particulate material and destroy or neutralize the action of many soluble toxins present in the circulating blood. The present study was made to observe if a partial blockage of the phagocytic ability of the reticulo-endothelial system had any effect on the length of time an animal would survive following the production of a complete obstruction in the distal portion of the ileum.

Rabbits were selected as most suitable for these experiments. All surgical work was performed under ether anesthesia and with sterile technic. Routine necropsy examinations were made on each animal. To determine the length of time a normal rabbit would live following the production of a complete obstruction in the distal portion of the ileum the following preliminary experiment was performed: In a series of normal rabbits which weighed between 1200 and 3100 gm. a complete obstruction was made by placing a tie of tape 10 cm. proximal to the ileo-cecal valve. Three rabbits lived from 40 to 50 hours; 3 lived from 60 to 70 hours, and 4 lived from 70 to 89 hours after the operative procedure. Forty-four hours

³ McLean, A., and Andries, R. C., *J. Am. Med. Assn.*, 1912, lix, 1614.

⁴ Werelius, A., *J. Am. Med. Assn.*, 1922, lxxix, 535.

⁵ Wangensteen, O. H., and Loucks, M., *Arch. Surg.*, 1928, xvi, 1089.

was the shortest period while 89 hours was the longest period any animal survived the operation. The average length of life was 65.8 hours. A second series of 11 normal animals which weighed between 1150 and 3000 gm. were selected. A colloidal preparation of graphite was made and injected intravenously at daily intervals. To avoid the formation of emboli the first injection consisted of as small quantities as 0.5 cc. of the graphite preparation. This amount was gradually increased until 10 cc. was injected at one time. The total quantity injected into the animals varied from a minimum of 32 cc. to a maximum of 105 cc. After certain amounts of graphite had been injected the animals were not disturbed for 2 days. A complete obstruction was then produced in the distal ileum 10 cm. proximal to the ileo-cecal valve.

TABLE I.
Length of Life Following the Production of Intestinal Obstruction in Rabbits
with Partial Blockage of the Reticulo-endothelial System.

Number	Sex	Weight in gm.	Total quantity of graphite in- jected intra- venously	Quantity of graphite in- jected per kilo body wgt.	Length of life in hours after the production of intestinal obstruction
1	F	3000	32	9	26
2	M	1700	35	20	21
3	F	1650	35	21	29
4	F	1300	35	26	34
5	M	1500	50	33	12
6	M	1350	55	34	20
7	M	1550	55	35	21
8	M	1900	105	52	7
9	F	1400	105	69	6
10	F	1300	105	75	6
11	F	1150	105	90	5

The length of survival following the production of complete obstruction 10 cm. from the ileo-cecal valve was definitely shorter among 11 rabbits with a partial blockage of the reticulo-endothelial system than among normal rabbits. The shortest time a rabbit with partial blockage of the reticulo-endothelial system lived after the production of complete obstruction in the distal portion of the ileum was 5 hours and the longest period 26 hours. The average duration of life in this group was considerably less than among the normal animals. There appeared to be a relation between the quantity of particulate material ingested by the cells of the reticulo-endothelial system and the length of survival following the production of intestinal obstruction.