



# Survival of the native hip after spinopelvic fusion<sup>☆</sup>

Zachary C. Lum<sup>\*</sup>, Ahsan A. Khan, John P. Meehan

University of California: Davis Medical Center, Orthopaedic Surgery Department, 4860 Y Street, Suite 3800, Sacramento, CA, 95817, USA



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## ABSTRACT

Studies describe progression of adjacent joint arthritis after hip fusion but not vice versa. We investigated the relationship after spinopelvic fusion and total hip arthroplasty.

383 patients undergoing spinopelvic were investigated. Perioperative demographics were recorded. A matched 2:1 cohort was used to detect risk factors for THA progression. 10 patients (2.6%) underwent THA after spinopelvic fusion. Average time from surgery to THA was 24.4 months.

After spinopelvic fusion, patients progressed to THA 24.4 months on average. Due to small numbers, we couldn't find differences between the two groups regarding comorbidities nor risk factors for THA. Further studies are needed.

## 1. Introduction

Spinal decompression and fusion has been a successful surgery for the patient with debilitating pain and neurologic compromise. Many studies have suggested patients regain function and have adequate pain relief compared to nonoperative management.<sup>1</sup> After fusion of the vertebral segment, the adjacent joint experiences higher forces and may undergo faster arthritic degeneration, a process known as adjacent segment degeneration.<sup>2–4</sup> (see [Tables 1 and 2](#)).

While adjacent segment degeneration has been studied in the spine, it is unknown if spinopelvic fusion it affects the hip joint. Time between fusion, development of symptomatic arthritis and subsequent total hip arthroplasty (THA) has not been elucidated. The purpose of this study was to determine the temporal relationship after spinopelvic fusion and total hip arthroplasty and to investigate if there are any risk factors that may result in earlier THA surgery.

## 2. Methods

Retrospective chart review was performed between 2003 and 2016 of all patients at our tertiary center who underwent spinopelvic fixation via Current Procedural Terminology (CPT) code 22848. Patients were excluded if they were under the age of 40, a surrogate marker for procedures performed for scoliosis and neuromuscular scoliosis. Additional exclusion criteria were surgery for trauma, previous THA,

revision lumbar spine surgery and infection. Perioperative demographics such as age, sex, weight, height, BMI and comorbidities were recorded. Number of levels fused was confirmed by radiographic evidence and operative report. We then selected all patients who underwent subsequent total hip arthroplasty via CPT code 27130. Dates of spinopelvic fusion surgery and total hip arthroplasty were then recorded.

Patients were followed every 2 weeks, 6 weeks, 3 months and annually. Time from spinopelvic fixation and THA were calculated. A randomized age, sex, BMI matched 2:1 cohort was used to investigate comorbidity risk factors for arthritis hip progression. Statistical analysis was performed via student t-test for parametric data by Microsoft Excel (Redmond, WA, USA).<sup>5</sup>

## 3. Results

383 patients underwent spinopelvic fusion between 2003 and 2016. Many patients were excluded for age (35%), trauma (5%), infection (10%), and previous THA. 35% of patients had less than 1 year followup and were considered lost to followup. After exclusion criteria, 10 (2.6%) patients had subsequent THA after spinopelvic fusion.

Average time from surgery to THA was 24.4 months (range 3.5–91 months). Average number of levels fused was no different, 9.5 (range 3–20) in the THA group vs 9.5 in the control group (range 3–16,  $p = 0.96$ ). None of the 24 patients in the matched control group had

<sup>☆</sup> This work was performed at UC Davis Medical Center, Sacramento, CA.

<sup>\*</sup> Corresponding author. Orthopaedic Surgery Department, 4860 Y Street, Suite 3800, Sacramento, CA, 95817, USA.

E-mail address: [zacharylum@gmail.com](mailto:zacharylum@gmail.com) (Z.C. Lum).

**Table 1**  
Preoperative data.

	Spinopelvic n = 12	Matched n = 24	p
Age	70.42	70.9	0.88
Sex	75% female	62% female	0.38
BMI	27.56	27.39	0.93
Fusion levels	9.5	9.5	0.96
Follow up	44.8 mo	69.8 mo	0.03

**Table 2**  
Preoperative comorbidities.

	THA n = 12		NON THA n = 24	
HTN	9	75%	15	62.5%
HLD	1	8.3%	5	20.8%
CAD	1	8.3%	5	20.8%
Cancer HX	2	16.7%	3	12.5%
DM	1	8.3%	5	20.8%
Hypothyroidism	3	25%	5	20.8%
Cirrhosis	0	0	2	8.3%
none	2	16.7%	1	4.1%

any differences with regard to comorbidities. Follow up for both groups was greater than 36 months (48.5 in spinopelvic group, 69.8 in control group) with difference between followup was greater in the control group (p = 0.03).

**4. Discussion**

Spinopelvic fusion may be necessary in certain spinal conditions and pathology. However, it is not without potential risk and

complications.<sup>6,7</sup> Besides the risks of a larger surgery, risk of nonunion, wound complications and other morbidity and mortality, long term development of hip arthritis and subsequent total hip arthroplasty may be a possibility.

Our data reported that the average patient with spinopelvic fusion received THA from progressive symptomatic hip arthritis at an average time of 2 years (range 3–91 months) (Figs. 1–3). Lee et al. reported that 32% of patients with operative spinal disease had hip pathology including arthritis, avascular necrosis and other abnormalities. They suggested a link between the two pathologies. Our results may also suggest a possible temporal relationship.

With small numbers, we were unable to draw many conclusions besides a temporal relationship between patients who underwent THA and those who did not. Comorbidities such as hypertension, coronary artery disease, hyperlipidemia, hypothyroidism, cancer history or diabetes did not differ in percentages between the two groups, although our study is not sufficiently powered to detect such differences. Another limitation of the study is the large lost to followup and large exclusion criteria. Many surgeries were performed in the setting of scoliosis and neuromuscular scoliosis, and a large percentage of patients were lost to followup. Although our numbers may be small, the overall percentage of patients with spinal surgery who subsequently underwent THA is consistent with the overall numbers in previous studies.<sup>8</sup> Lastly, due to small numbers, we were unable to report any difference between those patients who progressed to arthritis, and those who did not. More research on this topic may be helpful.

**5. Conclusion**

Patients with spinopelvic fusion went on to progressive hip arthritis and subsequent total hip arthroplasty at an average of 2 years. More studies are necessary to elucidate a clear relationship between patients who underwent arthroplasty and those who did not.



**Fig. 1.** Postoperative spinopelvic fusion.

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