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Background

Prosthetic joint infection (PJI) in total knee arthroplasty (TKA) is associated with substantial morbidity, mortality, and healthcare burden. While prolonged operative time is frequently cited as a modifiable risk factor, the strength of this association in routine primary TKA remains uncertain. This study investigates the relationship between surgical duration and the incidence of PJI in routine primary TKA.

Methods

A retrospective cohort study included 223 consecutive unilateral primary TKAs performed at a single institution between January 2022 and March 2023. Cases were stratified by operative time, with prolonged duration defined as ≥120 minutes. Patient demographics, operative variables, and post-operative outcomes were collected, and potential risk factors for PJI were evaluated through subgroup analyses.

Results

The cohort (mean age 68.9 ± 6.5 years; BMI 28.1 ± 4.7 kg/m²) was 65.0% female (n=145), with 63.2% (n=141) having Kellgren-Lawrence Grade 4 osteoarthritis. Mean operative duration was 117.3 ± 66.2 minutes (85.3 ± 20.3 in the <120-minute group [n=160]; 197.0 ± 73.3 in the ≥120-minute group [n=63]). Demographics did not differ significantly between groups (age p=0.48, BMI p=0.59, gender p=0.87, Kellgren-Lawrence p=0.305). The overall PJI incidence was 1.35% (n=3), with two cases in the <120-minute group and one in the ≥120-minute group. Firth penalised logistic regression revealed no significant difference in PJI rates between groups (OR 1.49, 95% CI 0.13-11.41; likelihood-ratio p=0.708). All affected patients were female, obese, and had severe osteoarthritis; two also had chronic diabetes mellitus.

Conclusion

Overall rates of PJI after routine primary TKA were low, and prolonged operative duration was not associated with increased odds of PJI in this cohort. Routine TKA should not be unnecessarily expedited in an attempt to reduce PJI risk. Instead, comprehensive pre-operative risk stratification and optimisation of modifiable risk factors should be prioritised, supported by adherence to sound intra-operative principles, including good surgical technique, meticulous soft-tissue handling, evidence-based antibiotic prophylaxis, and established infection-prevention protocols.

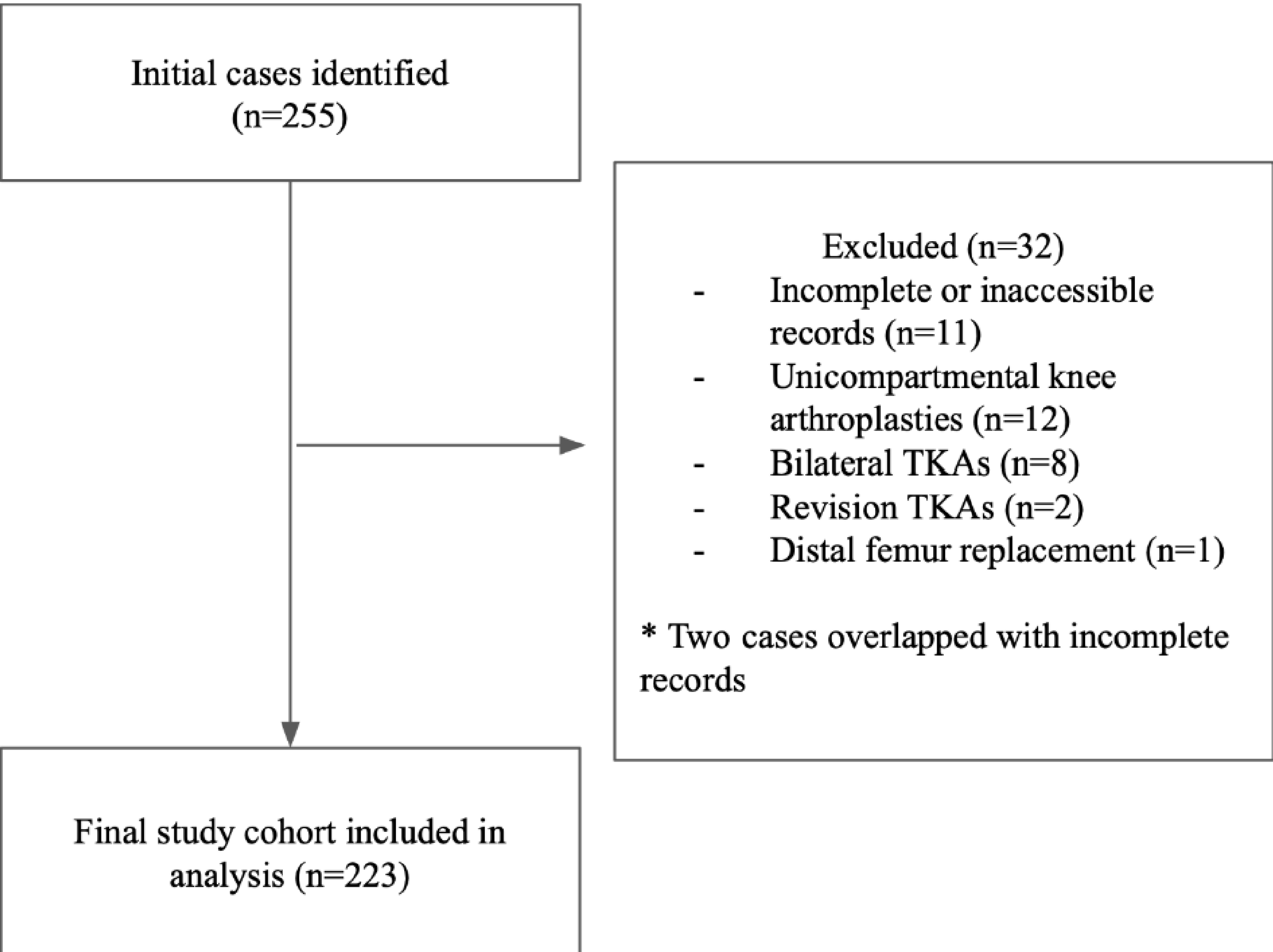


Fig 1. Flow chart of patient selection for study

Characteristic	Overall (n=223)	<120 min (n=160)	≥120 min (n=63)	p-value
Age, years (mean ± SD)	68.9 ± 6.5	69.0 ± 6.6	68.6 ± 6.5	0.483
Sex, n (%)				0.867
Female	145 (65.0)	103 (64.4)	42 (66.7)	
Male	78 (35.0)	57 (35.6)	21 (33.3)	
BMI, kg/m² (mean ± SD)	28.1 ± 4.7	28.0 ± 4.7	28.3 ± 4.7	0.591
Kellgren-Lawrence grade, n (%)				0.305
Grade 2	2 (0.9)	2 (1.2)	0 (0.0)	
Grade 3	76 (34.1)	59 (36.9)	17 27.0)	
Grade 4	141 (63.2)	97 (60.6)	44 (69.8)	
Risk factor, n (%)				
Diabetes mellitus	69 (30.9)	50 (31.2)	19 (30.2)	1.000
Chronic venous insufficiency	2 (0.9)	1 (0.6)	1 (1.6)	1.000
Cellulitis	1 (0.4)	1 (0.6)	0 (0.0)	1.000
Chronic steroid use	11 (5.0)	7 (4.4)	4 (6.3)	0.795
Pre-operative anaemia	56 (25.1)	44 (27.5)	12 (19.0)	0.255

Table 1. Baseline cohort characteristics