Fibrin sealants in clinical practice. [Review] [45 refs]

Authors: Albala DM

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Abstract:

Fibrin sealants are used in a wide range of surgeries, primarily as hemostatic agents, but also to assist tissue sealing and wound healing. While all fibrin sealants contain fibrinogen and thrombin, they differ in their final composition. This affects the properties of the resulting fibrin clot and may influence their use in different surgical procedures. Sealants with high concentrations of fibrinogen tend to produce stronger clots, whereas those containing higher concentrations of thrombin form clots rapidly. This is essential when rapid hemostasis is required to stop blood loss (e.g. suturing of blood vessels). However, in situations that require careful adjustment of tissue (e.g. a skin flap) a slower clot formation is advantageous. Some sealants are supplemented with factor XIII and this may increase the tensile strength and stability of the clot and improve hemostasis. Antifibrinolytic agents (e.g. aprotinin and aminocaproic acid) increase the lifespan of the clot by inhibiting fibrinolysis. Fibrin sealants containing aprotinin may have an added advantage when used on surgical sites with naturally high concentrations of fibrinolytic agents. The physical properties of the fibrin sealants also vary. For example, the fibrinogen component is relatively viscous and requires a lot of force to inject it through a long catheter. Fibrin sealants with a fibrinogen component of low viscosity are easier to use than highly viscous solutions in surgical situations where the sealant is applied by a catheter. Until recently, the use of fibrin sealants in the USA has been limited to noncommercial products--'home-brews'. The fibrinogen concentration of these products can vary between preparations, with subsequent variation in the mechanical strength of the clot making handling difficult. The introduction of commercial sealants into the USA with consistent composition should reduce the varying performance of fibrin sealants, although autologous and point-of-use

prepared sealants may still vary. Consistency of performance is expected to result in an increased use of fibrin sealants both in established and novel fields of surgery. [References: 45]