Comparison of Clinical Results After Pisiformectomy in Patients With Rheumatic Versus Posttraumatic Osteoarthritis

MARTIN LAUTENBACH, MD; ANDREAS EISENSCHENK, MD; INGA LANGNER, MD; ULRIKE ARNTZ, MD; MICHAEL MILLROSE, MD

abstract

Pisotriquetral osteoarthritis is important to consider in the differential diagnosis of chronic ulnar-sided wrist pain. It can develop following traumatic injury to the pisiform or in rheumatic diseases, such as rheumatoid arthritis or psoriatic arthritis. It has been shown that pisiformectomy can relieve symptoms in cases that have not responded to nonoperative treatment, and the excision does not compromise the function or strength of the wrist. Most studies focus on posttraumatic causes of pisotriquetral osteoarthritis. In the current study, rheumatic causes are also considered and the outcomes are compared.

This retrospective study included 35 patients who underwent pisiformectomy for pisotriquetral osteoarthritis. All patients underwent a thorough diagnostic evaluation to exclude other etiologies for ulnar-sided wrist pain. Radiological examinations including posteroanterior and lateral views of the wrist and a tangential view of the pisotriquetral joint were analyzed. All patients had excellent or very good results after pisiformectomy, with a significant reduction in pain. No significant difference was found in the outcomes for patients with rheumatic vs posttraumatic osteoarthritis.

Patients with rheumatic causes of pisotriquetral osteoarthritis can be successfully treated with pisiformectomy. With respect to idiopathic causes, these patients need a longer postoperative period to gain full pain relief. It is important to consider the possibility of pisotriquetral osteoarthritis after excluding other diagnoses in patients with rheumatic osteoarthritis.

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The authors have no relevant financial relationships to disclose.

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Pisotriquetral osteoarthritis as the result of instability between the pisiform and the triquetrum is a rare cause of ulnar-sided wrist pain.\textsuperscript{1,2} It is important to include in the differential diagnosis of lesions of the triangular fibrocartilage complex, triquetral impingement, and enthesopathies of the extensor carpi ulnaris, which must be considered in chronic ulnar-sided wrist pain.\textsuperscript{3} It follows scaphotrapeziotrapezoid arthritis as the second most common form of degeneration of the carpus. It is often an element in polyarthritis of the hand.

Pisotriquetral osteoarthritis can develop following a traumatic injury to the pisiform or joint (Figure 1). It is also known that rheumatic diseases, such as rheumatoid arthritis or psoriatic arthritis, can cause degeneration of the pisotriquetral joint, leading to osteoarthritis (Figure 2).\textsuperscript{4,5} No radiological classification is available for pisotriquetral osteoarthritis.

Physiotherapy, nonsteroidal anti-inflammatory drugs (NSAIDs), and intra-articular steroid injections can be used to treat this relatively uncommon condition. It has been shown that pisiformectomy can relieve symptoms in cases that have not responded to the abovementioned nonoperative treatments.\textsuperscript{6-8} Excision does not compromise the function or strength of the wrist after regeneration.

Most studies focus on posttraumatic causes of pisotriquetral osteoarthritis. In the current study, rheumatic causes were considered, such as rheumatoid arthritis or psoriatic arthritis, and the outcomes were compared with the outcomes in posttraumatic causes. Guyon’s canal syndrome, an entrapment of the ulnar nerve at the wrist, is a relatively common occurrence in patients with pisotriquetral osteoarthritis and was also analyzed.

**MATERIALS AND METHODS**

For this retrospective study, 35 consecutive patients with pisotriquetral osteoarthritis who underwent a pisiformectomy performed by the senior author (M.L.) between January 2002 and August 2010 were considered. Only patients with a primary or secondary posttraumatic etiology of pisotriquetral osteoarthritis or rheumatic disease, such as rheumatoid arthritis or psoriatic arthritis, were included.

Among the 35 patients, 30 had primary or secondary posttraumatic osteoarthritis of the pisotriquetral joint and 5 had an underlying rheumatic disease. Besides their pisotriquetral osteoarthritis, 5 patients with posttraumatic osteoarthritis and 1 patient with rheumatic osteoarthritis also had Guyon’s canal syndrome, which was confirmed preoperatively by a neurologist.

The study group comprised 30 women and 5 men with a mean age of 48.4 years (range, 21-78 years) at the time of excision. The right hand was involved in 17

![Figure 1: Tangential radiograph of pisotriquetral osteoarthritis.](image)

![Figure 2: Sagittal magnetic resonance images of acute rheumatoid osteoarthritis of the pisotriquetral joint.](image)
patients and the left in 14. Two patients were affected in both hands and treated with consecutive surgical procedures.

