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THE SURGEON AT WORK

PAPER TAPE IN THE CLOSURE OF ABDOMINAL WOUNDS

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WOUNDS closed by adhesive tapes have many advantages—there is a less pronounced inflammatory reaction than in wounds closed by sutures, a decreased rate of wound infection, the absence of puncture scars (Fig. 1), no abscess at the stitches and greater tensile strength than sutured wounds late in the healing process (20 to 150 days) (1-3). However, this simple, effective technique has not been widely used for closure of wounds because of loss of adhesive properties

after sterilization and weak supporting strength of the tapes. A variety of adhesive tapes (such as Steri-Strip® [3M], reinforced Steri-Strip® [3M] and Proxistrip® [Ethicon, Inc.]) have been designed with a tape backing and a chemical adhesive to increase the adhesive properties and supporting strength (4, 5). These special backing tapes are more expensive than paper tape.

Paper tape is used in our hospital for delayed or secondary closure of infected wounds. It is easy to use and has satisfactory supporting strength. Therefore, we use paper tape to close the abdominal wounds instead of using Steri-Strip or reinforced Steri-Strip, which have been reported

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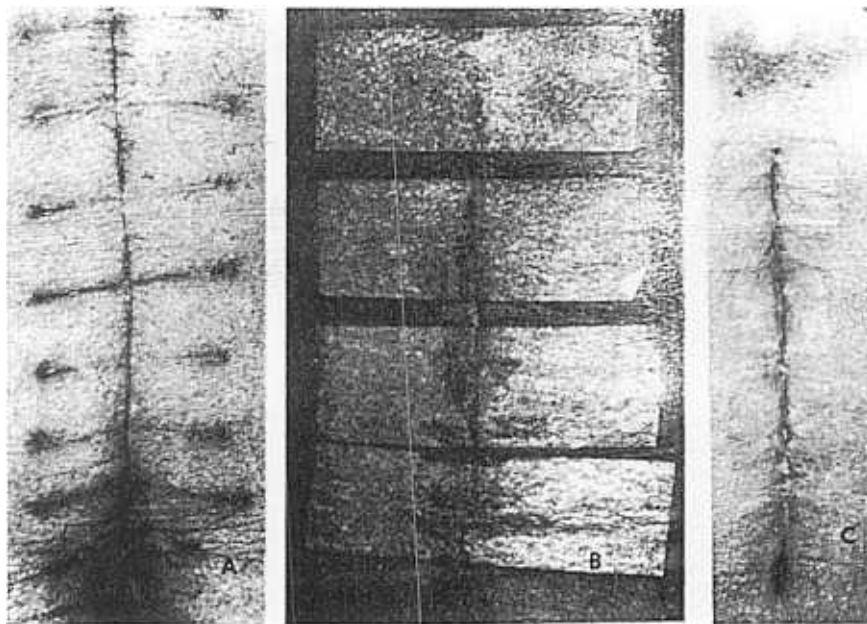


FIG. 1. A, A healed abdominal wound closed by sutures with puncture scars; B, a vertical epigastric midline laparotomy wound closed by paper tape—a small amount of discharge appeared under the strips of paper tape, and C, the wound shown in B healed with satisfactory cosmetic results ten days after operation.

to have satisfactory results in abdominal wound closures (2, 4).

TECHNIQUE

Strips of 1 inch Micropore® Hypoallergic Surgical Tape (3M) were placed on slightly larger strips of polyethylene cut from Steri-Lok® polyethylene tubing (3M). These strips were then packed and sterilized with ethylene in the usual manner.

