

A Novel Method of Skin Closure for Aging or Fragile Skin

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PRACTICE POINTS

- A novel method of skin closure using a polyethylene film with an acrylate adhesive can aid in strengthening suture integrity and preventing skin tears.
- Dehiscence of excision sites in patients with aging or fragile skin can be prevented.
- This closure technique promotes healing and efficient scar formation.

A novel method of skin closure is detailed for surgical removal of tumors in patients with aging or thin and fragile skin. A polyethylene film with an acrylate adhesive was used as an adjunct to the dermis to help provide stability for suturing. Cases are presented with clinical photographs to demonstrate how this technique may prevent wound complications in elderly patients or those with fragile skin.

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Patients who have been on steroids, aspirin, or anticoagulants or who are elderly may have a fragile outer skin layer that is similar to parchment paper, which may be challenging for surgeons. In these patients, the epidermal layer is thin and translucent; when a surgeon cuts through this thin layer, the tissue beneath shows minimal dermis and poor-quality fat with weakened tissue support. When undergoing excisional surgery, there is no strong tissue to help the closure sutures remain intact. Surgeons may struggle with skin tears around the sutures and dehiscence on suture removal.

This article describes a novel approach to skin closure in patients with aging or thin skin using a polyethylene film with an acrylate adhesive in the excision area to aid in maintaining skin integrity throughout the healing process following surgery.

Closure Technique

First, the skin area is cleansed with a sterilizing soap preparation. A sterile marking pen then is used to outline the excision area. A 10×12-cm layer of polyethylene film is then attached to the excision site. Excision of the tumor is performed by cutting through the film in the marked area (Figure 1A), and closure is performed by suturing the wound edges through the polyethylene film while the area is still covered with the film (Figure 1B). The sutures can be left in for 2 weeks or longer if necessary. The patient should be instructed not to remove the film or perform any extensive cleansing of the treatment area. Antibiotics should be administered, as the polyethylene film maintains its sterile integrity for 7 days only. Because sutures are on the surface of the film, they are easily accessed for removal. Figure 1C shows the excision site after removal of the sutures and polyethylene film on the left tibia of a 95-year-old woman. Adhesive butterfly closures can be applied to strengthen the excision area after suture removal and prevent dehiscence.

Case Reports

Twelve procedures for skin cancer excision were conducted in 10 patients using polyethylene adhesive film as a surgical aid due to extremely poor quality

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Figure 1. The excision site was marked after polyethylene adhesive film was applied to a squamous cell carcinoma on the left tibia of 95-year-old woman (A). Closure was performed by suturing the wound edges through the polyethylene film (B). The excision site appeared to have no dehiscence or signs of infection after removal of the sutures and polyethylene film (C).



Figure 2. A squamous cell carcinoma excision site on the left tibia of an 82-year-old man that had been covered with polyethylene adhesive film prior to excision (A) and 17 days following removal of the sutures and film (B).

of the epidermis. The tumors were all squamous cell carcinomas and were located on the arms and legs. Patients were aged 73 to 95 years. Figure 2 demonstrates an example of excision of a squamous cell carcinoma on the left tibia of an 82-year-old man with prior dehiscence and infection after leg surgeries. Good results were achieved using the closure technique described here, along with prophylactic antibiotics.

One patient had complications from a *Staphylococcus* infection because antibiotics were not administered. The patient had prior infections with

other surgeries. Antibiotics were given 4 days after surgery. The infection was cleared and the polyethylene film was retained for a total of 12 days.

Sutures were removed after 14 days for excision sites on the arms and 17 days for excision sites on the legs. All excision sites healed without dehiscence with a cosmetically acceptable scar. Figure 3A shows a completed excision on the left hand of a 92-year-old man, and Figure 3B is the result 5 weeks after excision.

None of the patients reported discomfort from the polyethylene film remaining on the skin following



Figure 3. A squamous cell carcinoma excision site on the left thumb of a 92-year-old man that had been covered with polyethylene adhesive film prior to excision (A). No visible scarring or dehiscence was noted 5 weeks after excision, following removal of the sutures and film (B).

surgery, though postoperative care required extra caution when dressing so as not to disturb or compromise the film. Patients were advised about postoperative care and were instructed not to remove

the dressing. They were all given antibiotics as a necessary adjunct to maintain a lessened bacteria burden imposed by an impervious layer of acrylate adhesive. Complications resulted from failure to immediately provide antibiotics to 1 patient. The polyethylene film did not hinder healing or postoperative results.

Comment

Various techniques for handling fragile skin during surgery have been described in the literature. Fomon et al¹ discussed aging skin as it relates to plastic surgery. Foster and Chan² described a skin support technique for closing elliptical incisions in patients with fragile skin. Mazzurco and Krach³ discussed the use of a hydrocolloid dressing to aid in the closure of surgical wounds in patients with fragile skin.

The closure method described here was found to be particularly helpful when used as an adjunct to surgery in patients with fragile skin that lacked a suitable dermis. The polyethylene adhesive film helped to hold the sutures more securely. This method is cost-effective and is associated with a high level of patient satisfaction. For the surgeon, this technique may aid in dealing with difficult surgical situations and helps prevent wound complications in elderly patients or those with fragile skin.

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