All patients underwent thorough diagnostically evaluation to exclude etiologies other than pisotriquetral osteoarthritis for the ulnar-sided wrist pain. All had previously been treated with physiotherapy, NSAIDs, and intra-articular steroid and local anesthetic injections. The injections confirmed the pisotriquetral joint as the source of the pain. All methods had no more sufficient pain reduction at the time of operation.

Radiological examinations, including posteroanterior and lateral views of the wrist and a tangential view of the pisotriquetral joint, were performed. All patients had radiological alterations of the pisotriquetral joint. Because no specific classification of pisotriquetral osteoarthritis exists, the findings have been descriptively categorized (Table 1). A decentring of the pisiform is defined as a decentring of the centers of the convexity of the pisiform respective to the concavity of the hamate. Therefore, a tangential view of the pisotriquetral joint is necessary.

Preoperatively, all patients reported severe pain in the affected wrist and a functional deficit. Those findings were documented using the visual analog scale (VAS) score and the Disabilities of the Arm, Shoulder and Hand (DASH) score. Clinical examination included obtaining a thorough history and recording the joint’s movements using a goniometer and the patient’s grip strength using a dynamometer.

The pisiformectomy was performed as described by Belliappa and Burke.9 Briefly, the pisiform is excised from the flexor carpi ulnaris tendon and the pisohamate and pisometacarpal ligaments. After the excision, the dissected tendon is repaired and the wrist is placed on a protective palmar slab for 2 weeks. All patients were examined for at least 6 months postoperatively. No patient underwent additional surgery on the operated hand.

RESULTS

Posttraumatic Osteoarthritis Without and With Guyon’s Canal Syndrome

At postoperative follow-up, all 25 patients with primary or secondary posttraumatic osteoarthritis without Guyon’s canal syndrome rated their subjective improvement as very good. No poor results were reported. Mean postoperative DASH score was 25.3 (range, 12-38).

Patients reported a significant reduction in pain. Mean VAS score reduced from 7.8 (range, 6-9) preoperatively to 1.3 (range, 0-3) postoperatively (P<.01). Almost complete pain relief was achieved after a mean postoperative period of 7.4 weeks, but 6 patients needed as long as 12 weeks (range, 0-12) (Table 2). Compared with the unaffected wrist, no objective losses were observed in mean grip strength or wrist range of motion were observed.

The 5 patients with primary or secondary posttraumatic osteoarthritis with Guyon’s canal syndrome rated their postoperative improvement as excellent, with complete relief of their neurological symptoms. Mean postoperative DASH score was 28.8 (range, 21-38).

Patients reported a significant reduction in pain. Mean VAS score reduced from 8 (range, 5-10) preoperatively to 1.2 (range, 0-3) postoperatively (P<.01). Almost complete pain relief was achieved after a mean postoperative period of 12 weeks (range, 8-24 weeks) (Table 2). Compared with the unaffected wrist, no objective losses were observed in wrist range of motion or mean grip strength.

The only statistically significant difference between the between the posttraumatic vs rheumatic osteoarthritis groups was the duration of the postoperative period until pain relief (P<.05).

DISCUSSION

The pisiform is a sesamoid in the palmar part of the ulnar side of the wrist. It is completely embedded into the flexor carpi ulnaris tendon and articulates with the triquetrum as the pisotriquetral joint. It is stabilized by what is referred to as the pisotriquetral osteoarthritis complex, which is formed by the pisohamate ligament, the pisometacarpal ligament, and other extrinsic ligaments. This complex ensures correct alignment of the joint.

Acute or repetitive trauma can damage the pisiform ligament complex, which can lead to instabilities in the pisotriquetral joint.

Patients reported a significant reduction in pain. Mean VAS score reduced from 8 (range, 5-10) preoperatively to 1.2 (range, 0-3) postoperatively (P<.01). Almost complete pain relief was achieved after a mean postoperative period of 12 weeks (range, 8-24 weeks) (Table 2). Compared with the unaffected wrist, no objective losses were observed in wrist range of motion or mean grip strength.

