

## Primary Closure of External Fixator Pin Sites Does Not Increase the Incidence of Surgical Site Infection

Jeffery Shroff, MD; Steven Karnyski, MD; Brittany Haws, MD; James D. Brodell, BA; Sandeep Soin, MD; Kyle T. Judd, MD; Gillian Soles, MD; Catherine A. Humphrey, MD, MBA; John T. Gorczyca MD; John P. Ketz, MD  
University of Rochester, Rochester, NY, United States

**Purpose:** Provisional external fixation is a commonly employed treatment strategy in the management of traumatic orthopaedic injuries. There are little data to guide the management of pin site wounds following removal. The purpose of this study was to compare the rates of infection of pin site wounds managed with curettage, debridement, and primary closure versus those allowed to heal secondarily. We hypothesized that there would be no difference in rates of infection between the two groups.

**Methods:** Patients who had received a lower extremity external fixator for trauma between 2010 and 2016 were reviewed. Demographics, injury characteristics, and medical history were collected. Patients were placed into cohorts based on whether their pin site wounds were closed primarily or allowed to heal by secondary intention. Primarily closed pin sites were treated with curettage, irrigation, and debridement prior to closure. The primary outcome was the incidence of deep or superficial infection involving the pin site wounds following removal of the external fixator. Development of a surgical site infection (SSI) was a secondary outcome measure. A pin site infection was defined as erythema and drainage from the pin site necessitating antibiotics after the external fixator was removed. An SSI was an infection at the site of the fracture after definitive fixation.

**Results:** A total of 216 patients were evaluated, representing 92 in the primary closure group and 124 in the secondary closure groups. The groups were similar regarding age, sex, body mass index, and medical comorbidities. There was no difference between the groups regarding the incidence and grade of open fracture ( $P = 0.55$ ). There was no difference in duration of external fixation between the primary group ( $11.7 \pm 8.5$  days) and secondary group ( $13.5 \pm 8.0$  days,  $P < 0.01$ ). The infection rate of the pin site wounds following external fixator removal was significantly higher in the secondary closure group (10, 8.1%) than the primary closure group (0, 0.0%;  $P < 0.01$ ). There was a trend toward increased SSI in the secondary closure group; however, this was not significant ( $P = 0.16$ ).

**Conclusion:** Traditionally, pin sites have been left open to close secondarily. However, we identified a significant reduction in pin site infections after primary closure. There was also a trend toward decreased SSI after primary external fixator pin site closure, although this was not significant. Our study suggests that there may be a benefit to debriding and closing pin sites primarily.