ORIGINAL ARTICLE

# The effect of degenerative scoliosis and spinopelvic parameters on dislocation of hip hemiarthroplasty


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## ABSTRACT

**BACKGROUND:** Degeneration of the spine may affect pelvic parameters and hip mobility. This study aimed to evaluate the effects of degenerative scoliosis and spinopelvic parameters on hip hemiarthroplasty dislocations.

**METHODS:** A retrospective analysis was conducted on patients who underwent hemiarthroplasty for intracapsular hip fracture over a twenty-year period. Demographic data, dislocation incidence, degenerative scoliosis (DS) status, type of hemiarthroplasty, surgical intervention to the hip, femoral head size, cement use, American Society of Anesthesiologists (ASA) score, body mass index (BMI), and in-hospital mortality were evaluated. The Cobb angle (CA), pelvic incidence (PI), sacral slope (SS), pelvic tilt (PT), lumbar lordosis (LL), and thoracic kyphosis (TK) angles were measured and analyzed.

**RESULTS:** A total of 284 patients were evaluated, with a mean age of 79.07 (±8.21) years. The frequency of hemiarthroplasty dislocation was 13% (n=37). Degenerative scoliosis was detected in 25.4% of the cases and was significantly more common in patients with degenerative scoliosis (p=0.001). Advanced age, higher BMI, higher ASA score, unipolar and cementless hemiarthroplasty, smaller femoral head size, and the posterior approach significantly increased dislocation frequency (p=0.004, p=0.001, p=0.03, p=0.001, p=0.001, and p=0.026, respectively). The mean PI, SS, PT, LL, and TK angles were significantly reduced in patients with dislocation and degenerative scoliosis (dislocation: p=0.001, p=0.001, p=0.001, p=0.003, p=0.048; degenerative scoliosis: p=0.001, p=0.001, p=0.001, p=0.001, p=0.001; respectively).

**CONCLUSION:** The presence of degenerative scoliosis and low pelvic incidence, sacral slope, pelvic tilt, thoracic kyphosis, and lumbar lordosis angles may increase the frequency of hemiarthroplasty dislocations. The posterior approach and small femoral head size may also elevate the risk of posterior dislocation.



**Keywords:** Degenerative scoliosis; hemiarthroplasty dislocation; spinopelvic parameters.


## INTRODUCTION

Hip fracture is a serious health problem expected to affect 18% of females and 6% of males as the elderly population increases.[1] Displaced intra-articular hip fractures are usually treated with hemiarthroplasty or total hip arthroplasty.[2] The frequency of hemiarthroplasty dislocation has been reported to vary between 1.5% and 15%.[3] Hemiarthroplasty


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dislocation and instability are associated with repeated hospitalizations, arthroplasty revision, and early mortality.[4] Factors such as a posterior approach, offset incongruity, the use of unipolar or bipolar implants, and advanced age have been reported to affect instability.[5]

Degenerative scoliosis (DS) is differentiated from adult scoliosis as a progressive deterioration of structural spinal elements, leading to malalignment of the spinal column.[6] The most frequent locations of degenerative scoliosis are the thoracolumbar, lumbar, and lumbosacral regions, with an occurrence rate of 30-70% in elderly cases.[6,7] The frequency of DS is expected to increase with rising average age. It is generally seen in the seventh decade of life and affects the lumbar spine with angulation of >10° in the coronal plane. Lumbar lordosis, with simultaneous pelvic incidence, may increase problems related to the hip joint by enhancing pelvic retroversion.[8]

Biomechanically, the hips and spine work together in coordination. A decrease in lumbar lordosis and posterior tilt of the sacrum when moving from a standing to a sitting position leads to an increase in acetabular anteversion, and the congruity of the femoral head with the acetabulum in flexion enhances joint stability.[9,10] In conditions where sufficient acetabular anteversion cannot be achieved-such as degenerative spine or lumbosacral fusion, where spinopelvic weight transfer is impaired-instability may develop in the hip prosthesis due to increased acetabular retroversion.[11] Although there are studies in the literature that have examined the effects of spinopelvic parameters on hip prosthesis instability, no study has evaluated whether these parameters affect hemiarthroplasty dislocations following fractures.[10,12-14]

The aim of this retrospective study was to evaluate the effects of degenerative scoliosis and spinopelvic parameters on hemiarthroplasty dislocations. The primary dependent variable was defined as dislocation frequency, with secondary variables including in-hospital mortality and length of hospital stay.

