

Peer Review File

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Reviewer A

The technique is well described and only what is really missing is a clinical message for the surgeons:

report a table with clear indications for this type of surgery

Reply: We added the table 2 as suggested.

report the clinical implication, how can this technique help in clinical daily practice

Reply:

This part has been improved in the Highlight Box:

“By providing a comprehensive and detailed description of the pie-crust technique, this study empowers surgeons to consistently and effectively utilize it. Therefore, this technique must be established as a standard approach for treating medial compartment injuries in knee arthroscopy procedures. Surgeons should acquaint themselves with this technique to enhance patient outcomes and ensure its consistent use across the surgical community.”

add a table with tips and tricks

Reply: We added the table 1 as suggested.

references: please add following:D'Ambrosi R, Corona K, Guerra G, Cerciello S, Ursino C, Ursino N, Hantes M. Posterior oblique ligament of the knee: state of the art. EFORT Open Rev. 2021 May 4;6(5):364-371. doi: 10.1302/2058-5241.6.200127. PMID: 34150330; PMCID: PMC8183151.

D'Ambrosi R, Corona K, Guerra G, Rubino M, Di Feo F, Ursino N. Biomechanics of the posterior oblique ligament of the knee. Clin Biomech (Bristol, Avon). 2020 Dec;80:105205. doi: 10.1016/j.clinbiomech.2020.105205. Epub 2020 Nov 2. PMID: 33158574.

Reply: Suggested references have been added.

Reviewer B

How does your description differ from previously described techniques in the literature?

Reply:

This study makes a significant contribution to the existing literature by providing a comprehensive and detailed description of the pie-crusting technique. This level of detail empowers surgeons with a clear understanding of how to consistently and effectively utilize the technique. Consequently, it serves as a strong argument for establishing the pie-crusting technique as a standard approach for treating medial compartment injuries in knee arthroscopy procedures. The study's emphasis on clarity and comprehensiveness in describing the technique not only benefits experienced surgeons but also provides a valuable resource for those who may be less familiar with it. By doing so, it promotes a wider adoption of the technique within the surgical community. In essence, this study equips surgeons with the knowledge and guidance needed to enhance patient outcomes by ensuring the consistent and informed use of the pie-crusting technique. Its contribution lies not only in the technique itself but in the accessibility of this valuable knowledge to the broader surgical community.

Please see the main text for the edits.

More thorough description of Pie-crusting technique is required with reference to avoiding dangerous structures (saphenous nerve). How deep do you pass the needle? How can you perform procedure safely if landmarks are not easily palpable.? How do you know when. you have achieved enough opening. Is it possible to over-release - how can this be avoided.

Reply:

Required and extensive sections have been added.

In particular, a section on potentially damaging structures has been added with specific attention to the saphenous nerve.

The depth of the needle is up to the "popping" or "crunching" sensation.

We proceed safely based on the markers that are palpated well at the beginning of the procedure as described.

The opening is sufficient when the surgeon's view of the medial compartment is improved, as described in the text.

Over-release should be avoided by precisely following the technique as described in the corrected text and newly added tables.

Please see the main text for the edits.

Anatomical / cadaveric discussion of the location of saphenous vein and nerve are required. Is the POL released? Is the deep MCL released?

Reply:

The required anatomical section on saphenous vein and nerve was added. The release included the MCL in its entirety, as has been modified throughout.

Please see the main text for the edits.

Line 138 - requires reference.

Reply:

Missing references have been added.

Line 116 - what are gentle punctures - how deep (to bone, joint, less so??), what does it feel like to surgeon (usually described as gritty as needle passes in sMCL)

Reply:

The depth of the needle is up to the "popping" or "crunching" sensation.

Please see the main text for the edits:

“While observing the medial compartment under arthroscopic view, a 16 or 18-G needle is percutaneously inserted into the previously described area. To verify the posteromedial corner of the tibial plateau, utilize the needle, which is positioned in a submeniscal manner at this site. This positioning should align with the junction between the body and the posterior horn of the medial meniscus, and gentle punctures from posterior to anterior over the fibers of the MCL are performed from a single access point at various locations within the targeted area. Over time, it will develop a heightened somatosensory perception for the tactile feedback associated with fiber release, characterized by sensations akin to "popping" or "crunching." This heightened sensitivity facilitates precise adjustment of the release procedure (Figure 5).

During this procedure, the orthopedic surgeon must maintain a moderate valgus strain of the knee at 20° of flexion [11-13].”

How much pressure required with vagus force??

Reply:

Please see the main text for the edits:

“During this procedure, the orthopedic surgeon must maintain a moderate valgus strain of the knee at 20° of flexion”

Discussion of possible contra-indications to procedure required (valgus alignment, prior distal MCL injury, concurrent lateral compartment pathology, inflammatory arthropathy, obese patients)

Reply:

This part has been included in the text.

