

Seroma prevention in a rat mastectomy model: use of a light-activated fibrin sealant.

Authors: Wang JY, Goodman NC, Amiss LR Jr, Nguyen DH, Rodeheaver GT, Moore MM, Morgan RF, Abbott RD, Spotnitz WD

Publication Date: 1996

Abstract:

Seroma formation following mastectomy and axillary dissection remains a common and significant problem contributing to patient morbidity and health-care costs. Previous data have suggested that fibrin sealant (FS), a biological adhesive, is capable of controlling lymphatic leakage and assisting with skin graft adhesion. In this study, the use of an experimental, light-activated FS under development by CryoLife (CFS) was evaluated in a rat mastectomy model in order to reduce seroma formation. CFS is a premixed form of FS, containing an inactivator that is reversed in the presence of light, causing sealant to form. In this model, rats underwent mastectomy and extensive dissection of the axillary lymphovascularity. Next, 1 ml of saline or FS was applied to the operative site and the wound was closed. Three groups of animals were evaluated 5 days postoperatively by measuring the volume (in milliliters) of seroma able to be aspirated from the surgical site. The saline control group (N = 20) had a seroma volume (mean +/- standard deviation [SD]) of 4.2 +/- 2.9 ml, while a form of CFS containing human fibrinogen (80 to 100 mg per milliliter) and human thrombin (20 U per milliliter) (N = 20) had a significantly smaller seroma volume of 1.1 +/- 1.6 ml ($p < 0.001$ analysis of variance). University of Virginia (UVA) FS, containing human fibrinogen (20 mg per milliliter) and bovine thrombin (500 U per milliliter) (N = 20), had a seroma volume of 2.0 +/- 1.6 ml ($p < 0.01$, compared to control; $p > 0.2$, compared to CFS). Thus, this form of CFS significantly reduced seroma formation compared to saline control and also appeared to result in a smaller fluid accumulation than with UVA FS, although this trend was not statistically significant. These data

suggest that the use of CFS may help to reduce seroma formation in humans.