## MATERIALS AND METHODS

Approval for this study was granted by the Institutional Review Board (Approval Number: 2020-370), and all procedures were conducted in compliance with the 1964 Helsinki Declaration and later amendments or comparable ethical standards.

Patient and surgical records were analyzed and grouped by three orthopedic surgeons at a single center. A retrospective examination was conducted of 8,123 cases in which patients underwent hemiarthroplasty surgery for intracapsular hip fractures between January 1999 and January 2018. The study included 284 (3.5%) patients aged over 65 years, with no pre-fracture history of spine or hip surgery, no neurological, oncological, or rheumatological involvement of the hip or spine, and who with complete standing posteroanterior and lateral hip and spine radiographs in the imaging system taken prior to the fracture due to back, lower back, or neck complaints, or the presence of DS. In addition to demographic data (age, gender, side), cases were evaluated regarding dislocation incidence, mean number of dislocations, time to first dislocation, surgical approach (posterior or direct lateral), in-hospital mortality, length of hospital stay, American Society of Anesthesiologists (ASA) score, body mass index (BMI), mean follow-up period, use of cement, type of hemiarthroplasty (bipolar or unipolar), and femoral head and stem diameters.

### Radiological Evaluation

All radiological measurements and evaluations were performed by a radiology specialist with 25 years of experience in the musculoskeletal system. All angles were measured using the public, open-access OsiriX Lite DICOM viewer program (Pixmeo, Switzerland). The Cobb angle (CA) was measured between the upper and lower vertebrae of the curve with the greatest tilt (Fig. 1). The pelvic incidence (PI) angle was defined as the angle between the line drawn perpendicular to the midpoint of the first sacral upper endplate and the line touching the center of the femoral heads (Fig. 2).[15] This angle is considered the most reliable of the spinopelvic parameters as it does not change after adolescence.[16] The sacral slope (SS) angle is the angle between the line drawn from the upper sacral endplate and the horizontal line drawn from the midpoint of the upper sacral endplate.

The pelvic tilt (PT) angle is the angle between the vertical line crossing the femoral head axis and the line joining the sacral endplate midpoint with the femoral head axis.[12] The lumbar lordosis (LL) angle is the angle between the line drawn perpendicular to the line crossing the first lumbar vertebra's upper endplate and the line drawn perpendicular to the line crossing the sacral endplate.

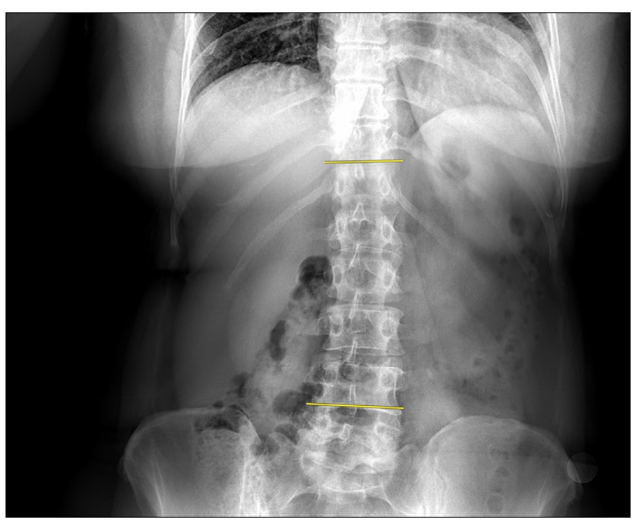

**Figure 1.** Frontal whole spine radiograph. The Cobb angle (yellow lines) was measured at 4°.

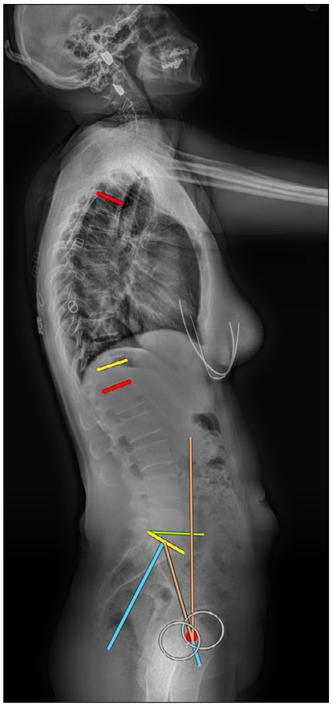

**Figure 2.** Standing lateral whole spine radiograph. The pelvic incidence is formed by a line drawn from the midpoint of the femoral heads (red dot) to the midpoint of the superior endplate of S1 and a line drawn perpendicular to a line parallel to the superior endplate of S1 (blue line).

