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Pediatric Femur Fracture Flexible Nailing: Predicting Need for Open Reduction

 Saturday, October 26  3:24 PM - 3:30 PM

 Location: Ernest N. Morial Convention Center, 238-239

Purpose: Flexible Intramedullary Nailing (FIN) is commonly utilized to treat pediatric femur fractures. Prolonged attempts at closed reduction increase surgical time, amount of anesthesia/fluoroscopy, and damage to the soft tissues. The aim of this study was to determine preoperative factors associated with failed closed reduction. We hypothesized that fracture, patient, and surgeon characteristics would impact the need for open reduction. **Methods:** Retrospective review of pediatric femur fractures treated with flexible nails in a single tertiary pediatric hospital from 2013-2017. Patients for which flexible nailing was performed as a secondary intervention and patients who had open biopsy prior to nailing were excluded. Patient, fracture, and surgeon dependent variables were assessed between the open reduction and flexible nailing (OR group) versus closed reduction and flexible nailing (CR group). **Results:** 87 patients met inclusion criteria. 14 patients failed closed reduction, necessitating open reduction, flexible nailing. Distal third femur fractures were more likely to require open reduction ($p=0.017$). High energy injuries were associated with need for open reduction ($p=0.002$) as was initial displacement on the AP femur radiograph ($p=0.022$). Surgery time was found to be longer in the open reduction group ($p=0.019$). Presence of associated injury, fracture classification, BMI, and surgeon years in practice were not associated with failed closed reduction. **Conclusion:** Operating room time was greater in cases requiring open reduction ($p=0.019$). Distal 1/3 femur fractures ($p=0.017$), high energy mechanisms ($p=0.002$), and initial displacement on AP radiographs ($p=0.022$) were associated with open reduction. We hypothesized that larger patients, fracture classification, and less experienced surgeons would be associated with increased rates of open reductions, however no such trends were found in our data. Prolonged attempts at closed reduction may have led to longer surgical time in the open reduction group.

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Intraoperative Burden of Flexible Intramedullary Nailing and Spica Casting in Young Children

 Saturday, October 26  3:18 PM - 3:24 PM

 Location: Ernest N. Morial Convention Center, 238-239

Purpose: While immediate spica casting remains the standard of care for femur fractures in young children, flexible intramedullary nailing has become increasingly utilized as a surgical option for this age group. The purpose of this study was to compare the intraoperative burden (time of surgery, fluoroscopy time, and radiation load) of immediate spica casting and flexible intramedullary nailing. We hypothesized that the intraoperative burden would be greater in children treated with flexible intramedullary nails compared to spica casting. **Methods:** Consecutive patients (ages 2-6) who met inclusion criteria and were treated for femoral shaft fractures with spica casting (Spica) or flexible intramedullary nailing (FIN) from 2012 to 2017 were reviewed. Time of surgery, fluoroscopic duration, and radiation load were evaluated. Length of hospital stay, mechanism of injury, and complications were also recorded and compared between the two groups. Student t-tests and Fisher exact test were performed to identify differences between the two groups. **Results:** 143 patients were included: 91 patients were treated with immediate Spica and 52 were treated with FIN. Complication rate was comparable between groups (Spica 42% vs. FIN 31.5%). Patients who were managed with FIN were significantly more likely to have experienced high energy trauma compared to the Spica group (34.6% vs. 16.5%). Average surgical time was significantly longer in the FIN group (90.7 min) compared to the Spica group (45.1 min). Average fluoroscopic duration was 15.4 seconds in the Spica group and 131.6 seconds in the FIN group. Average radiation load, measured in milligrays (mGy) was 1.6 mGy in the Spica group and 6.9 mGy in the FIN group. Length of hospital stay and number of follow-up visits did not differ between the two groups. **Conclusion:** Our findings suggest that treatment of femoral shaft fractures with FIN is associated with higher levels of intraoperative burden compared to spica casting. While complication rates were similar for both groups, spica casting reduced both radiographic exposure and surgical time compared to FIN. Immediate spica casting for femoral shaft fractures continues to be effective while reducing the overall intraoperative burden on patients in this age group.

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