Kantonsspital St.Gallen

Blackburne-Peel ratio predicts patients' outcomes after total knee arthroplasty

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PURPOSE
Alterations in patellar height and posterior tibial slope (PTS) are frequently measured radiographic parameters associated with postoperative impairments after total knee arthroplasty (TKA). Few studies correlate the clinical outcome of TKA with the radiological indices. Both the modified Insall-Salvati ratio (mISR) and the Blackburne-Peel ratio (BPR) were hypothesised to correlate with the clinical outcome after TKA.

METHODS
A total of 282 computer navigated primary LCS-TKAs, implanted in our institution from 2008 to 2012, were included. Data (ROM, FJS-12, WOMAC, and revision surgery) were collected independently and prospectively. Patellar height (mISR, BPR), joint-line position, and PTS were measured on pre- and postoperative radiographs. Bivariate and multiple regression analyses were performed.

RESULTS
Mean mISR (1.5-1.4) and BPR (0.8-0.6) decreased from preoperatively to 1 year follow-up. Mean joint-line shift in a cranial direction was 2 mm after TKA implantation. Analysis of dichotomous variables (presence of PB and PPB or not) only showed significantly lower flexion in patients with PPB ($p < 0.001$). However, multiple regression revealed that BPR was a significant positive independent predictor for FJS-12 ($p = 0.016$) and flexion ($p < 0.001$) at 1 year follow-up. Postoperative PTS ($p < 0.01$) and initial patella height ($p < 0.001$) were both predictive for BPR at follow-up, while the joint-line height was not.

CONCLUSIONS
The BPR is a useful and reliable radiographic parameter to predict patient outcomes 1 year after primary navigated TKA. Lowering the BPR should be avoided, as this may lead to significant restrictions in terms of ROM and PROMs.

LEVEL OF EVIDENCE
Level 3.

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