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Dermazip for Surgical Wounds Closure

Vorvat Choomsai Na Ayudhya, MD
Sopot Wudhikarn, MD
Division of Urology, Department of Surgery, Faculty of Medicine,
Maharaj Nakorn Chiangmai Hospital, Chiangmai University, Chiangmai, Thailand.

Abstract: **Closure of skin incision by sutures frequently leaves undesirable pricking scar because the ligatures create cross-hatching and strangulation as well as increase wound infection potential. These factors may result in compromised cosmetic effect. Dermazip wound closure of various type of straight surgical incision was employed in 50 patients with satisfactory results. The use of Dermazip wound closure enhances cosmetic result by maintaining wound edges approximation without causing cross-hatching and wound strangulation. Dermazip offers easy application and rapid skin closure with its ease and painless removal.**

Most surgeons would agree that closure of a surgical wound with any suture materials (silk, nylon or staples etc) for approximation of the wound edges might cause a minute scar in the region of the pricking skin. If the ligature is tied too tightly the skin edges are more compressed producing cross-hatching and strangulation with lymphatic drainage obstruction resulting in wound edema. Certain types of ligature may increase infection potential[1,2] or tissue reaction producing a larger and undesirable scar subsequently. Removal of sutures or skin clips also produces an uncomfortable minor pain.

The Division of Urology, Department of Surgery, Faculty of Medicine, Maharaj Nakorn Chiangmai Hospital initiated the use of *Dermazip*, a commercial nylon zipper, for surgical wound closure in 50 patients. The application of Dermazip for approximation of surgical wound edges helps to minimize wound complications and substantially decreasing the time for wound closure.

Materials and Methods

Dermazip production

Commercial nylon zipper in various length (6", 8" and 12") is widely available in any garment stores. We fix the nylon zipper to a piece of steridrape (3M) by sawing or superglue to become a Dermazip. The portion of steridrape beneath the teeth of the zipper is then cut along its entire length. The Dermazip so produced is packed in a plastic wrapper and sterilized with gas prior to use (Figure 1).

Selection of patients

Patients selected for Dermazip wound closure were the adult cases whose surgical procedures were

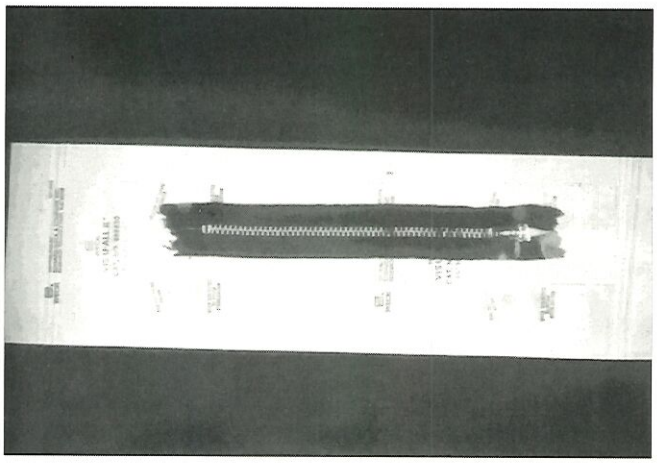


Fig. 1 *Dermazip* made from commercial nylon zipper in sterilized pack ready for use.

not concerned with suppurative infection. The proposed surgical incision should be a straight line incision and not in the vicinity of a mobile region such as joints.

Application of Dermazip closure

To prepare for skin closure using Dermazip, subcutaneous fatty tissue closure with absorbable suture materials may be necessary especially when the fatty tissue is rather thick. The skin around the wound edges must be clean and dry. Dermazip with appropriate length, 1-2 inches longer than the length of the incision, is selected.

Apply the Dermazip by peeling off the adhesive covering of the Steridrape and open up the zipper. Place the center of the lower end of Dermazip on the skin about an inch from the corner of the wound (Figure 2A). Then carefully place each limb of the open zipper about $\frac{1}{4}$ inch from the incision along the corresponding wound edges (Figure 2B). Carefully close the zipper gradually as well as adjusting the skin edge alignment by the aid of tissue forceps (Figure 2C). The sliding tab of the zipper should be put into the locked position and kept protected from accidental pulling.

