

Supplementary data

Table 1. Patient and surgical factors before and after propensity score matching. Values are frequency (%) unless otherwise specified

| Covariate | Unmatched cohort | | | SMD | Matched cohort | | | SMD |
|----------------------------|------------------------|-------------------------------|--------------------------------|------|------------------------|------------------------------|--------------------------------|---------|
| | All UKRs n = 40,522 | Cemented 76% n = 30,814 | Cementless 24% n = 9,708 | | All UKRs n = 14,814 | Cemented 50% n = 7,407 | Cementless 50% n = 7,407 | |
| Sex | | | | | | | | |
| Female | 18,775 (46.3) | 14,707 (47.7) | 4,068 (41.9) | 0.12 | 6,155 (41.6) | 3,077 (41.5) | 3,078 (41.6) | < 0.001 |
| Male | 21,747 (53.7) | 16,107 (52.3) | 5,640 (58.1) | | 8,659 (58.4) | 4,330 (58.5) | 4,329 (58.4) | |
| Age at surgery | | | | | | | | |
| Mean (SD) | 64.7 (9.5) | 64.7 (9.5) | 64.8 (9.5) | 0.01 | 64.7 (9.5) | 64.6 (9.6) | 64.7 (9.5) | 0.003 |
| BMI (cases) | 26,966 | 18,669 | 8,297 | | 11,801 | 5,565 | 6,236 | |
| Mean (SD) | 30.2 (5.0) | 30.2 (5.0) | 30.4 (5.2) | 0.04 | 30.3 (5.0) | 30.2 (4.9) | 30.4 (5.2) | 0.05 |
| Primary diagnosis | | | | | | | | |
| Primary OA | 40,059 (98.9) | 30,474 (98.9) | 9,585 (98.7) | 0.02 | 14,633 (98.8) | 7,314 (98.7) | 7,319 (98.8) | 0.006 |
| Other | 463 (1.1) | 340 (1.1) | 123 (1.3) | | 181 (1.2) | 93 (1.3) | 88 (1.2) | |
| Bilateral UKRs | 1,325 (3.3) | 874 (2.8) | 451 (4.6) | 0.1 | 493 (3.3) | 245 (3.3) | 248 (3.4) | 0.002 |
| ASA grade | | | | | | | | |
| 1 | 8,441 (20.8) | 6,321 (20.5) | 2,120 (21.8) | 0.05 | 3,025 (20.4) | 1,536 (20.7) | 1,489 (20.1) | 0.02 |
| 2 | 28,687 (70.8) | 21,983 (71.3) | 6,704 (69.1) | | 10,499 (70.9) | 5,227 (70.6) | 5,272 (71.2) | |
| 3 or above | 3,394 (8.4) | 2,510 (8.1) | 884 (9.1) | | 1,290 (8.7) | 644 (8.7) | 646 (8.7) | |
| VTE—chemical | | | | | | | | |
| LMWH (± other) | 23,789 (58.7) | 17,561 (57.0) | 6,228 (64.2) | 0.40 | 9,311 (62.9) | 4,624 (62.4) | 4,687 (63.3) | 0.02 |
| Aspirin only | 5,158 (12.7) | 4,152 (13.5) | 1,006 (10.4) | | 1,446 (9.8) | 727 (9.8) | 719 (9.7) | |
| Other | 7,747 (19.1) | 5,496 (17.8) | 2,251 (23.2) | | 3,641 (24.6) | 1,851 (25.0) | 1,790 (24.2) | |
| None | 3,828 (9.5) | 3,605 (11.7) | 223 (2.3) | | 416 (2.8) | 205 (2.8) | 211 (2.8) | |
| VTE—mechanical | | | | | | | | |
| Any | 38,947 (96.1) | 29,316 (95.1) | 9,631 (99.2) | 0.25 | 14,662 (99.0) | 7,332 (99.0) | 7,330 (99.0) | 0.003 |
| None | 1,575 (3.9) | 1,498 (4.9) | 77 (0.8) | | 152 (1.0) | 75 (1.0) | 77 (1.0) | |
| Year of surgery | | | | | | | | |
| 2005 | 1,108 (2.7) | 1,100 (3.6) | 8 (0.1) | 1.32 | 17 (0.1) | 9 (0.1) | 8 (0.1) | 0.18 |
