Diagnosis-Driven Variations in Preoperative Imaging Utilization for Total Hip Arthroplasty: A Global Survey of Orthopaedic Surgeons

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INTRODUCTION:

Accurate diagnosis and preoperative planning are essential to optimize outcomes in total hip arthroplasty (THA). While standard radiographs remain the foundation of preoperative imaging, advanced modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) are increasingly used. This study aimed to assess how specific hip pathologies influence imaging choices among orthopaedic surgeons worldwide.

METHODS:

A digital survey was distributed to an international cohort of orthopaedic surgeons, presenting 20 standardized THA case scenarios. A total of 288 surgeons responded. Each scenario included a clinical history and standard radiographs (anteroposterior of the pelvis and cross-table lateral). Surgeons rated their likelihood (0–5 scale) of ordering additional imaging modalities (CT, MRI, spinopelvic mobility radiographs, and specialized radiographic views) and were asked to assess the perceived impact of CT imaging on diagnosis, implant choice, and surgical planning. Imaging trends were stratified by diagnosis to identify patterns in utilization.

RESULTS:

CT was the most ordered advanced imaging modality (mean likelihood score = 3.0 overall), particularly in cases involving Crowe III–IV dysplasia (3.7), acetabular or femoral hardware (4.2), and lumbosacral fusion (2.4) (Table 1). Spinopelvic mobility radiographs had the second-highest utilization (2.4 overall), followed by additional specialized radiographs (2.2 overall). However, MRIs (1.8), bone scans (1.2) and ultrasound (1.1) were rarely requested across all cases. Diagnosis-specific trends were observed: mild to moderate osteoarthritis rarely prompted further imaging, while complex cases demonstrated a higher likelihood of utilization (Figure 1). CT imaging was reported to significantly impact diagnosis (OR = 2.53, P = .0005), surgical plan (OR = 3.02, P < .0001), and implant choice (OR = 3.09, P < .0001).

DISCUSSION AND CONCLUSION:

Advanced imaging use in THA is highly diagnosis dependent. CT imaging was the modality of choice in complex cases. These findings support the development of diagnosis-specific imaging protocols to guide preoperative evaluation and promote value-based, resource-conscious surgical planning.

Figure 1. Likelihood of Imaging Utilization by Case and Modality
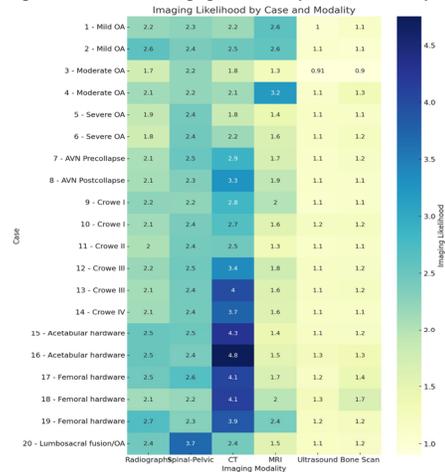
MRI, magnetic resonance imaging; CT, computed tomography; OA, osteoarthritis

Table 1. Average Likelihood of Advanced Imaging Utilization for All Cases

Advanced Imaging Modality	Ordering Likelihood (0-5)
CT	3.0
Spinal-Pelvic	2.4
Radiographs	2.2
MRI	1.8
Bone Scan	1.2
Ultrasound	1.1