

APPLICATION OF NOVEL X-RAY TECHNOLOGY

IN A DYSPLASTIC, COXA VALGA PRIMARY HIP ARTHROPLASTY

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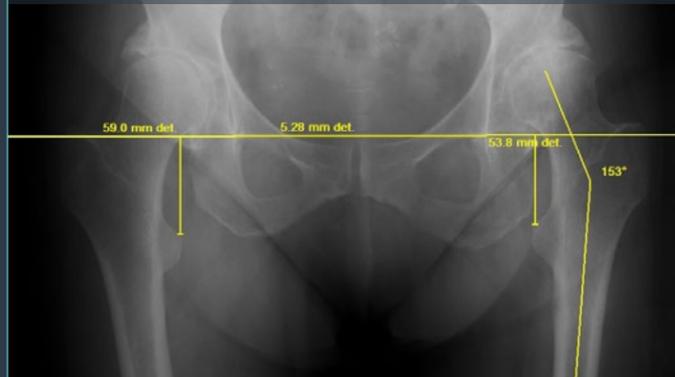


INTRODUCTION

A 72-year-old female presented with two years of progressively worsening groin pain. With no remarkable medical history and a moderate BMI of 27, the patient reported that previous interventions of NSAIDs, intra-articular injections, and modified physical activities did not result in lasting improvement to symptoms.

1 IMAGING STUDY

Preop standing OA left hip, leg shortening approximately 5mm due to superior acetabular and femoral head wear.



A standard imaging study was ordered, and x-rays revealed osteoarthritis of the left hip presumed to be secondary to subtle dysplasia. A coxa valga femoral neck shaft angle was apparent and measured to 153 degrees on the patient's left hip (operative side). Upon measurement of leg length, the left side was also found to be 5mm short compared to the contralateral side, factors which also were presumed to contribute to the patient's symptoms and impaired mobility.

2 PRE-OPERATIVE

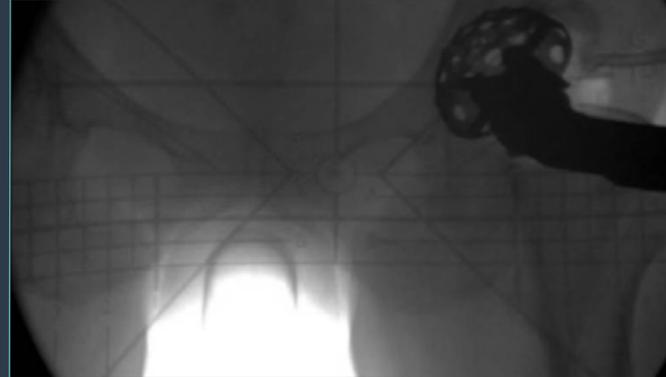
Preop templating establishing reaming depth and femoral neck cut.



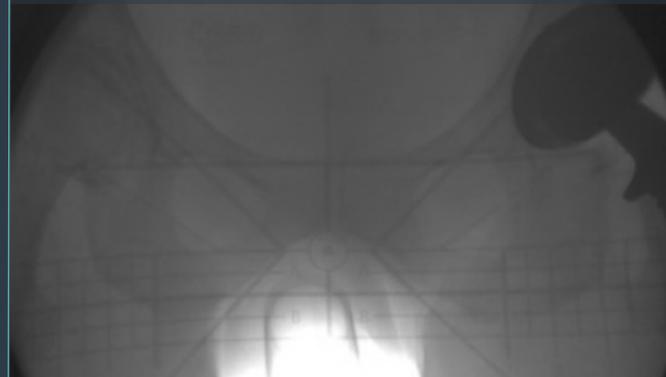
Patients presenting with a short lateral offset in conjunction with a long femoral neck length can be confounding to address due to the tendency to increase lateral offset to equalize leg length. Therefore, in preparation for this patient, it was important to plan to medialize the acetabular implant component to normalize the lateral offset and, importantly, to maximize the implant surface fixation potential in a dysplastic, shallow acetabulum. Because the patient perceived a leg length equality consistent with the imaging study of a 5mm discrepancy on the operative side, the surgical plan consisted of an atypically long neck cut to improve the likelihood of normalizing the leg lengths intra-operatively. This patient was an excellent candidate for a Direct Anterior Approach where intra-operative fluoroscopy would be utilized to confirm component placement and biomechanical restoration.

3 INTRA-OPERATIVE

Reaming under Fluoro to ensure adequate medialization for cup coverage.



Leg Length and Offset restoration confirmed with distortion considered.

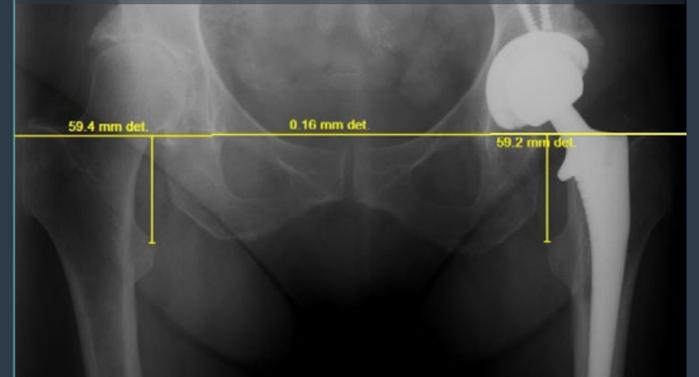


To achieve the best possible visualization in real-time, the acetabulum was reamed using fluoroscopy to ensure favorable cup position and to determine the proper amount of cup medialization in the shallow acetabulum. The targeted cup position was between 35-45 degrees of abduction to remain within the safe zone. Due to the confounding and challenging problems associated with x-ray distortion, particularly electromagnetic and pincushion distortion, the HipGrid® (OrthoGrid® Systems, Salt Lake City, UT) was utilized to reveal the distortion and mitigate the risk of error or reliance on incorrect information from fluoroscopy.

Using a c-arm with the HipGrid® product, the femoral stem implant was subsequently seated, and the benefit of the lengthy neck cut enabled a restoration of leg length in a manner that did not adversely affect lateral offset or have other unintended biomechanical consequences.

4 POST-OPERATIVE

Postop film confirming intraoperative results.



The outcome of this surgical procedure for this patient was a precise and effective joint restoration with demonstrably equal leg lengths and mechanically optimized lateral offset using the HipGrid® technology. Acetabular cup was confirmed at 40 degrees of abduction and within the safe zone. Discharged on post-operative Day 1, this patient experienced an uneventful recovery. At the two-week follow up interval, the patient reported mild surgical site pain that was controlled with Tylenol and Celebrex and was able to ambulate comfortably with a cane. At 90 days' intra-operative fluoroscopy would be utilized to confirm component placement and biomechanical restoration.



Advanced, real-time fluoroscopic grid technology designed to enhance intra-operative decision making in Total Hip Arthroplasty.