1-Year Periprosthetic Fracture Incidence Following Total Hip Arthroplasty: Moving in the Wrong Direction

Introduction: Periprosthetic fracture (PPFx) is a serious complication following total hip arthroplasty (THA), often resulting in revision surgery, prolonged morbidity, and increased healthcare costs. Implant design has been implicated in fracture risk, with triple taper wedge stems suggested to reduce the incidence of PPFx. However, national data evaluating longitudinal trends in PPFx rates and the influence of patient age and sex remain limited. This study aimed to assess temporal changes in 1-year PPFx incidence after THA over a 12-year period and a shift towards contemporary femoral stem designs and techniques.

Methods: Patients undergoing primary THA between 2010–2022 were identified using a large, national database. PPFx within 1 year was captured using ICD codes. Annual incidence was calculated, and linear regression assessed temporal trends. Fracture incidences were compared before and after 2015, with subgroup analyses by age (<70 vs ≥70 years) and sex.

Results: A total of 797,551 primary THAs were analyzed. One-year PPFx incidence increased from 0.67% to 1.30%, with a significant yearly rise (slope 0.00057; 95% CI 0.00049–0.00066). Incidence was higher post-2015 compared with pre-2015 (1.21% vs 0.79%; OR 1.54, 95% CI 1.46–1.61). Patients ≥70 years had slightly higher PPFx rates than those <70 years (0.99% vs 0.88%), though this did not reach statistical significance (OR 1.12; 95% CI 1.00–1.26). Females demonstrated higher overall PPFx incidence than males, with earlier age-related increases.

Conclusion: One-year PPFx incidence after THA increased between 2010–2022, with higher rates in the post-2015 era. Females and older patients demonstrated greater risk, with distinct age-related patterns by sex. These findings suggest that PPFx incidence is rising despite advances in femoral stem design. Further work is needed to clarify the relative contributions of patient factors, implant selection, and surgical technique.

Figure 1: Annual Trends of 1-Year Periprosthetic Fracture After THA

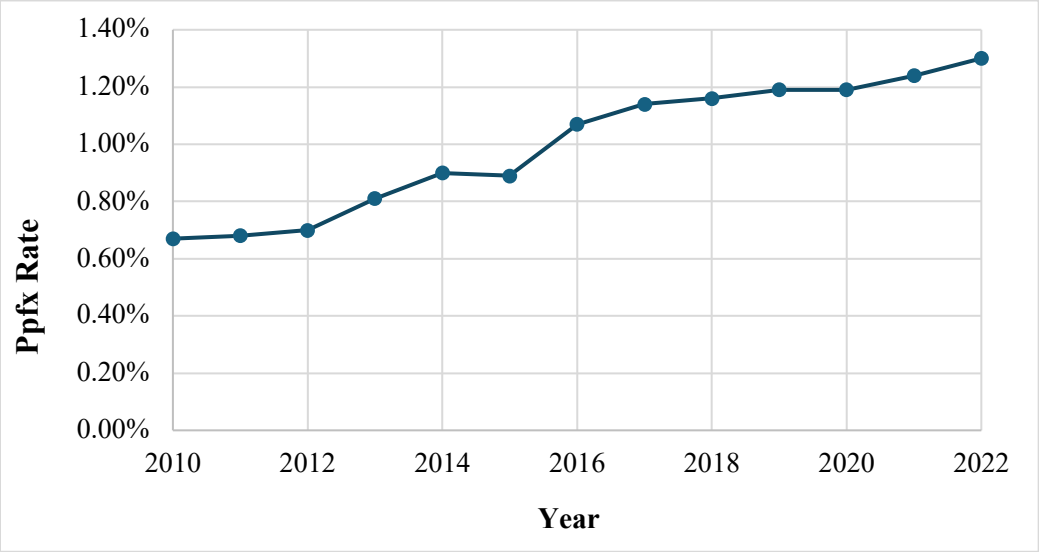

Table 8. One-year PPFX after THA by Age and Sex

Cutoff	Male THA (n)	Male PPFX (%)	Female THA (n)	Female PPFX (%)
≥65	165,310	0.79	254,991	1.40
≥70	107,612	0.88	175,654	1.51
≥75	45,001	1.06	77,194	1.78
≥80	4,367	1.60	7,714	2.15