# Use of 3M™ Tegaderm™ Absorbent Clear Acrylic Dressing on Surgical Incision Wounds

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# Introduction

An essential component of a successful surgical incision wound treatment plan is selection of the proper dressing to provide a protective environment for healing. Numerous types and configurations of dressings are available to the health care professional to cover surgical incision wounds; however, gauze and tape remains the standard of care for many surgeons.

In spite of its popularity among surgeons, gauze and tape falls short of being the ideal post-surgical incision wound dressing. Gauze has limited absorptive capacity for wounds that are draining, it provides only limited protection from trauma and secondary infection, it allows drying and desiccation of the wound, it must be removed to monitor the surgical site for complications, and it can adhere to the wound causing trauma and pain during removal.

Few published studies have compared dressing types for use as a surgical site cover dressing. In an observational study, Hulten (1994) evaluated 340 patients that underwent colorectal surgery and creation of a nearby stoma.[1] When the surgical incision wounds were dressed with a standard hydrocolloid dressing rather than with traditional gauze and tape, the dressings remained adherent until suture removal in 89% of the patients studied. The patients involved in the study appreciated being able to shower and move around freely without worry of the sutures adhering to their clothing. The medical and nursing staff also appreciated the value of the extended wear time, as they did not need to continuously replace the dressing. Furthermore, only 8% of the patients developed a wound infection, which was well below the 10.0% to 15.0% rate of infection reported for major colorectal surgical procedures. Other studies have also reported the rate of wound infections is not increased with the use of occlusive or semi-occlusive dressings as surgical incision wound dressings,[2-4] these dressings may actually reduce the risk of infection by helping to seal out moisture, body effluents, and contaminants. One problem noted with the hydrocolloid dressing was that the sutures often became embedded in the hydrocolloid material, making removal of the dressing prior to suture removal problematic.

In another study, Allen (1994) systematically evaluated 100 sternal incision wounds dressed with gauze and tape following elective cardiac surgery.[5] The author concluded that rather than benefiting the patient, the gauze and tape could actually increase the risk of infection due to wounds gaping across the edge at certain points, lengthen healing time by not providing a moist healing environment, and by adhering to the wound surface and pulling away epithelialized tissue when removed.

As a result of this observational study, the author conducted a second comparative study on 152 patients to find a more suitable replacement dressing. Three dressing types were evaluated, including a thin hydrocolloid dressing, a polyurethane film dressing, and a composite dressing. Results favored the composite dressing, as it was able to handle more exudate, which resulted in longer wear time than either the thin hydrocolloid or the polyurethane film dressing. This study demonstrated five important features that a surgical incision wound dressing should possess: 1) The dressing should provide a moist healing environment, which may reduce the risk of infection by allowing for more rapid healing times, 2) The dressing should be absorbent enough to provide extended wear time, preferably up to 4 days post-surgery, 3) The dressing should be waterproof, allowing the patient to shower with the dressing in place, 4) The dressing should not stick to the wound, minimizing trauma upon removal, and 5) The dressing should be comfortable during wear and at removal.

3M™ Tegaderm™ Absorbent Clear Acrylic Dressing (Tegaderm Absorbent dressing) is a relatively new dressing type. Tegaderm Absorbent addresses the shortcomings of traditional gauze and tape for use as a surgical incision wound dressing, while improving upon the positive features of transparent film, hydrocolloid, and composite dressings. The dressing has four main attributes that make it an ideal choice for use in covering surgical incision wounds.

- Tegaderm Absorbent dressing is made with a unique highly absorbent transparent acrylic polymer sandwiched between two layers of polyurethane film. This construction helps manage drainage without adhering to the wound or allowing the sutures to become embedded in the absorbent material.
- Tegaderm Absorbent dressing is semi-permeable. It seals out moisture, body effluents and contaminants, but allows passage of moisture vapor. This feature helps maintain a moist healing environment, while increasing the total fluid handling capacity of the dressing and minimizing the risk of periwound skin maceration.
- Tegaderm Absorbent dressing is highly conformable to body contours. This feature allows for application to difficult anatomical locations and improves upon patient comfort.
- Tegaderm Absorbent dressing is transparent, which allows for wound monitoring without dressing removal.

