

# Arthroscopic Synovectomy of Wrist in Rheumatoid Arthritis



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## KEYWORDS

• Rheumatoid arthritis • Rheumatoid wrist • Arthroscopy • Synovectomy

## KEY POINTS

- Arthroscopic synovectomy of the rheumatoid wrist can reduce pain and improve function.
- Arthroscopic synovectomy is a safe and minimally invasive procedure.
- Long-term control rate of synovitis after arthroscopic synovectomy is approximately 75%.

## INTRODUCTION

Rheumatoid arthritis (RA) is a systemic inflammatory disorder affecting multiple joints. The etiology is unclear. It is probably related to a T-lymphocyte-mediated immune response to autoantigens mediated by activation at the HLA-II locus.<sup>1</sup> Growth factors and cytokines, such as tumor necrosis factor and interleukin-1, play important roles during the initiation and progression of RA.<sup>2</sup> RA has an incidence of 0.5% to 1.0% of the population.<sup>3</sup> RA occurs 3 times more frequently in women than in men.<sup>4</sup> It has a peak onset of 40 to 60 years old.<sup>4</sup> Wrist involvement in RA is common, affecting up to 50% of patients within the first 2 years after the onset of the disease, and more than 90% of patients after 10 years.<sup>5</sup> Initial treatment for RA is medical treatment, including disease-modifying antirheumatic drugs and biologic agents.<sup>6</sup> In cases of failed medical treatment, surgical procedures may be necessary to relieve pain and preserve joint function. Surgical treatment options include joint-preserving techniques, such as synovectomy, and joint-salvage techniques, such as arthrodesis.<sup>7</sup> Synovectomy is

usually considered unless the articular cartilage is severely damaged. Arthroscopic synovectomy was introduced in the 1990s with results similar to those of conventional open surgical synovectomy.<sup>8–10</sup> Arthroscopic synovectomy has several advantages, including minimal postoperative pain with small incision and early rehabilitation.

## DIAGNOSIS AND CLASSIFICATION

Synovitis is the major clinical feature of RA. Rheumatoid wrist begins with reversible pain, swelling, and tenderness of the dorsal wrist for weeks to months. Range of motion, grip strength, and function may be affected. Deformity occurs in advanced stages. Ligaments become attenuated, triangular fibrocartilage complex is progressively destroyed, and tenosynovitis occurs. Typical deformity includes scapholunate dissociation, carpal supination, translocation of the carpus in an ulnar and volar direction, radial deviation of the carpus, and dorsal subluxation of the ulna. These deformities cause carpal collapse, ultimately leading to pan-carpal arthritis.<sup>11</sup>

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Abnormal findings are rarely seen at the initial stage on simple radiographic examination. When the disease progresses, radiologic changes will occur, including narrowing of the joint space, multiple subchondral bone cysts, and periarticular osteoporosis. There are various scoring systems for RA, such as the Larsen classification (Table 1).<sup>12</sup> The Wrightington classification has been introduced as a radiographic means to evaluate RA of the wrist (Table 2).<sup>13</sup> The Simmen classification represents a prognostic typing for RA wrists (Table 3).<sup>14</sup>

## TREATMENT

The goal of treatment for RA is to alleviate pain and preserve joint function by preventing articular cartilage damage. Treatment is based on anti-rheumatic drugs, including disease-modifying antirheumatic drugs and biological agents. The development of medical treatments, especially biological agents, has reduced the necessity for surgical treatment.<sup>15</sup> However, surgical treatment is sometimes required because not all patients can achieve treatment goals with medical treatments alone. Surgical treatments for rheumatoid wrist generally include synovectomy, tenosynovectomy, tendon repair/reconstruction, treatment for arthritic distal radioulnar joint, partial and complete arthrodesis of the radiocarpal joint, and wrist arthroplasty.<sup>7,16-18</sup>

## SYNOVECTOMY

Synovectomy means surgical resection of the hypertrophied synovium of the joint.<sup>7,18</sup> Synovectomy in the rheumatoid wrist has been reported to be an effective procedure for relieving pain and preventing further destruction of the tendons

**Table 1**  
Definition of Larsen's grading system

Score	Definition
0	Normal
1	Soft tissue swelling and/or joint space narrowing/subchondral osteoporosis
2	Erosion with destruction of the joint space (DJS) of <25%
3	DJS: 26% ~ 50%
4	DJS: 51% ~ 75%
5	DJS >75%

From Rau R, Herborn G. A modified version of Larsen's scoring method to assess radiologic changes in rheumatoid arthritis. *J Rheumatol* 1995;22(10):1977; with permission.

**Table 2**  
The Wrightington classification for rheumatoid arthritis of the wrist

Grade	Definition
Grade I	Wrist architecture preserved, mild rotatory instability of the scaphoid, periarticular osteoporosis, early cyst formation
Grade II	Ulnar translocation, lunate volar flexed, flexed scaphoid, radiolunate destruction (radioscaphoid and midcarpal preserved)
Grade III	Intercarpal joints arthritic, radioscaphoid eroded, volar subluxation of carpus (gross bony architecture preserved)
Grade IV	Loss of large amount of bone stock from distal radius, gross erosion of ulnar side of radius

From Hodgson SP, Stanley JK, Muirhead A. The Wrightington classification of rheumatoid wrist X-rays: a guide to surgical management. *J Hand Surg Br* 1989;14(4):452; with permission.

and joint by several investigators.<sup>19-26</sup> Open synovectomy is usually performed with tenosynovectomy, tendon repair or transfer, and distal ulnar surgery.<sup>20,22,23,25</sup> Synovectomy also can reduce sensory innervation of synovial tissues, thus reducing pain with improved mobility.<sup>27</sup> However, open synovectomy might be associated with decreased range of motion (ROM) and increased

**Table 3**  
The Simmen classification for rheumatoid arthritis of the wrist

Type	Definition
Type I (ankylosis)	Spontaneous tendency to fuse, stable pattern
Type II (arthrosis)	Articular loss progresses at equilibrium with arthrosis, stable
Type III (disintegration)	Progressive destruction, loss of alignment, unstable

From Simmen BR, Huber H. The wrist joint in chronic polyarthritis—a new classification based on the type of destruction in relation to the natural course and the consequences for surgical therapy. *Handchir Mikrochir Plast Chir* 1994;26(4):183; with permission. [in German].

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