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Jeray, Petrisor, Devereaux, Heels-Ansdell, Schemitsch, Anglen, Rocca, Jones, Kreder, Liew, McKay, Papp, Sancheti, Sprague, Stone, Sun, Tanner, Tornetta, Tufescu, Walter, Guyatt(2015). A Trial of Wound Irrigation in the Initial Management of Open Fracture Wounds. *New England Journal of Medicine* 373(27) 2629-2641.

Question:

In initial management of open fractures is there any difference in re-operative rates between high/low pressure irrigation in patients requiring surgical fixation? Does the irrigation solution chosen affect re-operative rates in open fractures?

Introduction:

Patients presenting to the Emergency Department with open fractures need prompt wound irrigation. Should the wound be irrigated with a high or low flow rate? Is there any benefit between using normal saline for irrigation opposed to using a solution with an additive cleansing agent? Although wound irrigation is well understood, there is little guidance regarding the optimum volume, pressure, and components required for irrigation to prevent infection.

Methods:

This study used a 2-by-3 factorial design. The study utilized 41 medical centers in the US, Canada, Australia, Norway, and India. Patients included in the study were those with an open fracture of an extremity requiring operative fixation. Patients under 18 years old were excluded from this study. Patients were randomly assigned to treatment groups: high flow irrigation (>20 psi), moderate flow irrigation (5-10 psi), low pressure (1-2 psi), normal saline irrigation, castile soap irrigation. Primary endpoint was re-operative management within 12 months after initial fixation.

Results:

A total of 2,551 patients underwent randomization, 2,447 were included in the study. Re-operative rate in the high pressure group was 13.2%, the moderate pressure irrigation group had re-operative rate of 12.7%, and the low pressure group had a re-operative rate of 13.7%. Re-operative rate for the soap group were 14.8% and re-operative rate for the saline group was 11.6%

Discussion:

There was no significant difference between the high/moderate/low pressure irrigation groups. This suggests that using any easily accessible irrigation method is probably acceptable for the irrigation of open fractures. There was a significant difference in the re-operative rates for the groups using soap cleansing versus normal saline. Prior randomized studies have shown improved results with high pressure irrigation, but this study appears to contradict these results. The application of this study to the ED population suggests that using normal saline for irrigation likely has improved patient outcomes, and that low pressure methods of irrigation are likely as beneficial as more expensive/complicated high pressure irrigation methods.
