

Abstract

This research studies biomechanics of ligament on knee. The purpose is to obtain mechanical behavior, stress and strain of knee ligament while walking. First, study anatomy of knee. Design and build mechanical tensile test machine for ligament. Test ligament to obtain mechanical properties, which are used for knee behavior simulation. Next, finite element model is constructed. The stress and strain in knee's ligament while walking are calculated from the simulation. The research output is one set of mechanical tensile test machine, ligament behavior and force while walking. The maximum stress and strain occur on a top of ligament while extend leg are 33.82 MPa and 0.16 mm/mm, respectively, for 1 Bundle. The maximum stress is 41.87 MPa and maximum strain is 0.18 mm/mm for 2 Bundles. The advantage is to understand the biomechanics of the knee ligaments while walking. And this research result can help patients who have an anterior cruciate ligaments (ACL) tear problem and be developed for further research about force and behaviors of the other ligament and muscle in body.