*The sacral slope is the angle created by a line drawn along the superior endplate of S1 (yellow line) and a line parallel to the floor (green line). Sacral slope plus pelvic tilt equals pelvic incidence. (In this patient: sacral slope 28°, pelvic tilt 15°, pelvic incidence 43°).*
*The pelvic tilt is the angle formed between a line drawn from the midpoint of the femoral heads to the center of the superior endplate of the sacrum and a vertical line through the midpoint of the femoral heads (orange lines). (In this patient: pelvic incidence 43°, pelvic tilt 15°, sacral slope 28°).*
*The lumbar lordosis is defined as the Cobb angle created by the intersection of lines drawn across the superior endplate of T12 and S1 (yellow lines). In this patient, lumbar lordosis is 48°.*
*The thoracic kyphosis angle is created by drawing a line across the superior endplate of T4 and the inferior endplate of T12 (red lines). In this patient, thoracic kyphosis is 44°.*

The thoracic kyphosis (TK) angle is the angle between the line drawn perpendicular to the line crossing the T4 upper endplate and the line drawn perpendicular to the line crossing the T12 lower endplate (Fig. 2).

### Statistical Analysis

Data obtained in the study were analyzed statistically using IBM SPSS version 28 software (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to analyze the data (mean ± standard deviation, median, minimum, and maximum values). Conformity of the data to normal distribution was assessed with the Kolmogorov-Smirnov test. Parametric and non-parametric variables were evaluated using the Independent Samples t-test, the Mann-Whitney U test, and the Chi-square test, respectively. To determine cutoff values and differentiate the Cobb angle and spinopelvic parameters, receiver operating characteristics (ROC) analysis was applied. The level of statistical significance was set at an overall 5% Type I error level.

**Table 1.** Mean, standard deviation, and frequency values of independent variables affecting hemiarthroplasty dislocation

| | Dislocated | | Normal | | |
|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **p-value** |
| Age | 82.78 | 7.98 | 78.53 | 8.12 | 0.004 |
| ASA Score | 3.22 | 0.59 | 2.55 | 0.84 | 0.001 |
| BMI | 29.10 | 4.86 | 25.87 | 3.64 | 0.001 |
| FHS (mm) | 45.28 | 4.85 | 48.65 | 4.59 | 0.001 |
| FSS (mm) | 11.31 | 1.37 | 11.64 | 1.47 | 0.198 |
| | **%** | **n** | **%** | **n** | **p-value** |
| Scoliosis | 29.2 | 21 | 7.5 | 16 | 0.001 |
| Gender (Male/Female) | 9.6/16.7 | 14/23 | 90.4/83.7 | 132/115 | 0.077 |
| Bipolar/Unipolar | 9.9 | 9 | 16.4 | 28 | 0.039 |
| Cemented/Uncemented | 8.3/18 | 12/25 | 91.7/82 | 133/114 | 0.015 |
| Scoliosis/Normal | 29.2/7.5 | 21/16 | 70.8/92.5 | 51/196 | 0.001 |

ASA: American Society of Anesthesiologists; BMI: Body Mass Index; FHS: Femoral Head Size; FSS: Femoral Stem Size; SD: Standard Deviation.

## RESULTS

A total of 284 patients were evaluated, comprising 137 (48.2%) females and 147 (51.8%) males with a mean age of 79.07±8.21 years. The left side was affected in 148 (51.4%) cases and the right side in 138 (48.6%) cases. The frequency of hemiarthroplasty dislocation was 13% (n=37), and the age of patients with dislocation was found to be significantly higher (p=0.004) (Table 1). No significant difference was found between genders regarding dislocation frequency (p=0.077). The mean rate of in-hospital mortality was 10.6% (n=30), and the mean age of deceased patients was significantly higher (p=0.046) (Table 2). The mean follow-up period for patients was 115±53.88 weeks.

