

**Identifying Barriers to the Care of the Rheumatoid Hand in China: Comparing Attitudes
of Rheumatologists and Hand Surgeons**

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ABSTRACT

Aim: In China, hand surgeons treat fewer rheumatoid arthritis (RA) patients compared to other countries. We investigated whether physician and surgeon knowledge, attitudes, and practices regarding RA hand deformities reflect current evidence and may contribute to the low utilization of surgery.

Method: We surveyed hand surgeons and rheumatologists at three tertiary hospitals in Beijing, China. Questionnaires were developed from literature and expert review to assess their knowledge, attitudes, and practice patterns related to rheumatoid hand surgery.

Results: Thirty-five hand surgeons and 59 rheumatologists completed the survey. Roughly one-third felt that the rheumatologists and hand surgeons agree on how to manage RA hand deformities. One fifth of rheumatologists and 29% of hand surgeons believed that drug therapy can correct hand deformities, which contradicts current evidence. Likewise, 30% and 14%, respectively, recommended surgery for early stage hand sequelae that do not meet current indications for surgery. Over 80% of surgeons and rheumatologists had no exposure to the other specialty during training and felt their training on the treatment of rheumatoid hand deformities was adequate.

Conclusion: Although we found similar interspecialty disagreement in China as is seen in the United States, there appears to be less interaction through training and consultations. Our results also indicate potential deficits in training and unawareness of evidence and indications for rheumatoid hand surgery. These findings help to explain why surgery for rheumatoid hand deformities is rare in China; doctors have less opportunity to collaborate across specialties and may not be able to select appropriate candidates for surgery.

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KEY WORDS

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1. Rheumatoid arthritis

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2. Hand surgery

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3. Rheumatology

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4. Survey

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5. China

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INTRODUCTION

Rheumatoid arthritis (RA) is an autoimmune disease that causes progressive joint deterioration and affects the hands in over 70% of patients, leading to functional impairment, pain, and joint deformities.(1) In the United States, Western Europe, and Japan, hand surgery procedures, such as arthroplasty, arthrodesis, and tenosynovectomy, are used to treat advanced RA hand deformities with good outcomes.(2-5) In China, however, where estimates of the prevalence of RA range from 0.28% to 0.45%,(6-8) these reconstructive procedures are rarely performed.(5) This anomalous management of RA hand deformities has not been explained, but may be related to disagreement among specialists and practice patterns that are not fully engaged in current evidence-based medicine.

Metacarpophalangeal (MCP) joint arthroplasty is a common hand surgery procedure among RA patients.(3, 9, 10) Long-term prospective outcomes investigations support its ability to reduce hand pain, increase hand function, correct ulnar drift, and achieve favorable aesthetic results in patients with advanced joint disease.(4, 11, 12) Yet prior studies in the United States demonstrate marked disagreement between rheumatologists and hand surgeons and variability in practice patterns that can affect referral for surgery.(13) Although these same challenges may face Chinese doctors, it is likely that other factors, such as insufficient knowledge and training, prohibit greater use of RA hand surgery in China. Among Chinese physicians who treat cancer patients, for example, misconceptions and lack of knowledge prevent the proper use of morphine for cancer pain management, which hampers patients' quality of life.(14) RA joint deformities are a multidisciplinary problem best managed by a team of rheumatologists and surgeons.(10, 15, 16) All doctors involved must be well versed in the available treatment options and indications to practice evidence-based medicine and to counsel patients appropriately.

We undertook a pilot study of hand surgeons and rheumatologists at three tertiary academic health centers in Beijing to explore how each specialty approaches RA hand deformities. Specifically we sought to understand the cause for the low rate of RA hand surgery in China by investigating the following: rheumatologist and hand surgeon training and practices; knowledge of rheumatoid hand deformities; perceptions of the other

68 specialty; and response to two clinical scenarios to gauge the knowledge of surgical
69 indications. Using these data, we compare Chinese rheumatologists and hand surgeons to
70 assess whether interspecialty disagreement is present and whether self-reported knowledge
71 and practice patterns reflect current evidence. We hypothesize that the lack of
72 interdisciplinary understanding of the care of the RA hand contributes to the low rate of RA
73 hand surgery in China.

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75

METHODS

76 Our Institutional Review Board approved this methodology.

Sample

78 We obtained convenience samples of rheumatologists and hand surgeons from three
79 large teaching hospitals in Beijing during the summer of 2015. All three sites are prominent
80 institutions in Beijing and nationally with expertise in internal medicine, scientific research,
81 and hand surgery. Rheumatologists and hand surgeons were eligible if they were actively
82 practicing in China and had completed medical school (i.e. Bachelor's, Master's, or
83 Doctoral degrees in medicine) and residency training either in internal medicine or in
84 general, orthopedic, or plastic surgery. Completion of fellowship training was not a
85 requirement. In addition to staff doctors at these three hospitals, we also invited visiting
86 professors and attendees from one morning session of a national rheumatology conference
87 at one of the sites to participate.

