The Union of Emerging Techniques and Technologies in THA

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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.

NaviPro™ is an image-free surgical navigation system that has been programmed 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, unifying 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.