The mean ASA score was 2.63±0.84, which was higher in deceased patients (p=0.004) and significantly elevated in patients with dislocations (p=0.001). The ASA score was also significantly higher in patients with DS compared than in those without (ASADegenerative Scoliosis: 2.81±0.73, ASANormal: 2.58±0.87; p=0.029). The mean BMI was 26.28±3.96 and was significantly higher in deceased patients (p=0.045) and in cases with hemiarthroplasty dislocation (p=0.001). The ASA score was elevated in cases with hemiarthroplasty dislocation (p=0.001).

A posterior approach was used in 81.3% of cases (n=231), and a direct lateral approach was used in 18.7% of cases (n=53). In patients operated on using the posterior approach, the risk of dislocation was found to be 4.015 times higher than in those where the lateral approach was used (95% confidence interval (CI), odds ratio (OR): 4.015 [1.003-16.174], p=0.026).

Bipolar hemiarthroplasty was applied to 113 (39.8%) fractures and unipolar hemiarthroplasty to 171 (60.2%) fractures. The frequency of hemiarthroplasty dislocation was determined to be twice as high in cases with unipolar hemiarthroplasty compared to those with bipolar hemiarthroplasty (95% CI, OR: 2.056 [1.008-4.192], p=0.039). No statistically significant difference was found concerning in-hospital mortality rates (p=0.227).

No statistically significant difference was observed between the bipolar and unipolar hemiarthroplasty groups regarding the mean number of dislocations (DislocationBipolar: 1.78±0.67, DislocationUnipolar: 1.87±1.09; p= 0.0809). The

**Table 2.** Evaluation of in-hospital mortality according to age, body mass index, American Society of Anesthesiologists score, type of hemiarthroplasty, and cement use

| Variables | Average | | Exitus | | Survivors | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | p-value |
| Age | 79.07 | 8.21 | 81.45 | 9.52 | 78.55 | 7.82 | 0.046 |
| BMI | 26.28 | 3.96 | 27.65 | 5.62 | 25.87 | 3.43 | 0.045 |
| ASA | 2.63 | 0.84 | 2.94 | 0.88 | 2.57 | 0.82 | 0.004 |
| | % | n | % | n | % | n | p-value |
| Bipolar/Unipolar | 10.6 | 30 | 13.3/8.8 | 15/15 | 86.7/91 | 98/156 | 0.227 |
| Cemented/Uncemented | 10.6 | 30 | 4.8/16.5 | 7/23 | 95.2/83.5 | 138/116 | 0.001 |

ASA: American Society of Anesthesiologists; BMI: Body Mass Index; SD: Standard Deviation.

**Table 3.** Comparisons of the mean ± standard deviation values of Cobb, pelvic incidence, sacral slope, lumbar lordosis, and thoracic kyphosis angles between dislocated and non-dislocated hemiarthroplasties

| Variables | Average | | Dislocated | | Not Dislocated | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | p-value |
| Cobb Angle | 8.43 | 11.31 | 29.54 | 20.80 | 5.26 | 5.82 | 0.001 |
| Pelvic Incidence | 53.48 | 8.63 | 43.00 | 9.18 | 55.00 | 7.43 | 0.001 |
| Pelvic Tilt | 9.20 | 2.86 | 6.50 | 2.59 | 9.60 | 2.68 | 0.001 |
| Sacral Slope | 44.27 | 6.38 | 36.72 | 6.91 | 45.57 | 5.51 | 0.001 |
| Lumbar Lordosis | 44.29 | 10.36 | 39.43 | 11.39 | 44.98 | 10.04 | 0.003 |
| Thoracic Kyphosis | 34.82 | 10.11 | 31.76 | 10.23 | 35.28 | 10.03 | 0.048 |

SD: Standard Deviation.

**Table 4.** Receiver operating characteristics (ROC) analysis of the Cobb angle and other spinopelvic parameters in patients with dislocation

| Variables (Asymptomatic 95% CI) | Sensitivity % | Specificity % | AUC % | p-value |
|---|---|---|---|---|
| Cobb Angle | 97 | 79 | 91 (87-95) | 0.001 |
| Pelvic Incidence | 72.2 | 77 | 82.7 (74.7-90.7) | 0.001 |
| Sacral Slope | 75 | 73.6 | 82 (74-90) | 0.001 |
| Pelvic Tilt | 69.4 | 75.4 | 79.6 (71.2-87.9) | 0.001 |

AOC: Area Under the Curve.

