Scott F Dye, Orthop Muscul Syst 2014, 3:2
http://dx.doi.org/10.4172/2161-0533.S1.016

OMICS Group Conferences
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3rd International Conference and Exhibition on
Orthopedics & Rheumatology
July 28-30, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

The prevention of early OA of the knee following meniscal or ACL surgery is possible by the achievement (& maintenance) of joint homeostasis

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Introduction: The human knee is an excellent model for the development of post-traumatic OA (PTOA) in the medial compartment following meniscal or ACL surgery. The current world-wide rates of PTOA 10 years after ACLR, for example, exceed 50%. This is an alarming statistic and reflects the failure of the current paradigm of orthopedic sports medicine which emphasizes the achievement of structural and kinematic normality. We have discovered, however, that early PTOA of the knee can actually be prevented by the achievement and maintenance of normality in another biological realm: Joint Homeostasis.

Methods: The development of Early PTOA was assessed in 19 ACLR and 74 partial medial menisectomy (PMM) patients ACLR (mean 12.3 years P/O) and PMM (mean 7.4 years P/O) by the use of multiple criteria, including radiographs (Rosenberg X-rays) and scintigraphs (Tc99m-MDP Bone Scans) in addition to the standard subjective and objective criteria (e.g. P/O laxity).

Results: Early PTOA was prevented if joint homeostasis was achieved and maintained (as in 89% of cases) proven by the presence of 3 criteria:

- Total clinical silences: No stiffness, no aching, no sense of instability - totally asymptomatic - the subjective correlate of Joint Homeostasis.
- A normal Tc bone scan: Proof of physiologic normality i.e. restoration of bone/tissue homeostasis - the objective,metabolic correlate of joint homeostasis.
- A normal Rosenberg X-Ray (Kellgren-Lawrence '0') proof of non-progression to early OA - the Objective structural correlate of joint homeostasis (long-term).

If these 3 criteria were met it did not matter, what other factors may have been present including: timing of surgery, degree of P/O laxity, "non-anatomic" position of the ACL graft, presence of grade 3 CMP, level of activity, partial menisectomy, overall alignment, age, sex, height and weight.

Discussion: By emphasizing the restoration of joint homeostasis of the knee as the primary clinical goal, rather than the achievement of structural or kinematic normality, an important P/O complication - PTOA- was averted following meniscal and ACLR surgery.

Conclusion: The achievement (& maintenance) of joint homeostasis is more important, clinically than the achievement of structural and kinematic normality in the prevention of early PTOA of the knee, and thus represents a new emergent paradigm in orthopedics and musculoskeletal medicine The implications for the possible prevention of early OA in joints other than the knee are vast.

Biography

Scott F Dye is an Associate Clinical Professor of Orthopedic Surgery at University of California San Francisco. He has completed his BA in Physical Anthropology at University of Pennsylvania in 1971, MD at University of Virginia in 1975 and Surgical Internship and Orthopedic residency at Letterman Army Medical Center, Presidio of San Francisco in 1975-1980. His research devoted to the knee and he developed the concept of knee as biologic transmission with an envelope of function. He discovered the internal neurosensory characteristics of the knee by having arthroscopy performed on himself without intra-articular anesthesia. He was awarded with European Traveling Sports Medicine Fellow in 1988

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