| 2006 | 1,929 (4.8) | 1,889 (6.1) | 40 (0.4) | | 78 (0.5) | 38 (0.5) | 40 (0.5) | |
| 2007 | 2,730 (6.7) | 2,702 (8.8) | 28 (0.3) | | 89 (0.6) | 61 (0.8) | 28 (0.4) | |
| 2008 | 3,426 (8.5) | 3,344 (10.9) | 82 (0.8) | | 229 (1.6) | 147 (2.0) | 82 (1.1) | |
| 2009 | 3,721 (9.2) | 3,460 (11.2) | 261 (2.7) | | 499 (3.4) | 238 (3.2) | 261 (3.5) | |
| 2010 | 3,660 (9.0) | 3,256 (10.6) | 404 (4.2) | | 752 (5.1) | 349 (4.7) | 403 (5.4) | |
| 2011 | 3,652 (9.0) | 3,013 (9.8) | 639 (6.6) | | 1,054 (7.1) | 417 (5.6) | 637 (8.6) | |
| 2012 | 3,680 (9.1) | 2,962 (9.6) | 718 (7.4) | | 1,400 (9.5) | 695 (9.4) | 705 (9.5) | |
| 2013 | 3,582 (8.8) | 2,622 (8.5) | 960 (9.9) | | 1,860 (12.6) | 996 (13.4) | 864 (11.7) | |
| 2014 | 4,182 (10.3) | 2,637 (8.6) | 1,545 (15.9) | | 2,762 (18.6) | 1,500 (20.3) | 1,262 (17.0) | |
| 2015 | 4,303 (10.6) | 2,112 (6.9) | 2,191 (22.6) | | 3,083 (20.8) | 1,528 (20.6) | 1,555 (21.0) | |
| 2016 | 4,549 (11.2) | 1,717 (5.6) | 2,832 (29.2) | | 2,991 (20.2) | 1,429 (19.3) | 1,562 (21.1) | |
| Surgeon grade | | | | | | | | |
| Consultant | 36,346 (89.7) | 27,775 (90.1) | 8,571 (88.3) | 0.06 | 13,310 (89.8) | 6,688 (90.3) | 6,622 (89.4) | 0.03 |
| Other | 4,176 (10.3) | 3,039 (9.9) | 1,137 (11.7) | | 1,504 (10.2) | 719 (9.7) | 785 (10.6) | |
| Surgeon caseload/year | | | | | | | | |
| < 10 | 16,130 (39.8) | 13,474 (43.7) | 2,656 (27.4) | 0.43 | 4,691 (31.7) | 2,327 (31.4) | 2,364 (31.9) | 0.01 |
| 10 to < 30 | 16,785 (41.4) | 12,685 (41.2) | 4,100 (42.2) | | 6,664 (45.0) | 3,336 (45.0) | 3,328 (44.9) | |
| ≥ 30 | 7,607 (18.8) | 4,655 (15.1) | 2,952 (30.4) | | 3,459 (23.4) | 1,744 (23.5) | 1,715 (23.2) | |
| Surgical approach | | | | | | | | |
| Medial parapatellar | 37,052 (91.4) | 28,154 (91.4) | 8,898 (91.7) | 0.01 | 13,649 (92.1) | 6,827 (92.2) | 6,822 (92.1) | 0.003 |
| Other | 3,470 (8.6) | 2,660 (8.6) | 810 (8.3) | | 1,165 (7.9) | 580 (7.8) | 585 (7.9) | |
| Minimally invasive surgery | | | | | | | | |
| No | 21,076 (52.0) | 16,287 (52.9) | 4,789 (49.3) | 0.07 | 7,600 (51.3) | 3,796 (51.3) | 3,804 (51.4) | 0.002 |
| Yes | 19,446 (48.0) | 14,527 (47.1) | 4,919 (50.7) | | 7,214 (48.7) | 3,611 (48.8) | 3,603 (48.6) | |
| Femoral component size | | | | | | | | |
| Extra small | 89 (0.2) | 47 (0.2) | 42 (0.4) | 0.14 | 47 (0.3) | 26 (0.4) | 21 (0.3) | 0.02 |
| Small | 9,408 (23.2) | 6,904 (22.4) | 2,504 (25.8) | | 3,479 (23.5) | 1,752 (23.7) | 1,727 (23.3) | |
| Medium | 21,214 (52.4) | 16,608 (53.9) | 4,606 (47.4) | | 7,280 (49.1) | 3,617 (48.8) | 3,663 (49.5) | |
| Large | 9,700 (23.9) | 7,171 (23.3) | 2,529 (26.1) | | 3,970 (26.8) | 1,990 (26.9) | 1,980 (26.7) | |
| Extra large | 111 (0.3) | 84 (0.3) | 27 (0.3) | | 38 (0.3) | 22 (0.3) | 16 (0.2) | |