**Table 5.** Comparison of pelvic incidence, sacral slope, pelvic tilt, lumbar lordosis, and thoracic kyphosis angles between groups with and without scoliosis

| Variables | Scoliosis | | No Scoliosis | | |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | p-value |
| Pelvic Incidence | 45.97 | 8.96 | 56.02 | 7.87 | 0.001 |
| Sacral Slope | 38.75 | 6.61 | 46.15 | 5.01 | 0.001 |
| Pelvic Tilt | 7.24 | 2.61 | 9.87 | 2.63 | 0.001 |
| Lumbar Lordosis | 32.11 | 6.46 | 48.31 | 7.99 | 0.001 |
| Thoracic Kyphosis | 24.92 | 5.57 | 28.19 | 9.04 | 0.001 |

SD: Standard Deviation.

time to first dislocation postoperatively was statistically significantly longer in the bipolar group than in the unipolar group (MedianBipolar: 30.89, MedianUnipolar: 17.48; p=0.002). The mortality rate in cases with cement usage was determined to be 3.428 times higher than in non-cemented cases (95% CI, OR: 3.428 [1.520-7.731], p=0.001).

The mean femoral head diameter was found to be 48.22±4.75 mm, and the femoral stem diameter was 11.60±1.46 mm. In cases with dislocation, the femoral head size was significantly smaller (p=0.001), while no significant difference was found concerning femoral stem diameter (p=0.198).

The median time between spine radiograph and hip fracture occurrence was 36 weeks (minimum: 1, maximum: 221, variance: 829.33). A shorter interval between regular radiographs and hip fracture appeared relevant to accurately representing spine posture during surgery. The mean CA was 8.43±11.31° and was significantly higher in cases with dislocation (p=0.001) (Table 3). DS was identified in 72 (25.4%) cases and absent in 212 (74.6%) cases. The frequency of hemiarthroplasty dislocation in cases with DS was increased 5.044-fold (95% CI, OR: 5.044 [2.456-10.359], p=0.001). ROC analysis showed that a CA of ≥8.5° was statistically significant in predicting dislocation risk (p=0.001) (Table 4).

The mean PI angle was 53.48±8.63° and was significantly lower in the dislocation group (p=0.001). Additionally, the mean PI angle was statistically significantly lower in cases with DS compared to those without (p=0.001) (Table 5). In ROC analysis, a PI angle of <50.50° was found to be statistically significant regarding the risk of dislocation (p=0.001). The mean SS angle was 44.27±6.38° and was significantly lower in cases with dislocation (p=0.001). The mean SS angle was also significantly lower in cases with DS compared to those without (p=0.001) (Table 5). In the ROC analyses, an SS angle of <41.5° was statistically significant for dislocation risk (p=0.001).

The mean PT angle was 9.20±2.86° and was significantly lower in cases with dislocation (p=0.001). The mean PT angle was also statistically significantly lower in cases with DS compared to those without (p=0.001). In the ROC analysis, a PT angle of <7.5° was statistically significant regarding dislocation risk (p=0.001).

The mean LL and TK angles were 44.29±10.36° and 34.82±10.11°, respectively, and were significantly lower in cases with dislocation (PLL=0.003, PTK=0.048). The mean LL and TK angles were also significantly lower in cases with DS (PLL=0.001, PTK=0.001).

The mean length of hospital stay (LOS) was calculated as 11.83±7.74 days (range, 2-45 days) with no significant difference observed according to gender (LOSFemale: 12.12±7.70, LOSMale: 11.56±7.80; p=0.547). No significant difference was found between cases with and without dislocation concerning LOS (LOSDislocated: 12.25±8.74, LOSNormal: 11.77±7.61; p=0.729). Additionally, no significant difference was determined between cases where cement was used or not regarding LOS (LOSCemented: 12.01±7.47, LOSUncemented: 11.61±8.10; p=0.668).