## Objective

The objective of this study was to evaluate the performance of Tegaderm Absorbent dressing on clean, closed, approximated surgical incision wounds and laparoscopic incision wounds resulting from open gastric bypass surgery or laparoscopic gastric bypass surgery.

## Methods

**Study Design:** This was a single-site, prospective, open-label, non-randomized clinical trial of Tegaderm Absorbent dressing on clean, closed, approximated surgical incision wounds and laparoscopic incision wounds resulting from open gastric bypass surgery or laparoscopic gastric bypass surgery. Twenty patients were included in the study; ten patients completed Laparoscopic Gastric Bypass Surgery (LGBS) and ten patients completed Open Gastric Bypass Surgery (OGBS).

The LGBS incisions were closed with subcuticular sutures and 3M™ Steri-Strip™ Adhesive Skin Closures and the OGBS incisions were closed with surgical staples. Tegaderm Absorbent dressing was used to cover the closed surgical incision wounds. All dressings were removed prior to discharge or by post-op day 3, whichever was first. Dressing performance was assessed using a standardized assessment tool. With the exception of dressing residue on the skin, odor and the overall value of transparency of the dressing, all assessments utilized a five-point scale consisting of: Very Good, Good, Acceptable, Poor or Very Poor. Dressing residue was assessed on a five-point scale consisting of: None, Little, Acceptable, Much or Excessive. Odor was assessed on a four-point scale of: None, Little, Strong, or Very Strong. The overall value of transparency was assessed on a five-point scale consisting of: Very High, High, Moderate, Low and Very Low.

**Study Dressings:** Multiple sizes and configurations of Tegaderm™ Absorbent dressing were available to the investigators. The investigators selected the appropriate size/configuration for each surgical incision wound.

**Data Analysis:** The data were analyzed with descriptive statistics. For the categorical variables, which included gender and all of the assessments made with the standard assessment tool, the total number of responses for each category and the percent of the total number of responses are provided. For the continuous variables of age, height and weight, the mean and range of responses are provided.

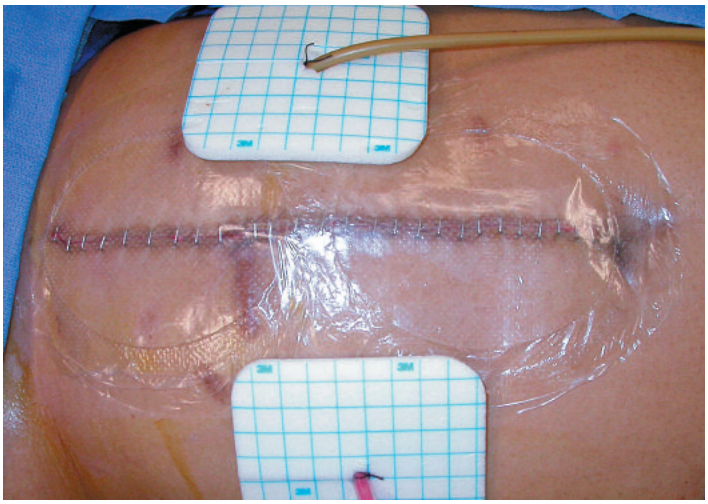
## Results

**Patient Demographics:** A total of 20 patients were enrolled into this study, 10 in the OGBS group and 10 in the LGBS group. In the OGBS group, nine patients (90%) had one large incision wound and one patient (10%) had one large and one smaller incision wound. All of the LGBS patients had five small incision wounds. Sixteen (80%) of the patients enrolled into the study were female and four (20%) were male. The mean (range) age was 43.1 (22–57) years. The mean (range) height was 64.2 (58–68) inches. The mean (range) weight was 255.5 (195–348) pounds.

