

Response to: 'Infrapatellar fat pad resection during total knee replacement: yet another reason?' by Ryan

We thank Ryan¹ for the interest in our original paper² and response³ regarding to the associations between infrapatellar fat pad (IPFP) maximal area and knee osteoarthritic measures including symptoms and structural changes.

Our previous studies revealed that IPFP maximal area and volume were associated with reduced knee pain, decreased loss of cartilage volume and reduced risks of cartilage defect progression, indicating a beneficial effect of IPFP size.^{2,4} On the other hand, our further investigation demonstrated that IPFP signal intensity alteration was negatively associated with maximum area of IPFP and, moreover, associated with increased knee cartilage defects, subchondral bone marrow lesions and knee pain, suggesting IPFP with abnormal quality may play a detrimental role in knee osteoarthritis (OA).⁵

Based on these findings, we proposed that IPFP with normal qualities, rather than abnormal quality, should be preserved or not damaged during total knee arthroplasty (TKA), while IPFP with abnormal quality should be resected rather than preserved. Because of the biphasic effects of IPFP on OA, a proposed solution for improving patient outcomes after TKA involves using screening MRIs to identify IPFP signal intensity alteration, which is a subsequent indication for resection during TKA surgeries.³ This approach is not 'contrary' to approach offered by Sekiya,⁶ which suggested the use of postarthroplasty arthroscopic IPFP debridement. Moreover, the underlying rationales of two solutions are similar, despite different timing. Han *et al*⁵ also suggested that IPFP screening has the potential to reduce reoperation and perhaps reduce morbidity of severe knee pain post-TKA beyond 2%.

Patellar tendon shortening could be one of the reasons for post-TKA anterior knee pain as findings from Gwyn *et al*'s retrospective study⁷ reported that complete IPFP resection was associated with patellar tendon shortening 1 year after TKA. The authors had noted that studies also reporting IPFP excision during TKA did not alter the patellar tendon length.^{8,9} Despite the inconclusive effect of IPFP resection on patellar tendon shortening, the protective effect of normal IPFP on knee may be largely attributed to buffering and lubricating functions in knee joints, which absorb shocks from anterior knee and reduce friction between patellar tendon and tibia.^{10,11}

The authors agree that correct fitting of components is critical for favourable TKA outcomes. Traditionally, the IPFP has been removed in order to improve surgical exposure and to prevent interposition during baseplate implantation.¹² Despite the significant evolution of TKA technology that no longer requires the resection of IPFP for better surgical access, IPFP is still partially or totally resected in around 88% of TKAs¹³ regardless of IPFP quality. Thus, evidence-based changes of practice towards preoperative IPFP evaluation and subsequent indication for resection or preservation are eagerly needed.

As for whether insufficient debridement of IPFP can cause anterior knee pain, our original cohort study was not able to provide an answer. We acknowledge that our findings, along with findings from our recent articles,^{4,5} were observational and there is not enough evidence to support preservation or resection of IPFP during TKA for patients with OA at very

late stage. So far, there is no evidence to support the assumption that it is insufficient debridement, not the decision to debride the IPFP, that results in anterior knee pain.

In summary, our previous observational studies have suggested biphasic effects of IPFP on OA. In order to implement evidence-based changes of practice, well-designed randomised controlled trials are urgently required to test this hypothesis: preserve IPFP with normal quality and resect IPFP with pathological changes showing on MRI (signal intensity alterations) during TKA may have beneficial effects on patients' postsurgical outcomes.

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