## DISCUSSION

The most significant findings of this study were that DS was present in approximately one-quarter of cases with hip fractures and that DS significantly increased the risk of hemiarthroplasty dislocation. Although no studies were identified in the literature on this specific subject, it is known that spinal problems can impact hip arthroplasty. In a recent study by Yang D.S. et al.,[17] which screened a large number of cases, a 3.5-fold higher risk of dislocation was reported in cases with spinopelvic fusion. Grammatopoulos et al.[18] compared total hip arthroplasty cases with and without spinal fusion and reported lower dislocation and revision rates, along with better clinical outcomes, in the group without spinal fusion. In a cohort study by Blizzard D.J. et al.[19] that included total hip arthroplasty (THA) cases with lumbar scoliosis and kyphosis, higher rates of prosthetic hip dislocation and component revision were reported in cases with spinal deformity.[19]

Variations in pelvic morphology affect the hip range of motion. Low PI and SS can decrease retroversion in narrow and vertical pelvises, leading to a stiffer lumbosacral junction.[20] With a stiffened lumbosacral junction, pelvic motion is more likely to be transferred to the hip joint. These cases are known as "hip users."[20] In such cases, acetabular inclination and anteversion angles may increase to align with femoral head movement.[20] In hypermobile hips with low PI and limited rotation capacity (due to stiff lumbosacral movement), excessive flexion while sitting can increase the risk of posterior dislocation due to anterior prosthetic impingement.[21] When cases with hip hemiarthroplasty dislocation in the present study were compared to those without dislocation, PI, SS, and PT angles were found to be lower, as were LL and TK angles. A PI angle <50.50°, SS of <41.5°, and PT of <7.5° were significantly associated with an increased risk of hemiarthroplasty dislocation. Similarly, all three spinopelvic parameters were low in cases with DS. Although not definitively proven, hemiarthroplasty dislocations in cases with low PI and DS may result from lumbosacral joint stiffness, insufficient pelvic retroversion, and a hypermobile hip joint. Therefore, in addition to multicenter, standardized studies with larger case numbers, biomechanical studies may also be beneficial in this area.

In the present study, hemiarthroplasty dislocation was observed more frequently in cases with older age, higher BMI, and higher ASA scores. Dislocation was observed twice as frequently in unipolar hemiarthroplasty compared to bipolar hemiarthroplasty and tended to occur in the early postoperative period. While the dislocation risk was higher in cases with a smaller femoral head size, femoral stem size did not appear to increase the risk. The rate of dislocation was also found to decrease by half in cases where cement was used. Consistent with these findings, Salem KMI et al.[22] examined 3,525 cases of femoral neck fracture and similarly reported that bipolar hemiarthroplasty and the use of cement reduced dislocation risk. In a 2015 meta-analysis by Zou Z. et al.,[23] unipolar and bipolar prostheses were compared, and no differences were reported in dislocation rates, functional scores, complications, or mortality rates. Yerli et al.[24] reported no significant difference in complications between monopolar and bipolar groups. Leonard O. et al.[25] analyzed 23,509 cases and found that bipolar hemiarthroplasty and the lack of cement use increased the risk of dislocation and reoperation; therefore, cemented unipolar hemiarthroplasty was recommended. These contrasting findings may be due to differences in sample sizes, hemiarthroplasty types, surgical techniques, timing, and study design.

The results of this study indicated that the risk of hemiarthroplasty dislocation could be increased approximately fourfold with the use of the posterior approach, consistent with general evidence in the literature that the posterior approach heightens dislocation risk.[3,25]

In a 2021 study by Jobory A. et al.,3 which screened 25,678 cases, the posterior approach was reported to increase dislocation risk by 2.7-fold. This may be due to posterior failure associated with insufficient posterior capsule and soft tissue reconstruction. Although not definitive, a combination of posterior approach, small femoral head size, a stiff spine, and a hypermobile hip joint in the seated position could contribute to anterior impingement and posterior hemiarthroplasty dislocation.

