Superior patient satisfaction, resulting from a surgical procedure which is spared Pronator Quadratus detaching: A prospective randomized controlled trial

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Hypothesis
Surgical procedure “without” pronator quadratus (PQ) detaching is superior to “with” PQ detaching, when comparing post-operative clinical outcomes after open reduction and internal plate fixation for distal radius fractures.

Materials & Methods
- Comparing the surgical procedures and post-operative clinical outcomes of 30 patients with extension type fracture of the distal radius.
- The cases were randomly separated into two groups.
- One group received surgery “with” PQ detaching (14 patients).
- The second group received surgery “without” PQ detaching (16 patients).
- Post-operative outcomes were assessed at approximately 6 months after surgery using The DASH Outcome Measure, modified Mayo wrist score, range of motion of the wrist and grip strength.
- Radiographic assessments were performed immediately after each operations and at final follow up appointment of the patients.

Results

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Patient Demographics</th>
<th>Photographs of one case without PQ detaching in surgery (R. Hand)</th>
<th>Photographs of one case without PQ detaching in surgery (R. Hand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of enrolled fractures</td>
<td>Pronator Quadratus</td>
<td>Only distal edge of Pronator quadratus was dissected</td>
<td>After a plate was positioned under PQ. Only distal end of the plate can be seen.</td>
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<tr>
<td>Simple Colles fractures without comminution of volar cortex</td>
<td>Detaching</td>
<td></td>
<td></td>
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<tr>
<td>AVNDR: All &lt; 0, C1 &lt; 0</td>
<td>PQ detaching</td>
<td></td>
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<tr>
<td>Cases having displacement on joint surface were excluded</td>
<td>No</td>
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</table>

In the demonstrated cases of extension type fracture of the distal radius, the procedure “without” PQ detaching in open reduction and internal plate fixation presented significantly better subjective recovery results than the procedure “with” PQ detaching, when comparing patient-rated evaluation.

Conclusion

When operating the distal radius fractures through a volar approach, the PQ is generally once detached from the surface of the distal radius. In order to preserve physiological function of PQ, some authors recommend not to detach it in operation. In the anatomical and functional literatures, it is stated that PQ has two distinct heads and the superficial head is the prime mover in forearm pronation, and the deep head is a dynamic stabilizer of the distal radioulnar joint. This study was planned to confirm the influence of PQ detaching to post-operative outcomes in practical clinical scene. Intra-articular fractures having displacement of articular surface and fractures having comminution of volar cortex were excluded from the study because there was a risk of insufficient reduction when the PQ muscle was preserved in operation. Although the number of recruited case was small because of strict criterion for enrollment, there was significant difference in the patient-rated evaluation. Superior patient satisfaction, resulting from surgical procedure which is spared pronator quadratus detaching, could be observed. It was supposed that the damage to the PQ muscle caused by detaching procedure resulted in impairment of the physiological PQ function which contributed to pronation strength in forearm rotation and dynamic stabilization of the distal radioulnar joint.

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