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Effect of Prolonged Stasis on the Bile Salt-Cholesterol Ratio.

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In our studies of the relative concentration of cholesterol in the bile and bile salts which hold it in solution, the element of time in which the bile lies in the gall bladder is important. If prolonged stasis produces any differential absorption it would profoundly influence the likelihood of cholesterol precipitation. As shown in previous papers[1, 2] the ligature of the cystic duct in a dog brings about marked infection in the gall bladder but common duct ligature, although it usually results in the presence of bacteria in the bile, only occasionally causes a marked cholecystitis. In the series of experiments reported below pathological studies of the gall bladders are reserved for a later paper and only the chemical investigations are included here.

Fifty-one dogs were used and the common ducts ligated and the animals sacrificed or died at various periods.

TABLE I.

Time days	No. of dogs	Chol.	B.S.	B.S./Chol. ratio
1	15	62	3440	55
3-5	9	69	3157	45
6-12	12	78	4741	61
13-42	8	24	1219	52
44-80	7	41	2034	49

It can be seen from these data that there is no differential absorption of either bile salts or cholesterol. Prolonged stasis does not cause any change in the bile salt-cholesterol ratio, and hence cannot be considered as a factor in gall stone formation *per se*. Other points to be noted are the wide fluctuations in both the bile salts and cholesterol but the tendency of the ratio between the 2 to remain at a fairly definite level.

Of 51 operated dogs 25 died and 26 were killed. In the 2 series the average cholesterol content was the same but in the dogs who died the average bile salt content was 25% lower. This observation is of importance as it throws considerable doubt on chemical examination of post mortem material whether human or experimental in

[1] Andrews, E., Hrdina, L., *Am. J. Med. Sci.*, 1931, **181**, 478.

[2] Andrews, E., Hrdina, L., *Arch. Surg.*, 1931, **23**, 201.

studies of this sort. Probably the liver during the agonal period secretes a bile with considerably less bile salt content. Whipple[3] showed that the diseased liver behaved in this manner. These observations were confirmed[4] in our laboratory and it was also shown that the liver if diseased might secrete uncombined bile salts which of course do not show in the gasometric analysis of Van Slyke.

[3] Whipple, G. H., *Phys. Rev.*, 1922, **2**, 440.

[4] Andrews, E., Hrdina, L., Dostal, L. E., *Arch. Surg.*, to be published.