

Comparison of gross and histologic tissue responses of skin incisions closed by use of absorbable subcuticular staples, cutaneous metal staples, and polyglactin 910 suture in pigs

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Abstract

Objective—To assess gross and histologic tissue responses of skin incisions closed by use of absorbable subcuticular staples, cutaneous metal staples, and polyglactin 910 suture in pigs.

Animals—8 purpose-bred disease-free pigs.

Procedure—Pigs were randomly allocated to 1 of 4 groups from which tissues were collected after death on postoperative days (PODs) 7, 14, 21, or 42. In each pig, 4 incisions were made; 1 was closed subcuticularly with 3-0 polyglactin 910 suture, 1 was closed with metal staples, and 2 were closed with absorbable subcuticular staples. Incision sites were grossly evaluated every 3 days after closure. At necropsy, incision sites and surrounding tissues were examined histologically; a histopathologic scoring system was used to quantitate healing and tissue response directed against the closure material.

Results—Postoperatively, the metal staples induced a severe inflammatory response, compared with minimal inflammation associated with the suture or absorbable subcuticular staples. Histologic evaluation of incisions on PODs 7, 14, and 21 revealed less severe inflammation associated with absorbable subcuticular staples than that associated with the other materials.

Conclusions and Clinical Relevance—Results indicated that absorbable subcuticular staples induced a less severe inflammatory response [with minimal scarring] in the early stages of healing in pigs, compared with other commonly used methods of wound closure. Use of absorbable staples potentially combines the benefits of subcuticular closure with the speed and precision of staple placement.

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