In the case of a long mid line incision across the umbilicus, placement of the Dermazip is made straight across the umbilicus and one or two interrupted non-absorbable sutures are placed to close the portion of incision curving around the umbilicus in the usual manner. Leave the Dermazip in place for one week.

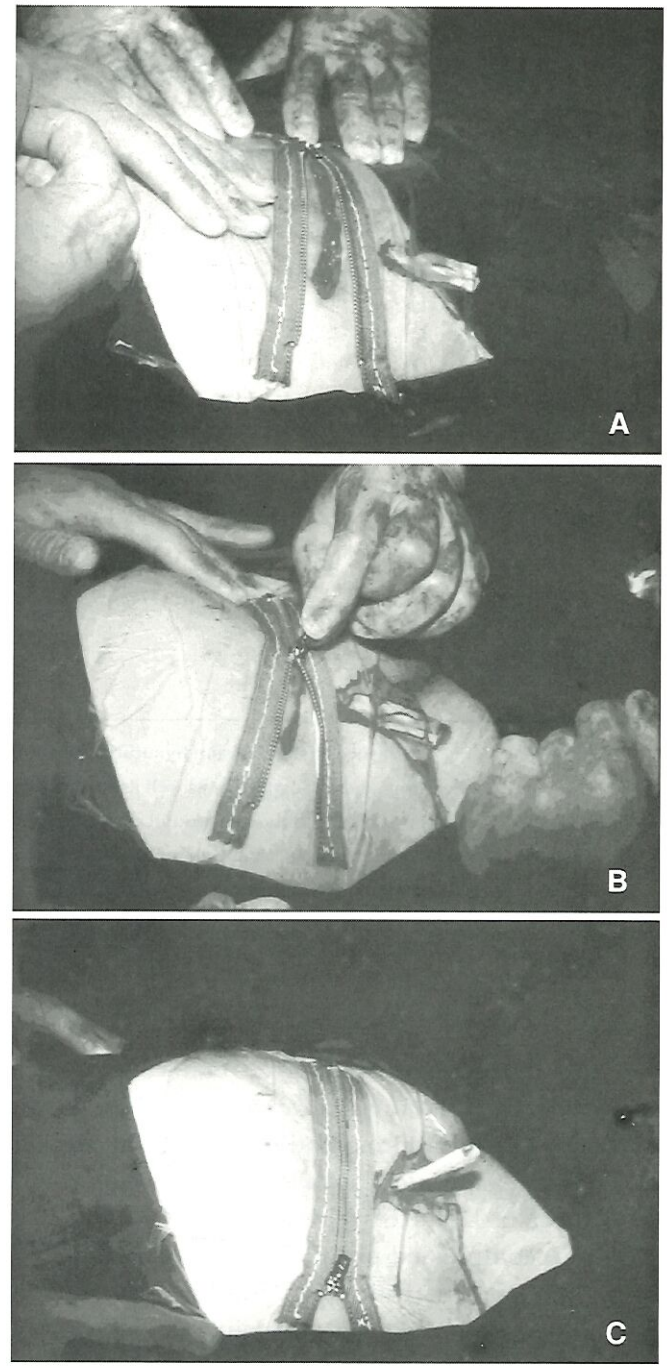


Fig. 2 A. Dermazip placement starting at an inch from one corner of the wound.
B. Placing each limb of the Dermazip along the corresponding wound edges.
C. Closure of the zipper.

