Biological internal bracing with remnant repair allows the “best of both worlds” for subacute ACL femoral avulsions.

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PII: S2059-7754(23)00556-4
DOI: https://doi.org/10.1016/j.jisako.2023.09.001
Reference: JISAKO 158

To appear in: Journal of ISAKOS

Received Date: 27 August 2023
Accepted Date: 5 September 2023

Please cite this article as: Pardiwala DN, Lee D, Biological internal bracing with remnant repair allows the “best of both worlds” for subacute ACL femoral avulsions., Journal of ISAKOS, https://doi.org/10.1016/j.jisako.2023.09.001.

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RESPONSE TO A LETTER TO THE EDITOR : JISAKOS-D-23-00134

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We thank the authors of the letter ‘Anterior cruciate ligament primary repair is a valid treatment option for proximal tears with good to excellent tissue quality in the acute, sub-acute and delayed setting.’ for their interest in our video article and for giving us an opportunity to further discuss this contentious topic. The authors have offered constructive recommendations based on their experience with ACL preservation, and have discussed their reasons for propagating repair in all proximal anterior cruciate ligament (ACL) tears with good tissue quality irrespective of duration of injury.

Our video article which focuses on surgical technique [1] with a limit of 1000 words and 10 references could not acknowledge previous publications that advocate a “preservation first approach”. Authors have previously described combined repair with augmentation for ACL proximal tears, however, these techniques focus on synthetic augmentation with sutures and tapes [2,3,4], bundle specific reconstructions for partial ACL tears [5], or remnant sparing ACL reconstruction techniques [6,7,8]. The technique described in our video article is a modification of previously described techniques in that the augmentation is biological and it is indicated for complete ACL avulsions (Sherman Type 1 and 2 tears). The graft for biological internal bracing should be large enough to ‘reconstruct’ the ACL; but not so large that it disrupts the anterior tibial insertion, or occupies the entire femoral footprint in Type I avulsions (where remnant healing to femoral footprint is desired), or causes notch impingement. The different methods we use to repair the ACL depend on the type of ACL avulsion and stability of the remnant ACL stump, and are discussed in detail in our article. In each technique, the focus is to preserve the unique fan shaped tibial insertion of ACL which is not possible to recreate using present reconstruction techniques.

The optimal timing for surgery following an acute ACL tear is a topic of controversy. Following Shelbourne’s landmark studies that reported an increased risk of arthrofibrosis in acutely reconstructed ACL tears [9,10], numerous authors concluded that the risk of developing a stiff knee after surgery can be significantly reduced if the surgery is delayed until the acute inflammatory phase has passed, the swelling has subsided, and a normal or near normal range of motion (especially extension) has been obtained [11]. On the other hand, recent studies with modern rehabilitation protocols suggest that acute ACL surgery is not associated with an increased risk of postoperative stiffness [12,13]. It is important to appreciate that most of these studies are either controlled trials with supervised rehabilitation which may be difficult to consistently replicate in “real world orthopaedics”, or retrospective studies with a potential selection bias [14]. We appreciate that some ACL tears with minimal knee inflammation may be appropriate for surgery in the acute phase, but would caution...
against performing acute ACL surgery when the knee is swollen, painful, and has a limited range of motion.

‘Early repair leads to more predictable healing’ is an intuitive dictum in orthopaedics and is seen not just in bones, muscles-tendons, and menisci, but also in ligaments [15]. The ACL is not likely to be an exception. Although the mechanisms behind the functional loss of healing with delay of repair remain unknown [16], several studies have advocated for early repair to optimise healing rates and clinical outcomes [16,17,18,19]. We respect the authors preference to repair chronic ACL avulsions in patients with good quality tissue based on the results of the quoted study [14]. However, since this is a retrospective study with limitations (the study was underpowered to determine the secondary outcome measure of treatment failure, and 21% of the patients operated in the acute group were lost to follow-up) we would not advocate the same for general use as of now. With the evidence available today, most surgeons would be apprehensive of offering repair to sub-acute and chronic ACL avulsions despite good macroscopic tissue quality during arthroscopy.

In conclusion, prospective studies with sufficient follow-up comparing the outcomes and failure rates of ACL repair versus reconstruction are needed prior to widespread implementation of ACL repair [20]. In the absence of this higher level of evidence, the ‘ongoing reluctance toward ACL primary repair within today’s orthopaedic sports medicine and trauma community’ [21] is likely to persist. Under these circumstances, there is a need for a “best of both worlds” approach that allows gold-standard ACL reconstruction to be performed along with all the potential advantages of ACL repair. In our opinion, arthroscopic biological internal bracing with remnant repair for subacute ACL femoral avulsions [1] fulfils this need.
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Financial grants received for this study: None

Financial renumeration / biases for any author: None

Declaration of interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.