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KSES 2026

The 33rd Annual
International Congress of the
Korean Shoulder and
Elbow Society

March
27(Fri) ~ 28(Sat), 2026
BEXCO, Busan, Korea

- Abstract No. : F-0070
- Category : Shoulder
- Detail Category : trauma

Risk factors for reduction loss after hook plate fixation in distal clavicle fractures and acromioclavicular complex injuries

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Introduction and Background

Hook plate fixation is widely used for distal clavicle fractures (DCF) and acromioclavicular and coracoclavicular ligament (ACCC) injuries. Despite satisfactory initial reduction, loss of reduction after implant removal remains a frequent complication. This study aimed to identify risk factors associated with reduction loss after hook plate fixation in patients with DCF and ACCC injuries.

Material and Method

A retrospective review was performed on 206 patients who underwent hook plate fixation and subsequent implant removal between 2011 and 2024, including 70 DCF and 136 ACCC injury patients. Demographic, clinical, and radiologic variables were analyzed, including age, sex, injured site, BMI, interval from trauma to surgery, Interval from surgery to implant removal, and coracoclavicular (CC) distance and ratio at preoperative, postoperative, and implant removal period. Reduction loss was defined as CC ratio >30% or >50% after implant removal.

Results

In the DCF group, higher BMI was the only independent factor of severe reduction loss (>50%), whereas no risk factors were identified using the >30% reduction loss. In the ACCC injury group, CC widening after implant removal was more frequent. For the >30% reduction loss, older age, right-sided injury, greater preoperative and postoperative CC ratio differed significantly between groups. For the >50% reduction loss, postoperative CC ratio only showed differences between groups. Multivariable analysis showed that older age ($p = .010$, OR = 1.04), right-sided injury ($p = .056$, OR = 2.44), and greater preoperative CC ratio ($p = .006$, OR = 1.01) were independent predictors of reduction loss when defined as CC ratio greater than 30%.

Conclusions

While reduction is generally stable in DCF, ACCC injuries are more vulnerable to postoperative CC widening. Older age, right-sided injury, and greater preoperative CC ratio significantly increase the risk of reduction loss and should be considered during surgical planning and postoperative monitoring.

