The Union of Emerging Techniques and Technologies in THA

By: John J. Keggi, MD[1]; Kristaps J. Keggi, MD[1]; Vineet K Sarin, PhD[2]; Edward J. Cheal, PhD[3]; Timothy McTighe[4]

Keggi Orthpaedic Foundation
1201 West Main Street
Waterbury, CT 06708
203-757-3855
www.keggiorthofoundation.org

(1) Department of Orthopaedics & Rehabilitation, Yale University School of Medicine, Keggi Orthopaedic Foundation, 1201 West Main St., Waterbury, CT 06708

KINAMED NAVIGATION SYSTEMS, LLC
820 Flynn Road,
Camarillo, CA 93012
www.kinamed.com

(2) R&D Director, Kinamed Inc, 820 Flynn Road, Camarillo, CA 93012

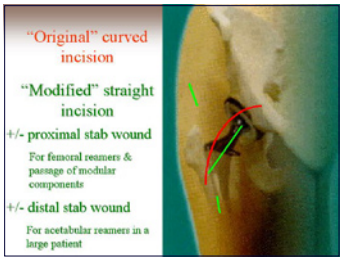
Apex Surgical™
12 Harding St.
Lakeville, MA 02347
www.apexsurgical.com

(3) Managing Director Apex Surgical, LLC, 12 Harding St., Lakeville, MA 02347

Joint Implant Surgery and Research Foundation
17321 Buckthorne Drive
Chagrin Falls, OH 44023
440-543-0347
www.jisrf.org

(4) Executive Director, Joint Implant Surgery & Research Foundation, 17321 Buckthorn Dr., Chagrin Falls, OH 44023

Introduction: Reduction of pain, restoration of joint mechanics and reduction of post-operative rehab are the primary goals of THA. Current trend of mini-surgical incisions offers some opportunities for reduced rehab time and cost, however, may increase risk as to implant malposition and possible dislocation. New emerging technologies of surgical navigation and proximal modular stem may demonstrate reliable and reproducible implant positioning with mini-surgical incisions.



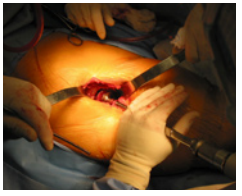
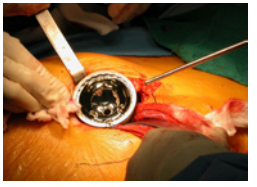
Anterior Mini-Incision

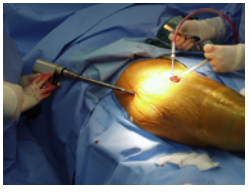

Apex™ Modular Cementless Stem

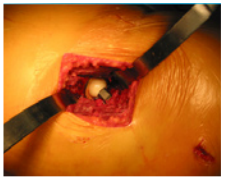

NaviPro™ Surgical Navigation System

Techniques & Technologies



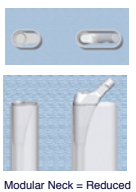



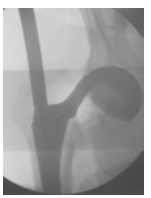




Discussion: Implant orientation is a significant part of total hip surgical technique. The mini-incision places a higher demand on awareness of implant positions. Proximal modular stems and surgical navigation provide for fine-tuning adjustments thus reducing the risk of implant impingement, leg length discrepancy and soft tissue laxity. The uniting of these technologies and designs aid the surgeon who is not familiar with the anterior mini-incision to be confident in their ability to routinely implant components in their proper biomechanical orientation.

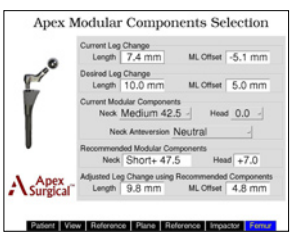
Proximal modular hip stem design aids in minimizing soft tissue trauma, obviating the need for posterior capsular and deep posterior blood vessal release, resulting in decreased blood loss.


Modular Neck = Reduced Profile = Smaller Incision




Poster Exhibit
September 2003

NaviPro™ is a image-free surgical navigation system that has been programed with the Apex Modular Cementless total hip system. Optical tracking devices are fixed to the pelvis and the femur prior to hip dislocation and data registered. Based on the surgeon's objectives for length and offset, the system is used to calculate the change in length and offset changes after trial reduction; compare these changes to the pre-operative objectives and recommend a different choice of modular components in order to best achieve the reconstructive objectives.



Conclusion: Surgical navigation and modular stems are not necessary to successfully perform THA using the anterior mini-incision approach. However, uniting these designs and technologies can provide for a more reproducible teaching system that increases the confidence of surgeons while they gain experience with this surgical approach. Furthermore, surgical navigation systems that are programmed with modular component sizing and availability can enhance and expedite the intra-operative decision-making process. By integrating these emerging technologies, the surgeon can efficiently evaluate the effect of component variability and choose the modular components that best achieve the reconstructive objectives.