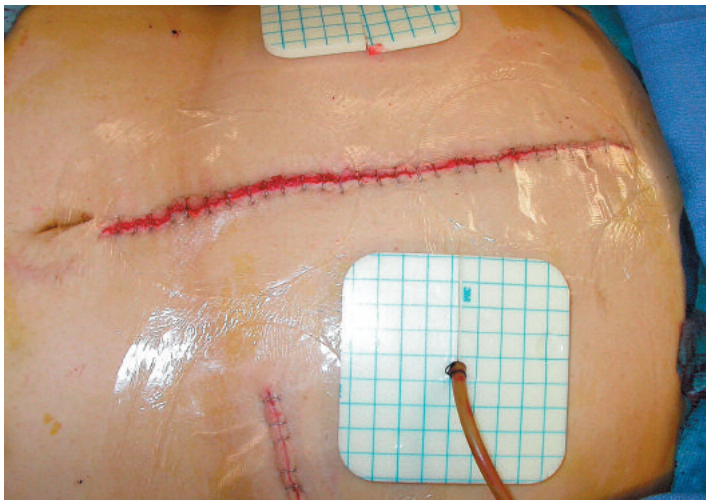
**Dressing Performance:** Results of the individual dressing performance assessments are summarized in Table 1 (at application), Table 2 (pre-removal) and Table 3 (during removal). For both the LBGS and OGBS groups, one patient in each of the groups was unavailable for the follow-up assessments (Tables 2 and 3). Dressing performance assessments were highly skewed toward the favorable responses, indicating that the dressing met or exceeded investigator expectations. These results are corroborated by the very high Overall Clinician Satisfaction scores (Figure 1) and the Overall Value of Transparency scores (Figure 2).

# Case Studies

Patient #002 was a 51 year old female that underwent OGBS. She weighed 222 lbs and height was 64 inches. A single midline incision was made to the abdominal cavity. The surgical incision was closed with staples and covered with two large oval Tegaderm Absorbent dressings. All dressings remained in place until patient discharge on post-op day 3. There were no infections, complications or adverse events.



*Patient 002*



*Patient 010*

Patient #010 was a 53 year old female that underwent OGBS. She weighed 279 lbs and height was 67 inches. Two incisions were made to the midline and lower left abdominal cavity. Both incisions were closed with staples and covered with multiple large oval Tegaderm Absorbent dressings. All dressings remained in place until patient discharge on post-op day 3. There were no infections, complications or adverse events.

# Conclusions

The transparent absorbent dressing was easy to use, showed excellent performance, and was well accepted by the surgeons and patients involved in the study. The dressings were comfortable to wear and to remove, provided good barrier/protective properties, and there were no product related adverse events reported. These results indicate that the dressing may be an appropriate choice for clean, closed, approximated surgical incision wounds and laparoscopic incision wounds, and that further study of other types of surgical incision wounds is warranted.

## Table 1: Dressing Assessments At Application

| Parameter | Application Dressing Assessment | Laparoscopic Gastric Bypass (n=50) | | Open Gastric Bypass (n=11) | |
|---|---|---|---|---|---|
| **Ability to Assess Wound Through Dressing** | *Very Good* | 50 | (100%) | 11 | (100%) |
| | *Good* | 0 | (0%) | 0 | (0%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Conformability** | *Very Good* | 50 | (100%) | 11 | (100%) |
| | *Good* | 0 | (0%) | 0 | (0%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Ease of Application** | *Very Good* | 50 | (100%) | 10 | (91%) |
| | *Good* | 0 | (0%) | 1 | (9%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |

