

Distal Radioulnar Joint Arthroplasty with a Scheker Prosthesis

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We report a case of distal radioulnar joint (DRUJ) arthroplasty with a Scheker prosthesis. Arthropathy of the DRUJ can occur as the result of a variety of mechanisms, including inflammatory arthritis, osteoarthritis, and post-traumatic arthritis. Resection of the distal ulna is often performed to relieve pain at the DRUJ. However, this can also disrupt the stability of the entire forearm, leading to convergence instability of the stump of the ulna against the radius. Several DRUJ prostheses have been developed to replace the mechanical function of the ulnar head in patients with pain related to distal ulnar resection and post-traumatic arthritis. However, most of them are designed to be used in patients with intact soft tissue and stabilizing ligaments at the DRUJ. These devices, therefore, are not appropriate for use in patients who have undergone resection of the DRUJ. The Scheker prosthesis was designed for patients who are symptomatic after ablation of the DRUJ from trauma or prior surgical resection. It uses a two plate and ball design, which has a unique appearance on post-operative radiographs.

Case Report

We report the case of a 28 year old man who sustained a rotary injury to his wrist. Eight months later at an outside institution, he underwent an ulnar shortening osteotomy. One year later, due to continuing symptoms, a second surgery was performed, with hardware removal and distal right ulna resection. He presented to our institution 16 months later with constant, worsening pain in his right upper extremity which increased with activity, despite treatment. Physical examination showed limited range-of-motion of flexion and extension in the right wrist, decreased range of supination at the elbow, decreased right grip strength, and instability of the distal ulnar stump.

Initial radiographs demonstrated distal ulnar resection (Figure 1). The patient next underwent placement of a Scheker prosthesis ([Aptis Medical](#)) at the DRUJ. A post-operative image is shown in Figure 2.

Discussion

The DRUJ allows supination and pronation of the forearm and is important to one's grip strength and lifting ability. Arthropathy of the DRUJ can occur as the result of a variety of mechanisms, including inflammatory arthritis (particularly rheumatoid arthritis), post-traumatic causes and congenital or developmental abnormalities of the joint surfaces (1). A common post-traumatic cause is a malunited Colles fracture of the distal radius. DRUJ arthropathy presents with pain near the DRUJ, particularly with gripping and resisted rotation of the forearm. The diagnosis can be made on the basis of standard AP and lateral radiographs.

After degenerative findings have developed in the DRUJ articular surfaces, surgical options are largely limited to salvage procedures (1). Therefore, conservative management with splints, anti-inflammatory medications, activity modification and steroid injections is preferred. Once conservative methods fail, resection of the distal ulna can be considered to relieve pain at the DRUJ. Distal ulnar resection, however, disrupts the stability of the entire forearm, leading to a reduction in stability and torque strength, as

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Abbreviations: DRUJ, distal radioulnar joint, AP, anteroposterior, UHMWP, ultra high molecular weight polymer

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Figure 1: Pre-operative anteroposterior (AP) radiograph of the right wrist shows distal ulnar resection.



Figure 2: Post-operative AP and oblique radiographs of the right wrist showing the Scheker prosthesis.

well as decreased upper limb function. Pain is caused by convergence instability of the stump of the ulna against the radius (1, 2). In this case, one option is to create a one bone forearm, although this eliminates one's ability to supinate and pronate the forearm, and is extremely limiting (2). DRUJ prostheses have been developed to replace the mechanical function of the ulnar head in patients with pain related to distal ulnar resection (1, 3) and post-traumatic arthritis (2).

The Scheker prosthesis (Aptis Medical, Louisville, KY) was approved for marketing in the United States by the U.S. Food and Drug Administration in January, 2005. It was designed for patients who remain symptomatic after ablation of the DRUJ from trauma or prior surgical resection (2). The prosthesis consists of a cobalt chromium plate that is attached to the distal radius by a peg and 5 cortical screws. The distal plate contains a hemi-socket. A fluted cobalt chromium stem is inserted into the ulna. This stem has a polished peg distally that fits inside a ultra high molecular weight polymer (UHMWP) ball, which in turn fits into the socket connected to the radial plate. A socket cover is placed over the ball to secure the housing. The peg moves freely within the ball, and the ball moves freely within the socket, allowing full supination and pronation (2). The device and its components can be seen on the [manufacturer's website](#).

Scheker et al reported their experience with 23 patients with this prosthesis (2). All patients had previously had at least one salvage procedure involving partial or total excision of the ulnar head and were symptomatic, with pain and ulnar instability. All 23 patients had complete relief of pain following placement of the Scheker prosthesis, with normal pronation, supination and the ability to lift weight.

Several prostheses have been designed for replacement of the distal radial ulna joint. However, most of them are designed to be used in patients with intact soft tissue and stabilizing ligaments at the DRUJ. These devices, therefore, are not appropriate for use in patients who have undergone resection of the DRUJ. The Scheker prosthesis was specifically designed for this patient population, and provides its own intrinsic stability.

In conclusion, we report the radiographic appearance of the Scheker device, a new type of prosthesis used to restore function of the distal radioulnar joint in patients who fail more conservative treatment.

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