

The Multiligament Knee Injury Classification Stratifies Patients into Risk Categories

Patrick Huang, Don Li BS, Logan Petitt, Jack Porrino MD, Michael Medvecky, Joseph Kahan

Choose a building block.

Objectives: Our goal was to characterize the precise ligamentous injury locations and patterns of acute multi-ligament knee injuries (MLKI) and determine associated rates of dislocations, fractures, peroneal nerve palsies, and vascular injuries.

Methods: All patients at a single level one trauma center who received operative treatment for MLKI between 2001 and 2019 were retrospectively identified. Demographic, injury mechanism, injury patterns, presence of dislocation, and associated injuries including vascular injury, peroneal nerve palsy, and fracture were assessed for each patient. MLKI both with and without a documented knee dislocation were classified into five classes based on pattern of ligamentous tear (Figure 1). Class 1 included unicruciate tear with any combination of collateral tear. Class 2 are a bicruciate tear without collateral involvement. Class 3 are bicruciate tears with either a medial or lateral sided tear. Class 4 are bicruciate tears with both medial and lateral sided tears. Class 5 are periarticular fracture with any of the preceding ligamentous injury patterns. Rates of dislocation, vascular injury and peroneal nerve injury were analyzed among each class. Single variable statistics such as t-tests as well as multivariable techniques such as Chi square and multiple regression analysis was performed to identify patterns of injury and to predict risk of associated injuries.

Results: 100 knees were identified as multiligament knee injuries. 34 of the knees (34%) were dislocated at presentation, and the remaining 66 (66%) did not have a documented knee dislocation. Patients with a documented knee dislocation had higher rates of vascular injury (24% vs. 3%, $p = 0.0148$), but not higher rates of peroneal nerve injury (32% vs. 20%, $p = 0.0863$). Patients with PLC injuries had statistically higher rates of peroneal nerve injury compared to acute multiligament knee injuries without a lateral sided injury (30% vs. 3%, $p = 0.005$). Rates of vascular injury between MLK Class are shown in Table 1. MLK Class was found to be predictive of vascular injury, but not of peroneal nerve injury.

Conclusion: We present a new classification of multiligament knee injuries with the goal of providing a more precise diagnosis to aid in the surgical planning and decision making as well as to enhance clinical outcomes research of these complicated injury patterns. By classifying these injuries into five separate classes and further subclassified based on presence of dislocation and lateral sided injury, we are better able to predict likelihood of neurovascular injury. We hope that understanding the risks associated with each class will allow physicians to better appreciate the likelihood of potential complications of these injuries.

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