Outcomes of pullout repairs for partial medial meniscus posterior root tears – comparison with complete radial tears

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Introduction: Good clinical outcomes after complete medial meniscus posterior root tear (MMPRT) repair have been reported recently, however, the progression of medial meniscus extrusion (MME) occurs during the follow-up after pullout repair, especially in older patients with degenerative menisci. The MMPRT can be roughly divided into two stages: partial tear and complete tear. Previously conservative treatment was mainly performed in partial MMPRTs. Recent studies have shown tibiofemoral joint stress increases even in partial MMPRTs [1], some partial MMPRTs progress to complete tear, and MME progresses in some partial MMPRTs with large MME [2]. We thus assume MMPRT repair for partial MMPRTs could be effective in some cases, and the outcomes of pullout repair of partial MMPRTs are superior to those of complete radial MMPRTs. This study aimed to reveal clinical, arthroscopic, and radiologic outcomes of partial MMPRTs following transtibial pullout repair and compare these outcomes with those of complete radial MMPRTs.

Methods: Partial MMPRTs were diagnosed based on the characteristic ocaria sign [3], and the absence of complete tear signs on MRI. From 2019 to 2021, 101 patients who underwent transtibial pullout repair for MMPRT were enrolled in the study. The patients were divided into two groups: partial radial tear group (15 knees, male/female, 5/10, average age, 64.4 years) and complete radial tear group (80 knees, male/female, 18/68, average age, 66.4 years). All patients underwent second-look arthroscopy on average one year post-operatively, and a semi-quantitative meniscal healing score composed of three criteria (anteroposterior width, stability, and synovial coverage, total 10 points) was evaluated (Fig. 1). Medial meniscus extrusion using magnetic resonance imaging and clinical scores, including the International Kne

References:

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Figures/tables:

Fig. 1: Arthroscopic findings at primary surgery and second-look arthroscopy. (a) Partial tear with connecting tissue coverage (arrowhead). (b, c) Healed meniscus with good stability. (d) Complete tear (e, f) Healed meniscus with loose stability.

Fig. 2: Pre- and postoperative clinical outcomes in the partial tear group. The white and blue bars denote the pre-operative and post-operative scores, respectively. ** P < 0.05.

Table. 1: Comparison of arthroscopic scores, MRI findings, and postoperative clinical scores between groups. Values are presented as mean ± standard deviation. 1 year, 1Y. International Knee Documentation Committee Score, were evaluated pre-operatively and at second-look arthroscopy.

<table>
<thead>
<tr>
<th>Partial tear</th>
<th>Complete tear</th>
<th>P value</th>
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<tbody>
<tr>
<td>Arthroscopic scores</td>
<td></td>
<td></td>
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<tr>
<td>Meniscal healing score (point)</td>
<td>8.3 ± 1.2</td>
<td>7.1 ± 1.1</td>
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<tr>
<td>Width of bridging tissues (point)</td>
<td>4.0 ± 0.0</td>
<td>3.9 ± 0.4</td>
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<tr>
<td>Stability (point)</td>
<td>3.2 ± 0.9</td>
<td>2.3 ± 0.6</td>
</tr>
<tr>
<td>Synovial coverage (point)</td>
<td>1.0 ± 0.7</td>
<td>0.9 ± 0.5</td>
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MRA findings

Pre-operative MME (mm) | 3.0 ± 0.7 | 3.2 ± 0.9 | 0.60 |
1Y Postoperative MME (mm) | 3.4 ± 1.0 | 4.2 ± 1.3 | 0.01* |
AMME postoperative to 1Y (mm) | 0.4 ± 0.6 | 1.0 ± 1.0 | 0.02* |

Postoperative clinical scores

Lysholm knee score | 88.4 ± 5.7 | 87.1 ± 6.3 | 0.63 |
IKDC score | 67.9 ± 11.0 | 64.0 ± 15.2 | 0.61 |
VAS pain score (0 ~ 100) | 8.6 ± 7.1 | 11.1 ± 15.1 | 0.43 |

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