88

Questionnaires

90 We developed questionnaires in English based on review of the relevant literature as
91 well as input from clinical and methodological collaborators from the United States and
92 China. Many items were adapted from previous surveys.(5-8, 11, 13, 15, 17-25) Our survey
93 instruments captured demographic information, attitudes towards hand surgery, perceptions
94 of the other specialty, and recommendations regarding surgical intervention in two clinical
95 scenarios. Both clinical cases (Appendix 1) focused on metacarpophalangeal (MCP) joint
96 arthroplasty because it is recognized as a mainstay of reconstruction for rheumatoid joint
97 deformities and there is ample evidence for its indications and outcomes. Clinical

98 indications include radiographic findings of MCP joint destruction or dislocation, palmar
99 subluxation, ulnar deviation, and interphalangeal joint stiffness.(4, 9, 10, 18) Case 1 did not
100 meet these criteria, whereas Case 2 was a candidate for MCP joint arthroplasty.

101 Expert review by clinical and methodological collaborators from the United States
102 and China was performed to evaluate the content, wording, and structure of the surveys.(26,
103 27) Two different researchers then translated the surveys into Chinese and back-translated
104 them to English. A third compared the back-translation to the original English.(22) This
105 stepwise method of translation was used to ensure the accuracy of the survey content. We
106 revised the Chinese surveys to address any differences between the original and back-
107 translated versions. Then clinical collaborators from the Beijing Hospitals reviewed both
108 questionnaires for content and language. The final instruments had 26 items for
109 rheumatologists and 31 for hand surgeons, and took about 10 minutes to complete.

110

111 **Data collection**

112 Rheumatologists and surgeons were recruited from three hospitals. We approached
113 clinicians before or after their clinics at two sites, and at the third, rheumatologists were
114 surveyed at a departmental meeting. In addition, we distributed surveys to all doctors
115 attending a morning session of the national conference. These surveys were collected at the
116 end of the presentations. Surveys were exempt from written informed consent because
117 participation was restricted to voluntarily completing an anonymous survey. Each
118 participant was offered a pen for participating.

119

120 **Data analysis**

121 Data were organized by medical specialty and descriptive statistics were calculated
122 for questionnaire responses and demographic data. We compared responses between
123 specialty groups using Wilcoxon-Mann Whitney tests for continuous variables and Chi-
124 square tests or Fisher exact tests for categorical variables.

125

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RESULTS

127 Fifty-nine rheumatologists representing 38 hospitals from 19 provinces completed
128 the questionnaires. Thirty-four hand surgeons from Beijing, as well as one from Taiwan
129 participated. All physicians and surgeons (100%) approached in clinic agreed to participate
130 in the study. From the rheumatology conference, 48 rheumatologists were invited to
131 participate. Thirty-six (75%) returned completed surveys, of which 25 met our eligibility
132 criteria (i.e. had completed their residency training). In our sample, hand surgeons were
133 older, had been in practice longer, and were more likely to be male than rheumatologists;
134 5% of rheumatologists and 17% of hand surgeons had trained with members of the other
135 specialty. Only five doctors had received training outside of mainland China, including in
136 England and Taiwan. Detailed respondent characteristics are shown in Table 1.

137

138 **Attitudes towards management of rheumatoid hand deformities**

139 Most rheumatologists (81%) and hand surgeons (80%) estimated that hand
140 deformities occur in over 50% of RA patients; prior research indicates the prevalence is
141 around 70%.⁽¹⁾ Nearly all respondents agreed that surgery can correct RA hand deformities
142 (Table 2), except for 8% of rheumatologists (compared to 0% of hand surgeons, $p = 0.007$).
143 Hand surgeons were significantly more likely to endorse the availability of good or
144 excellent evidence supporting MCP joint arthroplasty (49% vs. 14%, $p < 0.0001$) and to be
145 satisfied with their ability to treat RA hand deformities (62% vs. 41%, $p = 0.04$). Despite this
146 satisfaction only a minority of rheumatologists (10%) and hand surgeons (17%) felt that
147 they had received adequate training in this area.

148

149 **Attitudes towards the other specialty**

150 Roughly one-third of participants felt that rheumatologists and hand surgeons agree
151 on how to manage rheumatoid hand sequelae and less than one-half felt that the other
152 specialty refers/operates at the appropriate time (Table 3). Hand surgeons were less likely
153 to report positive views of rheumatologists' management than rheumatologists of surgeons'
154 (40% vs. 53%, $p = 0.07$).

