Longevity of total hip arthroplasty (THA) is dependent upon avoiding both short- and long-term problems. One of the most common short-term / early complications of THA is instability while longer term issues of wear remain a concern. Both of these concerns appear to be related to implant position: either static or functional. While achieving “ideal” implant position in primary THA for osteoarthritis is only successful in 50% of cases (Callanan et al.), it is even more difficult in complex primary disorders such as dysplasia and post-traumatic arthritis.

Many theories exist as to why implant position and short-term complications appear to be higher in this “complex primary” cohort but certainly the ability to achieve desired implant position appears to be more challenging. The loss of usual anatomic landmarks, the presence of soft tissue contractures, and the recognition of both pelvic and femoral deformities play a role.

Enabling technologies have emerged to help in achieving improved implant position. These technologies include both navigation (both imageless and image guided) as well as the newly adopted technology of robotic assistance. Robot-assisted THA is based upon a CT scan protocol. Three-dimensional pre-operative planning on both the femoral and acetabular side can be performed. Precision guided bone preparation and exacting implant delivery is achievable using robotic technology.

Examples of use of this technology in complex primary THA will be demonstrated including planning, preparation and implantation.

References:
