Use of a Washer Does Not Affect the Rate of Implant Removal or Elbow Motion After Fixation of Medial Epicondyle Fractures

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BACKGROUND
• Many controversies surround the evaluation and treatment of medial epicondyle fractures in children.
• Use of a washer to supplement screw fixation can prevent fragmentation and penetration during the fixation of medial epicondyle fractures.
• However, concerns may arise regarding screw prominence and the need for subsequent implant removal.
• The purpose of this study is to evaluate the impact of washer utilization on the need for hardware removal and elbow range of motion (ROM).

METHODS
• All surgically-treated pediatric medial epicondyle fractures with a single screw over a 7-year period were queried for this retrospective case-control study.
• Implant removal was performed only if the patient experienced a complication or implant-related symptoms that were refractory to non-operative management.
• Full ROM was considered flexion beyond 130 degrees and less than a 10-degree loss of extension.
• Univariate analysis was followed by Kaplan-Meier (one minus survival) analysis to evaluate the time until full ROM was regained. Curves between patients with and without a washer were compared with a log rank test.

RESULTS
• 137 patients were included (Table 1). 54% received a 4.0 mm cannulated screw and all others received a 4.5 mm cannulated screw.
• 31 patients (23%) required implant removal.
• There was not an increased rate of screw removal in patients with a washer (p=0.11, Table 2).
• The mean BMI of patients that underwent hardware removal (19.1±2.5) was similar to that of children who did not (20.4±3.5, p=0.06).
• In athletes (n=102): There was no difference in removal rate if a washer was used (p=0.64).
• 107 patients (78%) regained full ROM at a mean of 13.9±9.7 weeks after surgery (Figure 1).
• There was no difference in the rate of patients achieving full ROM or the mean time to full ROM in those with and without a washer (p=0.46 and 0.21, respectively).

DISCUSSION
• A washer may distribute compressive forces over a larger surface area, but concerns of hardware prominence may discourage surgeons from utilizing a washer in some situations.
• Pace and Hennrikus (2017): 17 patients, of which 58% with a washer required hardware removal vs. 0% of those without.
• Of note, only 5/17 were treated without a washer.
• 16/17 were competitive athletes.
• These differences were not found in the present study (n=137).

CONCLUSION
• Use of a washer did not affect
  • The rate of implant removal
  • Likelihood of achieving full ROM
  • Time required to achieve full ROM
• These results held true in subgroup analysis of
  • Competitive athletes
  • Thinner (lower BMI) patients

REFERENCES

FIGURE 1. Kaplan-Meier (1–survival) analysis. The mean time to full ROM was 85 days.