Table 1. Continued.

| Covariate | Unmatched cohort | | | SMD | Matched cohort | | | SMD |
|-----------------------|------------------------|-------------------------------|--------------------------------|-----------|------------------------|------------------------------|--------------------------------|-------|
| | All UKRs n = 40,522 | Cemented 76% n = 30,814 | Cementless 24% n = 9,708 | | All UKRs n = 14,814 | Cemented 50% n = 7,407 | Cementless 50% n = 7,407 | |
| Tibial component size | | | | | | | | |
| AA | 130 (0.3) | 93 (0.3) | 37 (0.4) | 0.37 | 58 (0.4) | 29 (0.4) | 29 (0.4) | 0.01 |
| A | 3,805 (9.4) | 3,453 (11.2) | 352 (3.6) | | 679 (4.6) | 336 (4.5) | 343 (4.6) | |
| B | 9,158 (22.6) | 7,288 (23.7) | 1,870 (19.3) | | 2,994 (20.2) | 1,513 (20.4) | 1,481 (20.0) | |
| C | 11,576 (28.6) | 8,769 (28.5) | 2,807 (28.9) | | 4,284 (28.9) | 2,137 (28.9) | 2,147 (29.0) | |
| D | 9,668 (23.9) | 7,098 (23.0) | 2,570 (26.5) | | 3,965 (26.8) | 1,974 (26.7) | 1,991 (26.9) | |
| E | 4,753 (11.7) | 3,216 (10.4) | 1,537 (15.8) | | 2,179 (14.7) | 1,095 (14.8) | 1,084 (14.6) | |
| F | 1,432 (3.5) | 897 (2.9) | 535 (5.5) | 655 (4.4) | 323 (4.4) | 332 (4.5) | | |
| Bearing type | | | | | | | | |
| Anatomic | 32,708 (80.7) | 23,301 (75.6) | 9,407 (96.9) | 0.65 | 14,198 (95.8) | 7,092 (95.8) | 7,106 (95.9) | 0.009 |
| Symmetric | 7,814 (19.3) | 7,513 (24.4) | 301 (3.1) | | 616 (4.2) | 315 (4.3) | 301 (4.1) | |
| Bearing size | | | | | | | | |
| 3 | 9,269 (22.9) | 6,226 (20.3) | 3,003 (30.9) | 0.37 | 4,056 (27.4) | 2,056 (27.8) | 2,000 (27.0) | 0.02 |
| 4 | 16,219 (40.0) | 12,126 (39.4) | 4,093 (42.2) | | 6,288 (42.5) | 3,128 (42.2) | 3,160 (42.7) | |
| 5 | 8,552 (21.1) | 6,765 (22.0) | 1,787 (18.4) | | 2,942 (19.9) | 1,459 (19.7) | 1,483 (20.0) | |
| 6 | 3,846 (9.5) | 3,268 (10.6) | 578 (6.0) | | 1,042 (7.0) | 519 (7.0) | 523 (7.1) | |
| 7 | 1,667 (4.1) | 1,506 (4.9) | 161 (1.7) | | 306 (2.1) | 150 (2.0) | 156 (2.1) | |
| 8 | 620 (1.5) | 563 (1.8) | 57 (0.6) | | 118 (0.8) | 62 (0.8) | 56 (0.8) | |
| 9 | 349 (0.9) | 320 (1.0) | 29 (0.3) | 62 (0.4) | 33 (0.4) | 29 (0.4) | | |
| Bone graft | | | | | | | | |
| No | 40,374 (99.6) | 30,745 (99.8) | 9,629 (99.2) | 0.08 | 14,758 (99.6) | 7,377 (99.6) | 7,381 (99.7) | 0.009 |
| Yes | 148 (0.4) | 69 (0.2) | 79 (0.8) | | 56 (0.4) | 30 (0.4) | 26 (0.4) | |

