Legamenti artificiali oggi : Si o No ?
Artificial ligaments today : Yes or No ?

Nicolas Duval, MD, FRCSC
Why « gods » are soooo good?
Because...

They have superior neuromuscular performance

Reproduced from www.emory.edu/ANATOMY/AnatomyManual/nervous_system.html
Ligaments have neurosensorial properties

ACL = 1 - 2.5% of Neural tissues
Behavior of the knee with an ACL tear

Reduction of mechanical stability
• Develops Lachman sign, pivot shift
  – No correlation between KT-1000 and degree of subjective instability

Reduction of proprioceptive function
• Decrease in joint position sense and movement detection
  – Latency of the hamstrings contraction correlates with degree of subjective instability
Aim of ACL surgery

Reconstruction
• Restoration of mechanical stability
• May not restore proprioceptive function
• Potential for tendon graft donor-site complications

Repair
• Restoration of mechanical and sensory function
• General belief: ACL will not heal even if repaired
ACL ruptures can heal

Healing potential of ACL repair improves when augmented by artificial band

• Does not undergo the processes of necrosis and ligamentization
• Preservation of all structures…may also offer the possibility of preserving the proprioceptive function

Richter et al., J Mat Sci (1997)
Mechanoreceptors can survive

« In untreated anterior cruciate ligament lesions in humans, morphologically normal mechanoreceptors remained in the ligament for 3 months after the injury »

Denti et al., Clin Orthop (1994)
Type of synthetic augmentation

Biocompatibility & Structure
Surgical technique

Must support **HEALING OF SOFT TISSUES**
Surgical technique

Must support **HEALING OF ACL**
Artificial ligaments today: Yes
Thank you