Chapter 7

TOPICAL HEMOSTATIC AGENTS IN OBSTETRICS AND GYNECOLOGY

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Although topical hemostatic agents are not the first line of treatment for managing bleeding, electrocautery, sutures, and clips are used in addition or as an alternative to standard surgical techniques. These are generally useful in cases of uncommon bleeding; bleeding from tissues adjacent to sensitive structures, such as ureter and nerves; and bleeding with hemostatic abnormalities (congenital or acquired). In short, these are auxiliary agents used to stop intraoperative bleeding under specific conditions.

It is important to understand the normal physiology of hemostasis before considering the use of these agents. Thrombin is formed as a result of the process that needs to be activated by factor X through both intrinsic and extrinsic pathways. Fibrin is formed from fibrinogen and provides a stable clot by establishing crosslinks (1).

Topical Hemostatic Agents

There are physical, biological, and caustic hemostatic agents. These are described below.

Caustic agents include aluminum chloride, ferric sulfate (Monsel's solution), silver nitrate, and zinc chloride. Caustic agents increase hemostasis by acting mainly through tissue necrosis and scar formation, especially when used on the cervix and vagina. They are not suitable for intraabdominal use (2).

Physical agents include cellulose, gelatin, or collagen, which activate the extrinsic pathway. These are not suitable for those with severe coagulopathy because of the problematic pathway. Physical agents generate stimuli that activate platelets and the extrinsic pathway and create a scaffold for thrombus. The dry matrix also absorbs water, concentrates hemostatic factors, and acts as a cushioning to vessels (1). The various physical agents are described below.

The dry matrix is formed by agents that activate the coagulation stage and enable thrombus formation. It is easy to use and is applied to the bleeding area

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thrombin gelatin matrix is used alone or in combination with ORC (17).

Pooled human thrombin and fibrin adhesives containing human fibrinogen have a theoretical risk of viral transmission (18). Allergic reactions and immunological events are seen mostly with biological agents. Bovine thrombin may cause development of antibodies against factor V and thrombin, causing allergic reactions and severe postoperative bleeding and immune-mediated coagulability (19). There may be allergic reactions from aprotinin in some of the fibrin sealants and anaphylaxis from repeated exposure (20). The use of spray fibrin sealants can cause death from a gas embolism (21).

CONCLUSION

Topical hemostatic agents are auxiliary substances in cases in which the surgical procedure, such as electrocautery, suturing, and clips, cannot be used to control nonspecific bleeding. Which type of agent will be used can vary depending on the character, amount and location of bleeding, availability, cost, and surgeon's choice.

Topical hemostatic agents have different mechanisms of action, side effects, and costs. Although physical agents are preferred for less-severe bleeding because of their low cost, biological agents are used in cases in which there are coagulation disorders and more-severe bleeding. The main side effects of physical agents are infection, granuloma, and fibrosis; whereas, those of biological agents are more often infection and allergic and immunological reactions. Fibrin sealants are the most expensive agent but may be appropriate in cases that do not respond to other agents or in severe coagulopathies.

For these agents, which should be avoided for routine bleeding prophylaxis considering adhesion formation, infection risk, and other complications, surgeons should choose a treatment protocol only after considering their usability, side effects, and costs.

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