

# Results and clinical application of the KPS bipolar radial head prosthesis

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## 1. Introduction

Fractures of the radial head constitute about 30% of all fractures around the elbow joint [1, 2]. Five to ten percent of all elbow dislocations are associated with peri-articular fractures, most commonly the radial head [3, 4, 5] In comminuted fractures of the radial head anatomic reduction and stable fixation are not always possible. In such cases the treatment is controversial – resection versus replacement. The complications after radial head resection are well known [6], and prosthetic replacement is clearly indicated after radial head resection in the presence of a medial collateral ligament or interosseous membrane injury [2]. With the increasing recognition of “complex instability” the value of the radial head in providing elbow stability is emerging [7].

Unfortunately, no silastic or metal monoblock radial head prostheses that are currently available have proven entirely satisfactory. The most common complications include loosening [8, 9, 10] and damage to the implant/fatigue fracture [8, 10, 11, 12, 13]. Additionally, implantation of a silastic prosthesis is associated with osteoporosis of the capitellum and silicone synovitis [8, 12, 14, 15, 16, 17]. Cadaveric studies have also shown that the silastic implant is unable to adequately resist valgus stress applied to the elbow joint [9, 14, 18, 19]. Recently, bipolar radial head prostheses have been introduced, and these are commercially available in a few countries and used by some medical centers in Europe [20, 21, 22, 23, 24]. Judet et al have reported very promising clinical results, believing that the bipolar design overcomes many of the existing complications [21]. Pomianowski et al and Skalski et al introduced a bipolar radial head prosthesis with a short (2 cm), straight stem and an arc of 30 degrees of angular movement [22, 24].

The additional freedom of movement of a bipolar prosthesis should theoretically reduce the stress on the implant and the implant-bone interface, thereby decreasing the risk of loosening of the implant. The free motion of the radial head might also decrease wear on the capitellum.

As the head of a bipolar implant is mobile, the extent to which such a prosthesis can contribute to stability of the elbow was not clear. It has been already proved that a bipolar implant can be as effective as a monoblock radial head prosthesis in restoring valgus stability of the elbow after injury to the medial collateral ligament [25].

## 2. Material and Methods

From 1998 to 2009 we implanted KPS radial head prosthesis into 133 elbows for multifragmental Mason type III fractures of the radial head, either isolated or associated with other injuries. So far we evaluated 110 elbows. The mean follow-up in years was 4,5 (from 3 months to 11 years). There were 52 male and 58 female. 77 right and 33 left hand were involved. The patients age in years was from 18 to 81, average 49. We used the antero-lateral approach in all operated cases. After the surgery elbows were not immobilised, we introduced passive and active range of motion from the second day after the operation.

## 3. Results and Discussion

The clinical results were evaluated according to the Mayo Elbow Performance Score.<sup>26</sup> We reported 68 excellent, 28 good, 8 fair and 6 bad results. In the group of bad results 2 patients developed implant loosening and the prostheses were removed. 4 other patients developed early (2) and late (2) deep infections and implants were also removed.

Our results are similar to the results reported by other authors [27, 28, 29].

## 4. Conclusion

Excellent and good results in 96/110 patients (87%) after KPS bipolar radial head replacement encourage us to use this implant in clinical practice as an alternative operation to radial head resection.

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