Risk of Iatrogenic Sciatic Nerve Injury During Posterior Acetabular Fracture Fixation: Does Patient Position Matter?

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Purpose: Iatrogenic sciatic nerve injury occurs in 2% to 16% of acetabular fracture fixations. Up to 55% of these patients have persistent motor deficits. This study is the first to our knowledge to assess the influence of patient positioning with iatrogenic sciatic nerve palsy as the primary outcome. We hypothesize there is no difference in iatrogenic sciatic nerve palsy with respect to patient position when controlling for other risk factors.

Methods: Electronic medical records from 2 Level I academic trauma centers were searched to identify patients with a posterior approach for acetabular fixation from 2010-2020. The prevalence of iatrogenic sciatic nerve palsy was found using pre- and postoperative documentation of motor and sensory deficits. Patients with inadequate documentation were excluded. The palsy group was compared to a random sample of non-palsy patients at a 1:4 ratio. The association between iatrogenic sciatic nerve palsy and patient positioning (prone vs lateral) was determined with adjustment for patient demographics and comorbidities (age, sex, body mass index, tobacco use, diabetes, neuropathy), injury characteristics (fracture pattern, associated hip dislocation), and surgical factors (time to surgery, intraoperative blood loss and transfusions, duration of surgery, staged approach, surgeon experience) by multivariate logistic regression analysis.

Results: 16 surgeons performed 922 posterior approaches for acetabular fixation. The rate of iatrogenic sciatic nerve palsy was 8.4% (36 of 428) in the prone position and 0.8% (4 of 494) in the lateral position ($P<0.001$). Comparison of palsies (n = 40) to the non-palsy subset (n = 171) showed that prone positioning (vs lateral) (adjusted odds ratio [aOR] 4.81, 95% confidence interval [CI] 1.60, 14.4; $P = 0.001$) was the most important independent predictor of postoperative sciatic nerve palsy, followed by intraoperative blood loss (per 100 mL increase, aOR 1.09, 95% CI 1.02, 1.17; $P = 0.008$), and a fracture pattern involving both the posterior wall and posterior column (aOR 2.56, 95% CI 1.16, 5.66; $P = 0.02$). These three risk factors in combination had good ability to predict likelihood of sciatic nerve palsy (C-statistic = 0.754, $P<0.0001$). Of the patients with an iatrogenic motor palsy and minimum of 6-month follow-up or earlier resolution, 68% (21/31) had transient palsy that resolved at a median of 70 days, while 32% had persistent foot drop.

Conclusion: Associations with nerve palsy included patient position, intraoperative blood loss, and fracture patterns that involve both the posterior column and posterior wall. Contrary to previously published data, the prone position had a higher prevalence of iatrogenic sciatic nerve palsy compared to lateral positioning when adjusting for other risk factors.