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Blood platelets in rabbits following splenectomy and transplantation of the spleen.*

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While cooperating with Drs. Isidore Cohn and I. I. Lemann during the course of some experimental work on rabbits, observations were made on the blood platelets following splenectomy and transplantation of the spleen.

Under ether anaesthesia the spleen was removed and the whole organ immediately transplanted beneath the rectus sheath of another etherized animal. After a period of 25 to 35 days the animals were killed. At post-mortem the grafts were found to have been completely destroyed and largely replaced by a necroticmass, all transplants being considered non-functional.

Blood platelet counts were made before operation and at intervals of 24 to 48 hours after operation until the animal was killed, covering the period of 25 to 35 days. The average number of platelets in all animals before operation was found to be 375,000 per cm. of blood. Forty-eight hours after operation there was an average of 475,000 per cmm. in the spleenectomized group, and an average of 573,000 per cmm. in the group of recipients. During the first ten days after operation this primary increase was sustained, the number of platelets being approximately the same in both groups on the tenth day, averaging 476,000 per cmm. in the donor group and 466,000 per cmm. in the group of recipients. After the tenth day the number of platelets gradually decreased in the recipient group, reaching the preoperative level about the twentieth day and remaining normal thereafter. In the other group the increase was sustained throughout the entire period of postoperative observation. Two animals of this group were observed over a period of 35 days after operation, at the end of which there was approximately 500,000 platelets per cmm. present in each case, or approximately 125,000 per cmm. more than before operation.

The initial increase in platelets in both groups of cases we at-

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tribute to the response of the organism to traumatism, the sustained increase in the group of donors we attribute to the absence of the destructive properties of the spleen for blood platelets.

Technique employed in counting platelets: considerable difficulty was experienced in finding a method by which we were able to get accurate results. A large number of methods, both direct and indirect, were tried. The chief difficulty encountered in making direct count was in obtaining a satisfactory diluting fluid. Various anti-coagulants were used with and without the addition of dyes. Of these solutions those without the addition of dye were far more satisfactory. The difficulty with the clear fluids was the ever present tendency of the platelets to clump together, while with the solutions containing the dye there was added the great difficulty of differentiating the platelets from certain bacteriae and other foreign bodies that take a similar stain. Of the indirect methods the technique described by J. H. Pratt[1] proved most satisfactory, but because of the time consumed in making these counts all indirect methods were considered impracticable. However, while using Pratt's technique it was observed that clumping rarely occurred in the preparation. Hence, the idea was evolved to use two per cent sodium metaphosphate made up in normal saline as a diluting fluid in making direct counts.

In the direct method the platelets are counted as in the enumeration of the red blood corpuscles, except that the following points must be observed:—

1. The puncture must be sufficient to obtain the flow of blood immediately with minimum manipulation.
2. The suspension must be promptly and thoroughly mixed.
3. The mount should be allowed to stand from 8 to 10 minutes before making the count.
4. At least twice as many fields should be counted as is done in enumerating the red blood corpuscles.

In our hands this method has been very satisfactory. The tendency of the platelets to clump is practically overcome and we have been able to check counts accurately.

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[1] Osler, Wm., and McCrae, *Modern Medicine*, Vol. iv, 694.