Spontaneous Osteonecrosis of the Knee (SPONK) is Associated With Increased Five-Year Implant Complications Compared to Osteoarthritis Patients Undergoing Primary Total Knee Arthroplasty

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INTRODUCTION:

Spontaneous osteonecrosis of the knee (SPONK) is a non-traumatic disorder that primarily affects the medial femoral condyle in patients over 50 years of age and typically occurs without systemic risk factors such as corticosteroid or alcohol use. Total knee arthroplasty (TKA) implant survivorship in patients with SPONK versus primary osteoarthritis (OA) remains under-characterized. This study aimed to compare two- and five-year implant complications, including aseptic loosenings, periprosthetic joint infections (PJIs), periprosthetic fractures, and all-cause revisions in patients undergoing TKA for SPONK versus OA.

METHODS:

A nationwide database was retrospectively queried from 2010 to 2021 for patients ≥ 50 years old undergoing primary TKA for SPONK or OA with ≥ 5-year follow-up. Patients who had sickle cell disease, human immunodeficiency virus, and corticosteroid usage were excluded. A total of 43,680 patients were included (7,282 patients with SPONK 1:5 ratio matched to 36,398 patients with OA by age, sex, and comorbidities). Primary outcomes were 2- and 5-year implant-related complications. Multivariable logistic regressions computed the odds ratios (OR) of implant complications. $P<0.001$ was significant.

RESULTS:

At two-year follow-up, patients undergoing TKA for SPONK had significantly higher incidences and odds of aseptic loosenings (1.15 versus 0.76%; OR:1.52, $P=0.0008$) and all-cause revisions (3.36 versus 2.48%; OR:1.37, $P=0.0001$) compared to those undergoing TKA for OA. PJIs ($P=0.006$) and periprosthetic fractures ($P=0.004$) were similar between groups. At five-year follow-up, patients who had SPONK had significantly higher incidence and odds of aseptic loosenings (2.61 versus 1.62%; OR:1.63, $P=0.0001$), periprosthetic fractures (0.70 versus 0.33%; OR:2.15, $P=0.0001$), PJIs (3.54 versus 2.68%; OR:1.33, $P=0.0001$), and all-cause TKA revisions (5.63 versus 3.88%; OR:1.48, $P=0.0001$).

DISCUSSION AND CONCLUSION:

Patients undergoing TKA over the age of 50 years for SPONK face an increased risk of implant-related complications compared to those with OA. Arthroplasty surgeons should consider these findings when indicating patients for SPONK versus OA in this patient population.

	Osteonecrosis N (%)	Osteoarthritis N (%)	OR	95% CI	*P*-value
PJIs	173 (2.38)	684 (1.88)	1.31	1.07– 1.50	0.006
Periprosthetic Fractures	28 (0.38)	73 (0.20)	1.92	1.24 – 2.97	0.004
Aseptic Loosenings	84 (1.15)	276 (0.76)	1.52	1.19 – 1.95	**0.0008**
All-Cause Revisions	245 (3.36)	904 (2.48)	1.37	1.18 – 1.58	**0.0001**

Table 1. Comparison of 2-Year Total Knee Arthroplasty (TKA) Implant Complications for Osteonecrosis versus Osteoarthritis Patients

OR = Odds-Ratio; 95% CI = 95% Confidence Interval
PJI= Peri-prosthetic joint infection
Reference is patients who had osteoarthritis
Bold values denote statistical significance to the $P < 0.001$ level

	Osteonecrosis N (%)	Osteoarthritis N (%)	OR	95% CI	*P*-value
PJIs	258 (3.54)	976 (2.68)	1.33	1.16 – 1.53	**0.0001**
Periprosthetic Fractures	51 (0.70)	119 (0.33)	2.15	1.55 – 2.99	**0.0001**
Aseptic Loosenings	190 (2.61)	588 (1.62)	1.63	1.38 – 1.93	**0.0001**
All-Cause Revisions	410 (5.63)	1414 (3.88)	1.48	1.32 – 1.65	**0.0001**

Table 2. Comparison of 5-Year Total Knee Arthroplasty (TKA) Implant Complications for Osteonecrosis versus Osteoarthritis Patients

OR = Odds-Ratio; 95% CI = 95% Confidence Interval
PJI= Peri-prosthetic joint infection
Reference is patients who had osteoarthritis
Bold values denote statistical significance to the $P < 0.001$ level