Abbreviations: ASA = American Society of Anesthesiologists score, BMI = body mass index, OA = osteoarthritis, SD = standard deviation, SMD = standardized mean difference, UKR = unicompartmental knee replacement, VTE = venous thromboembolism.

Table 2. Reasons for revision in the matched cohort

| Revision indication | All UKRs (n = 14,814) n (%) | Cemented UKRs (n = 7,407) n (%) | Time to revision indication mean (SD) | Cementless UKRs (n = 7,407) n (%) | Time to revision indication mean (SD) | p-value ^a |
|--------------------------------------|-----------------------------------|---------------------------------------|---|---|---|----------------------|
| Aseptic loosening ^b | 105 (0.71) | 74 (1.00) | 1.5 (2.1) | 31 (0.42) | 2.0 (2.0) | < 0.001 |
| OA progression | 127 (0.86) | 72 (0.97) | 3.5 (2.5) | 55 (0.74) | 3.7 (2.0) | 0.1 |
| Pain ^b | 89 (0.60) | 55 (0.74) | 2.8 (2.1) | 34 (0.46) | 2.0 (1.5) | 0.03 |
| Other | 70 (0.47) | 41 (0.55) | 2.5 (2.0) | 29 (0.39) | 2.0 (1.3) | 0.2 |
| Dislocation/subluxation | 49 (0.33) | 28 (0.38) | 1.6 (1.6) | 21 (0.28) | 1.2 (1.2) | 0.4 |
| Instability | 33 (0.22) | 13 (0.18) | 2.9 (1.3) | 20 (0.27) | 1.9 (1.9) | 0.3 |
| Component dissociation | 29 (0.20) | 13 (0.18) | 1.4 (1.1) | 16 (0.22) | 2.2 (2.1) | 0.6 |
| Malalignment | 37 (0.25) | 13 (0.18) | 1.2 (0.9) | 24 (0.32) | 1.8 (1.4) | 0.1 |
| Infection | 28 (0.19) | 15 (0.20) | 1.9 (2.1) | 13 (0.18) | 1.8 (1.8) | 0.8 |
| Periprosthetic fracture ^b | 26 (0.18) | 7 (0.09) | 1.0 (0.9) | 19 (0.26) | 1.0 (2.4) | 0.01 |
| Lysis ^b | 14 (0.09) | 11 (0.15) | 2.5 (1.4) | 3 (0.04) | 1.6 (1.0) | 0.03 |
| Wear | 14 (0.09) | 7 (0.09) | 4.0 (2.8) | 7 (0.09) | 3.5 (2.9) | 1.0 |
| Stiffness | 12 (0.08) | 5 (0.07) | 1.6 (0.6) | 7 (0.09) | 1.4 (1.0) | 0.7 |
| Implant fracture | 1 (0) | 1 (0.01) | 2.0 | 0 (0) | N/A | No revisions |
| Patellar wear | 0 (0) | 0 (0) | N/A | 0 (0) | N/A | No revisions |
| Tibial wear | 0 (0) | 0 (0) | N/A | 0 (0) | N/A | No revisions |
| Incorrect sizing | 0 (0) | 0 (0) | N/A | 0 (0) | N/A | No revisions |
| Patellar mal tracking | 0 (0) | 0 (0) | N/A | 0 (0) | N/A | No revisions |

^a Comparisons between the frequency of revision indications were conducted using the chi-square test.

^b Refers to revision indications that were statistically significantly different between cementless and cemented implants.

Abbreviations: OA = osteoarthritis, UKR = unicompartmental knee replacement.