The deep layers of the abdominal wound were closed as usual; the peritoneum was not closed and the muscle sheaths were closed with nonabsorbable silk sutures. Hemostasis of the subcutaneous layer was performed with electrocauterization. Subcutaneous sutures were not performed even in obese patients (subcutaneous fat 2 centimeters). The skin was cleaned and dried. Adhesive adjuncts were not used. A sterile paper tape 10 centimeters long was applied to the skin on the side away from the surgeon, and traction was applied to approximate the edge of the skin accurately. The tape was then laid across the wound. Sometimes, the assistant would apply pressure on both sides of the wound to help appose the edges of the wound. The gaps between the strips of paper tape were 0.5 centimeter (Fig. 1B). The wound was then covered with gauze dressing.

Postoperative management of the taped wounds was similar to that of sutured wounds. On the first postoperative day, the dressing was removed and the wound was examined. If discharge on the paper tape was thick, the tape was removed and replaced with new strips of paper tape. The wound was not covered with dressings after the first postoperative day. The strips of paper tape were retained in position for seven to ten days after operation, then they were peeled from one end and removed carefully. New strips of nonsterile paper tape were applied to the wounds as a routine method for the sutured wounds after removing the stitches. If infection was detected in the wound, the strips of paper tape would be removed. After treatment, secondary closure of the infected wound was again performed by paper tape.

RESULTS

We have used paper tape to close abdominal wounds in 42 patients who had either a malignant or benign disease. There were two intra-abdominal abscesses that were not related to the closure method. Three patients with wound infection had contaminated wounds—one patient had traumat-

ic perforation of the duodenum and the other two patients had perforated ulcers of the duodenum. Strips of paper tape were changed at the bedside of three patients on the first postoperative day because of heavy wound discharge on the tape. All the wounds closed by paper tape healed well and were cosmetically satisfactory (Fig. 1C). No subcutaneous hematoma, skin separation, skin itching or allergic reactions to the tape was seen. No patient complained of discomfort or tightness of the wound, which is common in sutured wounds.

The adhesive property of the sterile paper tape was good. There was no premature peeling of the tapes. The tape adhered well to the skin without using any adhesive adjuncts, such as tincture of benzoin. A minimal amount of discharge appeared under the strips of paper tape (Fig. 1B). The discharge did not interfere with healing of the wound and it did not cause irritation to the skin.

DISCUSSION

Wounds closed with tape have a lower rate of infection than those sutured or stapled (1, 4, 5). In the patients we treated, three wound infections were attributed to potentially infected wounds rather than to the use of paper tape to close the wounds. Nevertheless, many surgeons believe that adhesive tapes, unlike traditional sutures to pass through the subcutaneous tissue, would result in a dead space and subcutaneous hematoma as well as predispose to wound infection. Closure of subcutaneous tissue by an absorbable suture is commonly practiced by certain surgeons. However, it has been demonstrated that suture closure of adipose subcutaneous tissue potentiates the development of wound infection (6). If hemostasis has been cautiously performed, the incidence of subcutaneous hematoma decreases. Suture closure of subcutaneous tissue is not necessary for the wounds closed by paper tape.

Failure to appose the edges of the wound satisfactorily has also been a criticism of some surgeons. We did not have any difficulties in approximating the edges of the wound, even in obese patients. Pressure applied on both sides of the wound would help to appose the wound. Wounds closed by paper tape have better cosmetic results than those closed by sutures or staples since there are no puncture scars.

An ideal surgical tape used to close the wound should have adequate adhesive and supporting strength. Paper tape has the advantages equal to, or better than, the other adhesive tapes. It

is versatile, easy to use and less expensive than special backing tapes. We believe that paper tape is a good material to close abdominal wounds.

SUMMARY

Wounds closed by adhesive tapes have less inflammatory reaction, a lower rate of wound infection, greater tensile strength and better cosmetic results than sutured or stapled wounds. Special backing tapes, such as Steri-Strip, have been reported to have satisfactory results in closing laparotomy wounds. However, they are more expensive than paper tape. Sterile paper tape had adequate adhesive and supporting strength in the closure of abdominal wounds. The wounds closed with paper tape healed well and had satisfactory cosmetic results. Paper tape is a nonexpensive and convenient alternative to close abdominal wounds.

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