

Superficial surgical site infections in damage control laparotomy

Multicenter Study proposal is: prospective

Use this area to briefly (1-2 paragraphs only) outline the burden of the problem to be examined

Previous studies have demonstrated that patients undergoing damage control laparotomies are at high risk of surgical site infections; however, many of these infections are organ space infections and not superficial surgical infections. Due to this concern for surgical site infections after damage control laparotomies, many institutions keep skin incisions open after closure of the fascia or place negative wound pressured therapy over closed incisions to prevent surgical site infection.

At our institution we performed a retrospective review of a prospectively maintained damage control laparotomy database for all patients who underwent DCL from 2016 to 2018. Out of the 107 patients included in this study, there were only 4 superficial surgical site infections and 14 surgical site occurrences. Patients with wound classifications of dirty and contaminated were closed with wicks in place. Our data suggests that primary closure of incisions after damage control laparotomies are feasible with acceptably low superficial surgical infection rates.

Primary Aim

To determine the rate of superficial surgical infections after closure of wounds after damage control laparotomy with wicks in place.

Secondary Aims

To determine the rate of surgical site occurrences after closure of wounds after damage control laparotomy with wicks in place.

To determine if antibiotic irrigation decreases the incidence of superficial surgical site infections after damage control laparotomy.

To determine if antibiotic irrigation decreases the incidence of surgical site infections after damage control laparotomy.

Inclusion Criteria

Patients 18 years or older
Patient who underwent a damage control laparotomy
Patients who have their fascia closed
Patients who have their wound closed with wicks in place

Exclusion Criteria

Prisoners
Patients under the age of 18
Patients who fascia was not closed during their hospitalization
Patients who die within seven days of their fascia being closed

Therapeutic Interventions

Closing of skin and placement of wicks or incisional negative pressure device
Giving antibiotic irrigation prior to closure

Primary Outcome

The rate of superficial surgical infections after primary closure of wounds after damage control laparotomy with wicks in place or an incisional negative pressure device

Secondary Outcomes

The rate of surgical site occurrences after closure of wounds after damage control laparotomy with wicks in place.

The rate of superficial surgical site infections after damage control laparotomy in patients undergoing antibiotic irrigation prior to closure.

The rate of surgical site infections after damage control laparotomy in patients undergoing antibiotic irrigation prior to closure.

List specific variables to be collected & analyzed

Gender
Age
BMI

Comorbidities
Days until closure
Mechanism of initial presentation (blunt, penetrating or acute care)
Wound classification
Ostomy present at closure
Appropriate dosing or IV perioperative antibiotics according to SCIP guidelines
Antibiotic washout of wound prior to closure
Type of antibiotics
Superficial surgical site infections
Deep space infections
Organ space infections
Surgical site occurrences (Seromas, hematomas, skin dehiscence, fascial dehiscence, enterocutaneous fistulas)
Procedure interventions to treat infection (none, wound opening, wound debridement, percutaneous drainage)
Mortality
Mortality within 7 days of closure

Outline the data collection plan and statistical analysis plan succinctly

The data will be collected using RedCap Database.

Data will be analyzed using Fisher's exact tests and Wilcoxon-Mann-Whitney tests, with a significance set of a $p < 0.05$.

Outline consent procedures here, if applicable

Will ask for a waiver of consent. Closure of dirty/contaminated wounds with wicks or primary closure and negative pressure device is an acceptable treatment practice. This will be an observational study. Surgeons will treat their patients based upon their own judgement.

Succinctly outline a risk/benefit analysis

This is an observational study. The biggest risk of this study is concerning the security of protected health information. All data uploaded to the redcap database to be analyzed will be deidentified.

The results of this study may convince surgeons to primarily close more incisions after damage control laparotomy. This will decrease healing time of these wounds, the cost of negative wound pressure therapy, and possible need for home health. It may also theoretically reduce hernia rates and rates of enterocutaneous fistulas after damage control laparotomy and improve patient satisfaction.

Include a brief listing of key references

1. Pommerening MJ, Kao LS, Sowards KJ, Wade CE. Primary skin closure after damage control laparotomy. *Br J Surg.* 2015 Jan;102(1):67-75.
2. Frazee R, Manning A, Abernathy S, Isbell C, Isbell T, Kurek S, Regner J, Smith R, Papaconstantinou, H. Open vs Closed Negative Pressure Wound Therapy for Contaminated and Dirty Surgical Wounds: A Prospective Randomized Comparison. April 2018; 226(4):507-512.
3. He J, Zosa B, Schechtman D, Brajcich B, Savakus J, Wojahn A, Wang D, Claridge J. Leaving the skin incision open may not be as beneficial as we have been taught. *Surgical Infections.* November 2017; 18
4. Kilpatrick MA, McKee JL, LaPorta AJ, McBeth PB, Ball CG. Abbreviated closure for remote damage control laparotomy in extreme environments: A randomized trial of sutures versus wound clamps comparing terrestrial and weightless conditions. *The American Journal of Surgery.* 2017. 213:862-869.