Efeci “A locking-compression device for kirshner-wire fixation”

Emre Karadeniz
Baskent University School of Medicine, Turkey

The aim of this device is to lock and compress the fracture fragments with kirschner-wires. The prototype of this device is cylinder shaped with 8mm radius and 5mm in length and there is a hole for insertion of 1.2mm k-wire. The device contains two pieces that catch each other with threads. The top piece functions as a cap. The second piece contains 3 gloves for the insertion of 3 balls. These balls are with 2.5mm radius and magnetic active.

The mechanism of locking is with the help of balls in the cone shaped gloves. (Figure.1) in forward movement, balls move back to the base of the cone. During pulling back, balls move to the narrow part of the cone and lock the k-wire. For the removal of these devices, balls are magnetic active and when a magnet applies to these devices, balls move back and release the k-wire.

• These device’s mean pull out strength was 920N (range: 837-1026N)
• Against cyclic loading these devices resist very well (100-cycle of 450N, no failure)
• These device’s resistance to compression forces at tibial plateau fracture simulation was 2509N (1706-2999N)
• These devices are biocompatible
• The next step will be clinical studies

For the treatment of fractures, these devices may be a new option. Furthermore, this new fixation technique would not only be a solution in orthopedic trauma surgery but also in sports medicine and chest surgery.

Biography

Emre Karadeniz earned his medical degree at the age of 24 years from Osmangazi University. He worked at the Turkish Ministry of Health, External Relations Department for 2 years. In 2008 he has completed his Orthopedics and Traumatology residency from Baskent University, Ankara. In 2010 he has completed his spine surgery fellowship from Hacettepe University, Ankara and Istanbul Spine Center, Istanbul. He is working at the Orthopedics and Traumatology Department of Baskent University in Istanbul, Turkey.

ekaradenizmd@yahoo.com