Platelets and the positive feedback of clotting what is normal?

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Hemostasis is the biological process of discontinuing injured blood vessels from bleeding while upholding regular blood flow in other areas. It includes clotting of the blood. If there is too much clotting, then blood vessels can get blocked, which are even not bleeding. Moreover, if there is little clotting then the result can be the excessive bleeding even from a slight injury. Thus, the body keeps control mechanisms to check the regulation of clotting. One such mechanism is clotting by platelets. Platelets being component of blood react to bleeding when there is an injury, forming the “platelet plug”. The platelet plug is formed by fibrin within the several minutes of the injury, known as adhesion stage. After this, there are activation and aggregation stages leading to achieve hemostasis.

Moreover, blood coagulation is a result of a number of biochemical reactions. These reactions must move quickly to completion. For this quick process, there is another mechanism; positive feedback. Positive feedback is a kind of self-intensifying process that causes a stimulus to result in a greater change in a similar direction. Thus, when any blood vessel is damaged then platelets as a result of chemical signals stick to the vessel wall. These platelets then release more and more chemicals to accelerate the clotting process. This process finishes once a clot has mended the vessel wall.

Positive feedback is harmful in most cases for the body as it does not return the body to homeostasis but changes body status. But in the case of blood clotting, it is advantageous for the body when used in a limited fashion. More and more platelets get activated due to multiple positive feedback reactions. For instance, positive feedback activates enzymatic proteins resulting in the formation of fibrin that functions in blood clotting (Jesty & Beltrami, 2005). Furthermore, during this loop, after the formation of thrombin, there is also activation of platelets.

 References

Jesty, J., & Beltrami, E. (2005). Positive feedbacks of coagulation: their role in threshold regulation. *Arteriosclerosis, Thrombosis, and Vascular Biology*, *25*(12), 2463–2469.