

Capsular Tissue: A New Local Flap

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Capsular tissue, the interface that forms between an implanted device and the body's own soft tissues, has recently been shown to develop its own unique blood supply. This capsular tissue with its extensive vascular plexus has not been described previously as an isolated flap. The purpose of our study was to determine whether an isolated flap of capsular tissue would survive as a local pedicle flap and provide enough inherent vascularity to support a skin graft. Isolated expanded and nonexpanded capsular flaps were compared by using 20 expanders (10 expanded and 10 nonexpanded) in two mixed-breed female pigs. Expanded and nonexpanded capsular flaps were elevated 8 weeks following expander placement. These flaps were raised on their capsular bases alone, and skin grafts were placed onto the capsular surfaces. All the expanded capsular flaps and their skin grafts had 100 percent survival. Skin grafts on the nonexpanded flaps survived an average of 28 percent, with graft survival corresponding to flap survival. This study confirms that flaps of isolated expanded capsular tissue survive and provide enough inherent vascularity to support a split-thickness skin graft. (*Plast. Reconstr. Surg.* 91: 1073, 1993.)

In discussing the limitations of local flap tissue reconstruction of the upper extremity, Lesavoy noted, "Whenever flap tissue is considered, it must be recognized that it is not 'free': Peter can pay Paul only if Peter can afford."¹ However, tissue expansion has been shown to cause a net increase of donor tissue available for local flap transfer.²⁻⁷ Expanded capsular tissue also has been found to develop an extensive vascular plexus, with improved blood flow and survival of expanded flaps over nonexpanded control flaps.⁶⁻⁹

Closure of complex wounds, particularly of the extremities, head, and neck, can be difficult and often requires the use of distant flaps or

free-tissue transfer. We designed an experimental protocol to determine if the vascularized capsular tissue that forms spontaneously around tissue expanders could provide a new source of tissue for wound closure.

This study addressed these questions:

1. Can an isolated flap of capsular tissue survive as a separate entity?
2. If isolated capsular flaps of tissue do survive, will they provide enough vascularity to support a skin graft?
3. Are there any differences in survival comparing expanded versus nonexpanded flaps?
4. Are there any new histologic characteristics in comparing expanded and nonexpanded capsular tissue-skin graft interfaces?

MATERIALS AND METHODS

Animal Protocol

Two female mixed-breed pigs (30 ± 2 kg, mean ± SEM) were housed in separate large pens in temperature-controlled (24 to 25°C) and light-controlled (0700 to 1900) rooms. Both animals were given food and water ad libitum. Tetracycline, 250 mg (80 mg/kg), was administered with the animals' water 1 day before and 7 days after initial placement of tissue expanders.

Surgical Procedure

Each animal was injected with 150 mg (5 mg/kg) Telazol, a combination dissociative anesthetic and tranquilizer (A. H. Robins, Rich-

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