Please see the main text for the edits.

“No absolute contraindications to the MCL pie-crusting procedure are described in the literature [26,27]. Relative contraindications include diagnosing the occurrence in the knee's lateral compartment. If there are concomitant disorders in this area, MCL pie-crusting could result in deteriorating knee valgus. Also, patients with a history of preexisting MCL injury should be carefully considered, as MCL pie-crusting could result in an increased risk of further damage or complications in this already compromised area. Inflammatory arthropathy, such as rheumatoid arthritis, may significantly affect joint stability and susceptibility to ligamentous injury. Therefore, pie-crusting may not be the best choice in these cases. Finally, in obese patients, the extra load on the knee may increase the risk of postoperative complications. Therefore, contraindications related to MCL pie-crusting require thorough patient evaluation and individualized planning to ensure the most appropriate treatment and minimize associated risks [26-28]. Table 2 reported the advantages and disadvantages associated with the MCL pie-crusting technique described.”

Include- known complications - MCL over-release and Saphenous nerve injury.

Reply:

This part has been included in the text.

Please see the main text for the edits.

“Complications such as MCL over-release, pain and damage to surrounding structures caused by percutaneous MCL pie-crusting were addressed in several studies [18-21]. Patients usually describe mild medial compartment pain during the first two weeks postoperatively. However, no significant differences in pain intensity were found between patients who underwent percutaneous MCL release and those who did not receive it [20]. Regarding soft tissue injuries, particularly of the saphenous nerve and great saphenous vein (GSV), no statistically significant correlation was observed between these injuries and the per-cutaneous MCL pie-crusting technique; therefore, these lesions appear infrequent during the procedure, and the risk of injury is rare because the area where the percutaneous release is performed is far from nerve and vascular structures [19-22].”

Other articles to consider and reference.

Tyler M Hauer ^{1 2} , Lawrence J Wengle ^{1 2} , Daniel B Whelan ^{1 2}

Arthrosc Tech 2022 Aug 6;11(9):e1541-e1546. doi: 10.1016/j.eats.2022.04.004. eCollection 2022 Sep.

Adjuvant Medial Collateral Ligament Release at the Time of Knee Arthroscopy: A Controlled Percutaneous Technique

Orthop Traumatol Surg Res

2018 Sep;104(5):707-711. doi: 10.1016/j.otsr.2018.05.007. Epub 2018 Jun 19.

Does medial collateral ligament pie-crusting induce residual laxity in arthroscopic management of medial meniscus tears? A prospective study of 40 cases

Adrien Lons ¹ , Florian Boureau ² , Elodie Drumez ³ , Gilles Pasquier ² , Sophie Putman ²

EFORT Open Rev

2021 Aug 10;6(8):669-675. doi: 10.1302/2058-5241.6.200128. eCollection 2021 Aug.

Medial collateral ligament release during knee arthroscopy: key concepts

Vicente Carlos da Silva Campos ¹ , Francisco Guerra Pinto ² , Diogo Constantino ¹ , Renato Andrade ^{3 4} , João Espregueira-Mendes ^{3 5 6 7}

Knee Surg Sports Traumatol Arthrosc

. 2013 Jul;21(7):1540-5. doi: 10.1007/s00167-012-2128-x. Epub 2012 Jul 6.

Percutaneous medial collateral ligament release in arthroscopic medial meniscectomy in tight knees

Onur Fakioglu ¹ , Mehmet Hakan Ozsoy, Hacı Mustafa Ozdemir, Hasan Yigit, Ali Turgay Cavusoglu, Philipp Lobenhoffer

Arthrosc Sports Med Rehabil

. 2020 Jan 19;2(2):e153-e159. doi: 10.1016/j.asmr.2019.10.009. eCollection 2020 Apr.

Percutaneous Superficial Medial Collateral Ligament Release Outcomes During Medial Meniscal Arthroscopy: A Systematic Review

Michael A Gaudiani ¹ , Derrick M Knapik ² , Matthew W Kaufman ¹ , Michael J Salata ² , James E Voos ² , Michael R Karns ²

Australian orthopaedic surgeons' knowledge and practice of medial collateral ligament release in knee arthroscopy.

Andersen K, Mitchell D, Spencer L.

This article reports Saphenous nerve Injury and MCL over-release as real complications

Eur Rev Med Pharmacol Sci

. 2022 Mar;26(6):1860-1867. doi: 10.26355/eurrev_202203_28331.

Medial collateral ligament partial release in knee arthroscopy: different techniques and functional outcomes

D M Alharbi 1

Reply: Suggested references have been added.