While there is extensive research in the literature on factors affecting mortality in hip fracture cases, debate on this topic is still ongoing. In a study by Groff et al.[26] on hip fractures in patients over 65 years, advanced age and the level of comorbidities were found to affect in-hospital mortality, while gender, BMI, fracture type (intracapsular or extracapsular), and whether the fracture was pathological had no impact on mortality rates. In another meta-analysis conducted in 2014, male gender, intracapsular fracture, high ASA score, age over 85 years, and cognitive dysfunction were associated with higher mortality rates.[27] In the current study, in-hospital mortality was higher in cases of advanced age, high ASA score, high BMI, and in cases without cement use; however, gender and the selection of unipolar or bipolar hemiarthroplasty did not affect mortality rates. Differences in the results of these studies may be due to variations in sample groups and sizes, inclusion of different fracture types, differing pre- and postoperative treatment protocols, and different follow-up periods.

The limitations of this study include its retrospective, single-center design, a relatively low sample size, and the exclusion of some radiological and morphological factors that may influence hip fractures due to non-standardized hip radiographs.

## CONCLUSION

In conclusion, this study demonstrated that DS, along with low pelvic incidence, pelvic tilt, sacral slope, thoracic kyphosis, and lumbar lordosis angles, may increase the risk of hemiarthroplasty dislocation in patients with hip fractures. Additionally, advanced age, elevated BMI, high ASA score, posterior surgical approach, small femoral head size, and cementless hemiarthroplasty may contribute to increased hospital mortality.

**Ethics Committee Approval:** This study was approved by the Prof. Dr. Cemil Tascioglu City Hospital Ethics Committee (Date: 28.09.2020, Decision No: 48670771-514.10).

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ORİJİNAL ÇALIŞMA - *ÖZ*

# Degeneratif skolyoz ve spinopelvik parametrelerin kalça hemiartroplastisi dislokasyonu üzerindeki etkisi

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AMAÇ: Dejeneratif omurga pelvik parametreleri ve kalça hareketliliğini etkileyebilir. Bu çalışmanın amacı, dejeneratif skolyoz ve spinopelvik parametrelerin kalça hemiartroplasti çıkığı üzerindeki etkilerini değerlendirmektir.

GEREÇ VE YÖNTEM: Yirmi yıllık dönemde intrakapsüler kalça kırığı nedeniyle hemiartroplasti geçiren hastalar retrospektif olarak tarandı. Demografik veriler, çıkık ve dejeneratif skolyoz (DS) durumu, hemiartroplasti tipi, kalça eklemine cerrahi yaklaşım tipi, femoral baş boyutu, çimento kullanımı, Amerikan Anestezi Cemiyeti (ASA) skoru, vücut kitle indeksi (VKİ) ve hastane mortalitesi değerlendirildi. Cobb açısı (CA), pelvik insidans (PI), sakral eğim (SS), pelvik eğim (PT), lomber lordoz (LL) ve torasik kifoz (TK) açıları da radyolojik olarak değerlendirildi.

BULGULAR: Ortalama yaşı 79.07 (±8.21) olan 284 hasta değerlendirildi. Hemiartroplasti çıkık sıklığı %13 idi (n=37). Dejeneratif skolyoz vakaların %25.4'ünde tespit edildi. Çıkık oranı dejeneratif skolyozlu hastalarda anlamlı olarak daha yüksekti (p=0.001). İleri yaş, yüksek vücut kitle indeksi ve ASA skoru, unipolar ve çimentosuz hemiartriplasti, düşük femoral baş boyutu ve kalçaya posterior yaklaşımın çıkık sıklığını arttırdığı görüldü (sırasıyla, p=0.004, p=0.001, p=0.03, p=0.001, p=0.001, p=0.026). Ortalama pelvik insidans, sakral eğim, pelvik eğim, lomber lordoz ve torasik kifoz açıları çıkık ve dejeneratif skolyozu olan hastalarda anlamlı olarak düşüktü (çıkık: sırasıyla, p=0.001, p=0.001, p=0.001, p=0.003, p=0.048; dejeneratif skolyoz: sırasıyla, p=0.001, p=0.001, p=0.001, p=0.001, p=0.001).

SONUÇ: Dejeneratif skolyoz varlığı ve düşük pelvik insidans, sakral eğim, pelvik tilt, torasik kifoz ve lomber lordoz açıları hemiartroplasti çıkık sıklığını artırmaktadır. Yine, kalçaya posterior yaklaşım ve düşük femoral baş boyutu çıkık riskini artırabilir.

Anahtar sözcükler: Dejeneratif skolyoz; hemiartroplasti çıkığı; spinopelvik parametreler.

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