Healing of the wound can be assessed by partial opening the zipper for examination. With satisfactory wound healing, the Dermazip can be removed by simple peeling it off without having to cut anything at

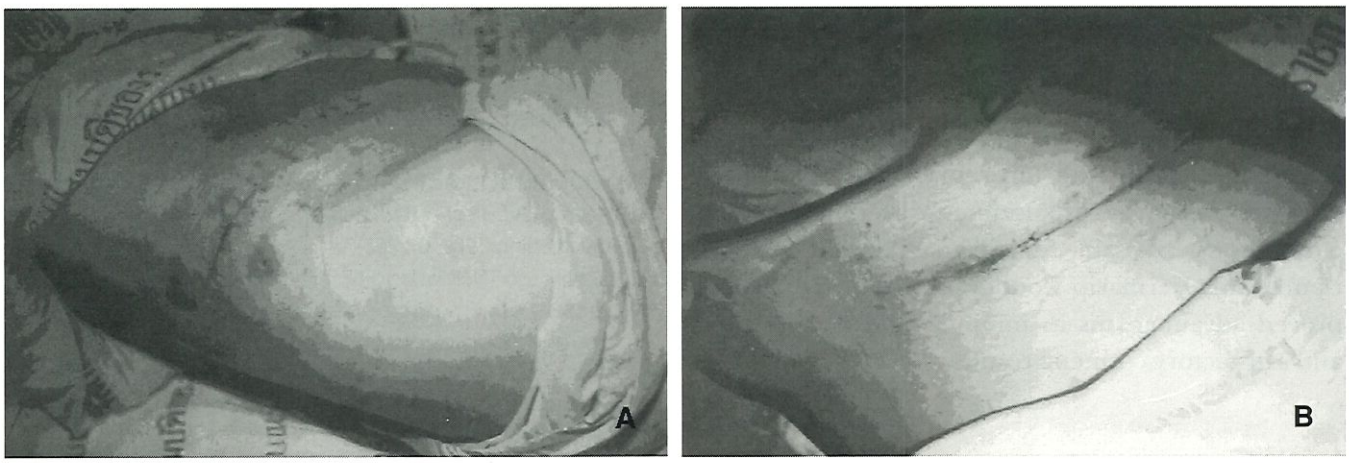


Fig. 3 A. Wound appearance following conventional wound closure with suture materials showing cross hatching marks and minute scars at skin pricking sites.
B. Wound appearance following Dermazip wound closure which leaves a linear scar with satisfactory cosmetic result.

Table 1 Type and number of Dermazip wound closure in 50 patients.

Incision Type	Number of Case
Low transverse abdominal incision	10
Low mid-line abdominal incision	10
Flank incision	19
Gibson incision	10
Kocher incision	1
Total	**50**

Table 2 Advantages in using Dermazip wound closure

1. Decrease wound edema
2. No stitch abscess
3. Decrease operative time
4. Enhance cosmetic results
5. Inexpensive
6. Ease of removal without pain or discomfort

all. It is also important to emphasize to the patient that the zipper should not be opened before a week time.

Results

Dermazip wound closure was employed for surgical wounds on 50 patients with satisfactory wound healing achieved in all cases (Figure 3). The types of surgical incisions were outlined in Table 1. All patients, especially the female, were so pleased with its painless removal and the cosmetic results. Dermazip wound closure provided many advantages as shown in Table 2.

Discussion

Suture remains the most common method for surgical wound closure. However, selection of materials for wound closure is important.[3] Monofilamentous suture (polypropylene, nylon, etc) is found to cause less tissue reaction and more resistant to infection as compared to surgical silk.[4,5,6] They are the suture materials of preference and commonly used in the closure of skin wounds. Closure of surgical incision by suturing consumes considerable length of time especially in long incision. They also cause wound strangulation, cross hatching marks and discomfort or pain upon removal. Staplers offer many advantages over the conventional suture materials in do not cause cross hatching marks and wound strangulation. However, a minute scar usually occurred at the pricking skin sites.[3] The advantage of using skin tape (Steristrip, Leukostrip, etc) is to hold wound edges together without skin puncture.[7] This helps to avoid suture marks and tissue strangulation. However, skin tape is commonly used in small or superficial wounds in plastic surgery and located in less movement area. Wound edges under some tension and those that tend to invert can not be

adequately approximated underneath the skin tape. Blood or serum may cause skin tape to lift off prematurely.

Application of zipper in closing the long incision wound in patients with hip replacement and spinal surgery was reported by Rosenberg.[8] Dermazip wound closure is not advisable for use in children. Our experience with Dermazip wound closure in 50 patients proved advantageous in minimizing operative time and satisfactory cosmetic results.

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