

Repair of horizontal cleavage tears by posterior modified outside-in suture technique using spinal needle and suture hook

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Horizontal cleavage tears(HCTs) divide the meniscus into superior and inferior leaf. On MRI, this type of tear is demonstrated as a horizontal hyperintense line extending from the avascular center to the vascular periphery of the of the meniscus on sagittal and coronal planes. While HCTs are most common in individual older than 40 years old without history of big trauma, nonoperative treatment have been more emphasized than arthroscopic surgery if the patients have minimal symptom with small HCT. In patients with symptomatic extensive HCT, arthroscopic partial meniscectomy, such as superior or inferior leaf resection, have been traditionally preferred to meniscal repair for the weak meniscus leaf in HCT, due to poor high failure rate of meniscal repair for HCT. Reasons of preference for arthroscopic partial meniscectomy to repair include difficulty when performing a repair due to tear orientation and intrameniscal tear location, potential suture failure due to differential shear forces between the superior and inferior leaves, as well as poor healing rate due to involvement of avascular central zone and poor meniscal tissue quality. However, recent biomechanical studies regarding HCT have shown the deleterious effects of even single leaf partial meniscectomy and importance of repair to restore near-normal biomechanical joint environment and meniscal function. As a result, given the biomechanical benefits of meniscal repair and the ongoing advancement of repair technique, there has been growing trend to shift from partial meniscectomy to meniscal repair for HCT treatment, whenever possible. Nevertheless, there has been a relative lack of studies which report the healing rate of HCT repair. A few recent studies that addressing HCT repair outcomes were only reporting the results of HCT repair using company based devices such as all-inside anchor fixator or all-inside suture passer. In addition, previous studies on HCT repair did not show the change of repaired meniscus using serial magnetic resonance imaging (MRI).

Therefore, the purposes of this study was to investigate the healing rate and postoperative change of repaired HCT on serial MRI by posterior modified outside-in suture technique using spinal needle. It was hypothesized that the HCT meniscus which repaired by posterior modified outside-in suture technique using spinal needle could be healed successfully and the shape of repaired HCT meniscus would continuously change with time from before surgery to immediate postoperative and postoperative one year