pears that following any major operative procedure the entire reticulo-endothelial system is mobilized for the defense of the body against the action of toxic material. The relatively few reticulo-endothelial cells found in the cortex of the adrenal gland do not appear to produce a specific substance for the defense of the body against the toxin produced in intestinal obstruction.

5060

The Effect of Ether and Chloroform on Kidney Function in Dogs With Obstructive Jaundice.

B. DALTON, L. SPERLING, H. DVORAK AND O. H. WANGENSTEEN.

From the Department of Surgery, University of Minnesota.

Clairmont and Haberer[1] first directed attention to the terminal anuria that occasionally accompanies protracted obstruction of the common bile duct. This happening has frequently been observed since then but the mechanism of its occurrence is not well understood. It has been believed that the administration of ether anesthesia to patients with obstruction of the common bile duct has played a significant rôle in precipitating this event.

In this study we had planned to determine whether any of the commonly employed anesthetics have a deleterious influence on the kidney function in the presence of obstructive jaundice. Not having obtained any manifestations of such injury with chloroform or ether no further observations were made with other anesthetics in common use.

The common bile duct was divided and ligated in 16 normal dogs under aseptic conditions. Following the convalescence of the animal, deep ether anesthesia was administered for an hour at brief intervals (usually a week apart) following which the excretion of phenol-sulphon-phthalein and the blood urea and icterus index were obtained on 2 occasions soon after recovery from the anesthetic and again before its repetition a week later. In a few other dogs similarly obstructed, chloroform was administered in one instance by stomach tube and to 4 others by inhalation.

Blocks of tissue from the kidney and liver were obtained at necropsy from all the dogs that served as subjects of these experi-

[1] Clairmont, P., and Haberer, H., *Mitt. u. d. Grenzgeb. d. Med. u. Chir.*, 1911, xxii, 159.

ments. The kidneys exhibited typical tubular degeneration; in most instances this finding was striking. Fat stains made of the kidney showed a corresponding fatty degeneration of the tubules. Biliary pigment and albumin were usually observed within the lumen of the tubules. Bile pigment was also found deposited within the renal cells. In the liver marked central necrosis of the lobules with fairly normal periportal spaces were seen. Only in one instance was there evidence of a proliferating process suggestive of cirrhosis in the periportal spaces. In this instance the central necrosis was minimal. Fat stains demonstrated marked fatty degeneration of the liver in all specimens.

TABLE I.
Dogs With Common Bile Duct Obstruction by Ligation and Division.

Dog number	Survival in days	$CHCl_3$ Administration			P. S. P. Output		Blood urea nitrogen		Icterus index. Highest value reached
		By stomach tube. No. times given. Each time 10 cc.	By inhalation. No. times given 10 cc.	Ether by inhalation 1 hr. No. times given	Preoperative %	Postoperative %	Preoperative. Mg. per 100 cc. blood	Postoperative. Mg. per 100 cc. blood	
1	54	9		4	80	80-100	10.26	8.0 -10.26	72
2	5			1	90		15.86	24.64*	
3	84			3	50	40-50	16.8	8.4 -18.9	18
4	83			3	35	20-90	12.13	13.06-17.02	24
5	13			2	60-65	50			
6	27			3	50-60	35-50		71.85*	128
7	9			2	80	45-80		51.26*	128
8	59			7	55-85	45-85	16.8 -21.1	14.3 -19.01	112
9	87			7	50-60	55-70	19.6	13.2 -19.1	80
10	51			6	45-60	50-80	14.1	18.13	48
11	14			1					
12	36		1	1	80	70			
13	3			1	55				
14	8		1	1	85	85	22.4		
15	31		3	1	70	70-80	24	10.2	112
16	26+		4	1	80	45-60		23.5	

* Terminal.

Briefly it may be stated that no evidence was obtained to indicate that the administration of ether or chloroform impaired the kidney function in an animal with complete obstructive jaundice. The phenol-sulphon-phthalein excretion remained normal up to the end, and in 2 instances only was a terminal increase in the blood urea noted.