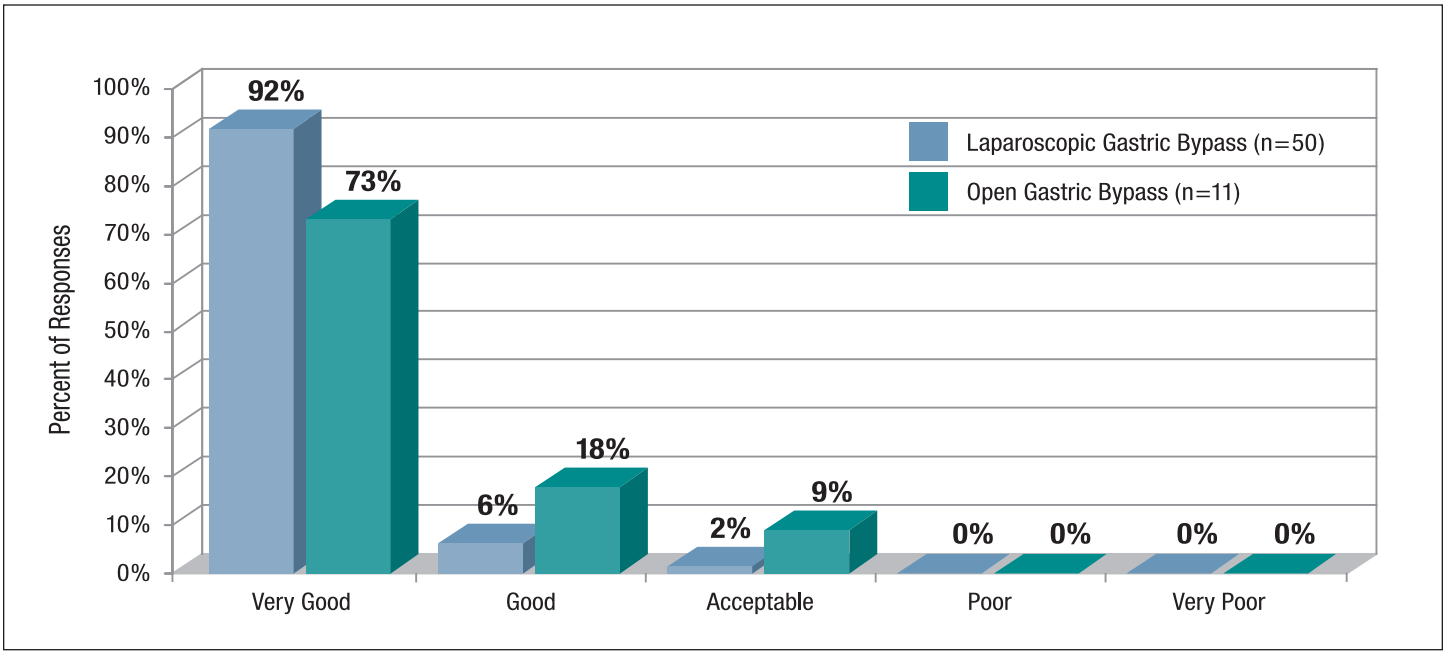
## Table 2: Pre-removal Dressing Assessments At Follow-up Visit

| Parameter | Pre-removal Dressing Assessment | Laparascopic Gastric Bypass (n=50) | | Open Gastric Bypass (n=11) | |
|---|---|---|---|---|---|
| **Absorbency** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 45 | (90%) | 6 | (55%) |
| | *Good* | 3 | (6%) | 4 | (36%) |
| | *Acceptable* | 1 | (2%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Adhesion** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 47 | (94%) | 7 | (64%) |
| | *Good* | 1 | (2%) | 2 | (18%) |
| | *Acceptable* | 0 | (0%) | 1 | (9%) |
| | *Poor* | 1 | (2%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Assess Wound Through Dressing** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 44 | (88%) | 10 | (91%) |
| | *Good* | 4 | (8%) | 0 | (0%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 1 | (2%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Barrier Properties** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 48 | (96%) | 8 | (73%) |
| | *Good* | 0 | (0%) | 2 | (18%) |
| | *Acceptable* | 1 | (2%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Patient Comfort** | *No Dressing In Place* | 0 | (0%) | 1 | (9%) |
| | *Very Good* | 45 | (90%) | 8 | (73%) |
| | *Good* | 5 | (10%) | 2 | (18%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Wear Time** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 48 | (96%) | 7 | (64%) |
| | *Good* | 0 | (0%) | 3 | (27%) |
| | *Acceptable* | 1 | (2%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |

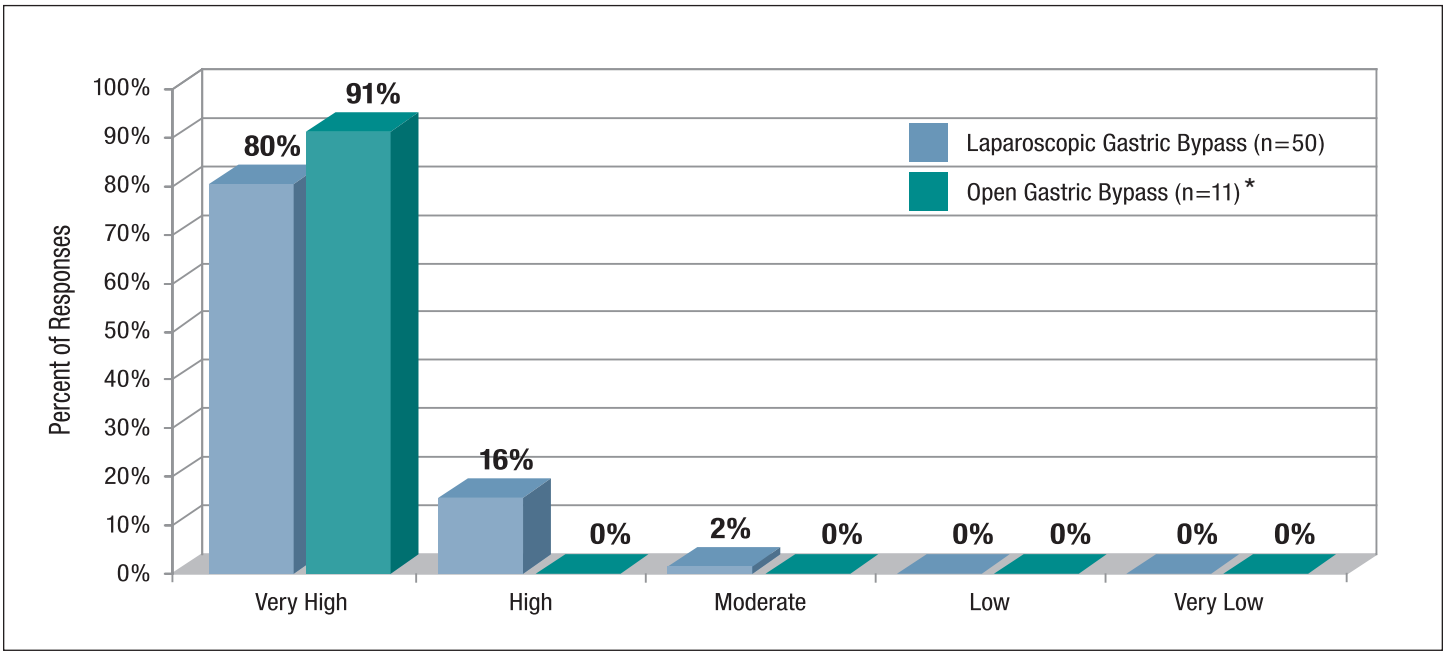
## Table 3: Removal Dressing Assessments At Follow-up Visit

| Parameter | During Removal Dressing Assessment | Laparoscopic Gastric Bypass (n=50) | | Open Gastric Bypass (n=11) | |
|---|---|---|---|---|---|
| **Dressing Residue On Skin** | *No Residue* | 44 | (88%) | 9 | (82%) |
| | *Little Residue* | 6 | (12%) | 1 | (9%) |
| | *Acceptable Residue* | 0 | (0%) | 0 | (0%) |
| | *Much Residue* | 0 | (0%) | 0 | (0%) |
| | *Excessive Residue* | 0 | (0%) | 0 | (0%) |
| | *N/A* | 0 | (0%) | 1 | (9%) |
| **Ease Of Removal** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 48 | (96%) | 9 | (82%) |
| | *Good* | 1 | (2%) | 1 | (9%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Non-adherence To Wound** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 45 | (90%) | 9 | (82%) |
| | *Good* | 4 | (8%) | 1 | (9%) |
| | *Acceptable* | 0 | (0%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |
| **Odor** | *None* | 50 | (100%) | 9 | (82%) |
| | *Little* | 0 | (0%) | 1 | (9%) |
| | *Strong* | 0 | (0%) | 0 | (0%) |
| | *Very Strong* | 0 | (0%) | 0 | (0%) |
| | *N/A* | 0 | (0%) | 1 | (9%) |
| **Patient Comfort During Removal** | *No Dressing In Place* | 1 | (2%) | 1 | (9%) |
| | *Very Good* | 43 | (86%) | 8 | (73%) |
| | *Good* | 5 | (10%) | 2 | (18%) |
| | *Acceptable* | 1 | (2%) | 0 | (0%) |
| | *Poor* | 0 | (0%) | 0 | (0%) |
| | *Very Poor* | 0 | (0%) | 0 | (0%) |

## Figure 1: Overall Clinician Satisfaction




## Figure 2: Overall Value of Transparency




* Response not available for one patient.

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