

Incidence and Risk Factors for Complications of Exposed Kirschner Wires Following Elective Forefoot Surgery

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Introduction/Purpose: Kirschner wires (K-wires) are commonly utilized for temporary metatarsal and phalangeal fixation following forefoot corrective osteotomies. K-wires can remain in place for up to 6 weeks postoperatively and are at risk for wound complications. Their exposure to the outside environment and direct osseous communication makes infection an important concern for the clinician. Early removal, prophylactic antibiotics, and re-operation are potential sequelae of infected K-wires and can affect outcomes. The purpose of this study is to evaluate the incidence of complications of exposed K-wires after forefoot surgery and identify patient or perioperative risk factors for these complications.

Methods: A single surgeon retrospective chart review of forefoot surgeries over the past 10 years was undertaken. Inclusion criteria were any adult undergoing elective forefoot surgery with the use of exposed K-wires. Incidence of wound complication defined as cellulitis, pin site drainage, or migration/loosening of the pin requiring prophylactic antibiotics or early removal was noted. Patient demographic data such as age, BMI, comorbidities, and smoking status were recorded. Perioperative data such as tourniquet time, type of anesthesia, and perioperative antibiotics was also recorded. Univariate analysis was performed via Mann-Whitney test for continuous variables and Chi square test for categorical variables. Multivariate analysis was performed for statistically significant risk factors.

Results: 1,217 Patients (2,018 K-wires) were analyzed. There was a 10% complication rate requiring prophylactic antibiotics or early removal (N=123). 40 patients required early pin removal, 54 patients were given oral antibiotics, and 29 patients required both. Female gender ($p<0.001$), BMI over 28 ($p<0.001$), general anesthesia ($p=0.025$), increased tourniquet time ($p=0.003$) and history of rheumatoid arthritis ($p=0.047$) were significantly associated with complications. Both male gender [OR 2.62] and tourniquet time [OR 1.01] remained significant on multivariate regression analysis. There was no increased risk of complications with a history of smoking or diabetes.

Conclusion: The K-wire is an important modality for providing temporary immobilization of the smaller bones of the forefoot following deformity correction. Male gender, elevated BMI, history of rheumatoid arthritis, general anesthesia, and longer tourniquet time are associated with increased risk of pin infection requiring early removal and/or antibiotics. Further study is needed to determine whether optimizing inflammatory disease, using efficient perioperative technique, and utilizing local anesthesia may limit the risk of wound complications with K-wires in forefoot surgery.