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<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Radiographic Analysis (n=35)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Radiograph Description</th>
<th>Occurrence, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteophytes</td>
<td>57.1</td>
</tr>
<tr>
<td>Narrowing of joint space (without sclerosis)</td>
<td>14.3</td>
</tr>
<tr>
<td>Decentering of pisiform</td>
<td>25.7</td>
</tr>
<tr>
<td>Narrowing of joint space (with sclerosis)</td>
<td>65.7</td>
</tr>
<tr>
<td>Sclerosis</td>
<td>2.9</td>
</tr>
<tr>
<td>Calcification of flexor carpi ulnaris</td>
<td>14.3</td>
</tr>
</tbody>
</table>

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Acute or repetitive trauma can damage the pisiform ligament complex, which can lead to instabilities in the pisotriquetral joint.
Table 2
Results After Pisiformectomy in Different Pisotriquetral Osteoarthritis

<table>
<thead>
<tr>
<th>Postoperative Period</th>
<th>Not Affected</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean VAS (Range)</td>
<td>Preop</td>
<td>Postop</td>
</tr>
<tr>
<td>OA w/o Guyon’s canal syndrome (n=25)</td>
<td>7.8 (6-9)</td>
<td>6.5 (0-7)</td>
</tr>
<tr>
<td>OA w/ Guyon’s canal syndrome (n=5)</td>
<td>8.7 (9-10)</td>
<td>6.5 (0-7)</td>
</tr>
<tr>
<td>OA due to rheumatoid disease (n=5)</td>
<td>8.5 (10-10)</td>
<td>6.5 (0-7)</td>
</tr>
</tbody>
</table>

Mean ROM, deg

<table>
<thead>
<tr>
<th>Postoperative Period</th>
<th>Not Affected</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ROM (Range)</td>
<td>Preop</td>
<td>Postop</td>
</tr>
<tr>
<td>OA w/o Guyon’s canal syndrome (n=25)</td>
<td>13 (0-3°)</td>
<td>6 (0-3°)</td>
</tr>
<tr>
<td>OA w/ Guyon’s canal syndrome (n=5)</td>
<td>12 (1°-2°)</td>
<td>6 (0-3°)</td>
</tr>
<tr>
<td>OA due to rheumatoid disease (n=5)</td>
<td>12 (0-3°)</td>
<td>6 (0-3°)</td>
</tr>
</tbody>
</table>

Mean Grip Strength, kg

<table>
<thead>
<tr>
<th>Postoperative Period</th>
<th>Not Affected</th>
<th>Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Grip Strength (Range)</td>
<td>Preop</td>
<td>Postop</td>
</tr>
<tr>
<td>OA w/o Guyon’s canal syndrome (n=25)</td>
<td>22.14</td>
<td>22.83</td>
</tr>
<tr>
<td>OA w/ Guyon’s canal syndrome (n=5)</td>
<td>22.15</td>
<td>22.83</td>
</tr>
<tr>
<td>OA due to rheumatoid disease (n=5)</td>
<td>22.14</td>
<td>22.83</td>
</tr>
</tbody>
</table>

It is known that patients with rheumatic diseases, such as rheumatoid arthritis or psoriatic arthritis, develop secondary degeneration in other joints, such as the wrist or the knee, due to a chronic autoimmune inflammatory response. This leads to dysfunction of the joint and, ultimately, to osteoarthritis caused by rheumatism.12

Most studies of pisotriquetral osteoarthritis have only focused on primary and secondary osteoarthritis due to trauma. In the current study, the authors also included patients with a rheumatic etiology. In a review of all published articles about pisotriquetral osteoarthritis, Paley et al6 reported that only 5% of cases are caused by rheumatic diseases, such as rheumatoid arthritis or psoriatic arthritis, whereas more than 90% are posttraumatic or caused by a flexor carpi ulnaris enthesopathy. The large number of rheumatic causes in the current study is mainly accounted for by the fact that the authors’ hospital specializes in the diagnosis and treatment of patients with rheumatism.

To the authors’ knowledge, this retrospective study has the highest numbers of patients with different etiologies compared with all other published studies on the subject. The authors were able to demonstrate comparable outcomes with those reported in the literature with respect to subjective improvement, grip strength, and wrist range of motion in patients with primary and secondary osteoarthritis of the pisotriquetral joint.

The authors were also able to show that outcomes for patients with rheumatoid arthritis or psoriatic arthritis were excellent but they needed a longer postoperative period to obtain pain relief than those with idiopathic causes. In rheumatic patients with ulnar-sided wrist pain, it is important to consider the possibility of pisotriquetral osteoarthritis after excluding other diagnoses. These patients can be successfully treated with pisiformectomy.

The results of this study with regard to the rheumatic causes of pisotriquetral osteoarthritis and its long-term effects on the stability of the rheumatic wrist should be investigated in a larger cohort in a multicenter study.
REFERENCES