155

156 **Response to clinical cases**

157 Specialists responded differently to the clinical cases (Appendix 1), which included
158 early (Stage 1) hand involvement with Swan-Neck and Boutonnière deformities (Case 1)
159 and advanced joint disease (Stage 3) with ulnar deviation and moderate deterioration of
160 articular cartilage (Case 2). Thirty percent of rheumatologists recommended MCP
161 arthroplasty in Case 1 compared to 14% of hand surgeons ($p = 0.08$). There was no
162 difference for Case 2 (95% vs. 91%, $p=0.50$).

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DISCUSSION

166 To assess knowledge and attitudes regarding hand surgery for rheumatoid arthritis
167 in China, we performed a pilot survey of 59 rheumatologists and 35 hand surgeons at three
168 large tertiary hospitals in Beijing. Our results show that few doctors trained with members
169 of the other specialty, yet more than half report regular consultations to each other about
170 RA patients. Nearly all respondents agreed that surgery can correct RA hand deformities.
171 However, a subset also indicated that drug therapy can do the same (which it cannot).
172 Surgeons and rheumatologists disagreed about the availability of good or excellent
173 evidence supporting the use of MCP arthroplasty for RA, and differed in their
174 recommendations for surgical treatment for early stage RA hand deformities. Most
175 respondents indicated that their training on this topic was insufficient. Although, the
176 interspeciality discrepancies are similar to controversies found in the United States, our
177 results also suggest that doctors in China are not completely aware of indications for hand
178 surgery or its benefits compared to drug therapy for advanced RA joint sequelae.

179 Despite reporting similar attitudes towards each other as have been found in
180 American rheumatologists and hand surgeons, doctors in our study reported less
181 interdisciplinary training and active collaboration about RA patients compared to those in
182 the United States.(15) Alderman et al. found that 33% of hand surgeons and 21% of
183 rheumatologists in the United States were exposed to the other specialty during training,
184 and 78% and 81%, respectively, have an active referral exchange with the other
185 specialty.(13) Only 17% of surgeons and 5% of rheumatologists in this study reported
186 training with each other and fewer (57%, 58%) reported regularly consulting with the other

187 specialty. This may contribute to the lower rates of rheumatoid hand surgery observed in
188 China compared to the United States, as coordination is key for operative management of
189 RA hand deformities. Careful selection of patients and planning are necessary for hand
190 surgery, a local intervention, to be applied correctly within the context of a systemic
191 disease.

192 . Our data suggest an insufficient knowledge of current evidence regarding
193 rheumatoid hand surgery among rheumatologists and hand surgeons in China, which is
194 concerning because it could preclude judicious applications of procedures such as MCP
195 joint arthroplasty. First, 20% of rheumatologists and 29% of hand surgeons believed that
196 drug therapy can correct RA hand deformities. Medication management is indispensable for
197 controlling RA, but it cannot alter hand deformities or joint destruction once these sequelae
198 have occurred. Second, 30% of rheumatologists and 14% of hand surgeons recommended
199 MCP arthroplasty in the first clinical scenario (Stage 1 RA), which does not meet
200 established clinical indications for this intervention. Lastly, only 10% of rheumatologists
201 and 17% of hand surgeons felt that they received adequate training in the management of
202 RA hand deformities. This implies that doctors, particularly non-surgeons, are not fully
203 prepared to treat RA hand deformities or familiar with literature about their management.
204 This may impair their ability to make appropriate referrals and could translate into
205 misconceptions among patients who rely on rheumatologists to guide RA treatment
206 decisions. Hand surgeons must also be aware of when and if to intervene, as patient
207 selection is very important to achieving good outcomes.(10)

208 Several limitations apply to this study. Our samples were modest and collected from
209 one city. Beijing and other large cities in China, such as Shanghai, have advanced medical
210 care that may not be available in smaller cities where barriers related to low knowledge of
211 indications and evidence are likely to be even more prevalent. To enhance geographic
212 diversity, we included doctors visiting from other provinces. Next, we asked participants to
213 self-report attitudes and knowledge, which may not directly reflect practice patterns. Lastly,
214 the appropriateness of reconstruction for RA hand deformities is subject to other factors
215 that were not addressed in this study, such as the patients' needs and preferences,
216 comorbidities, acclimation to hand symptoms, and disease control.(10) The scope of this

217 study, however, was to assess clinicians' knowledge of surgical indications, which we were
218 able to capture by asking whether or not they would recommend intervention in specific
219 clinical scenarios.

220 The findings from this survey of 94 rheumatologists and hand surgeons highlight
221 the issue of low rates of rheumatoid hand surgery in China and help to illuminate clinician-
222 related factors that contribute. Namely, it uncovered interspeciality disagreements and
223 inadequacies in training that could hurt collaborative relationships and limit clinical
224 expertise, as well as recommendations and beliefs about the treatment of RA hand
225 deformities that do not adhere to current evidence. These issues create barriers to RA
226 patient care and rheumatoid hand surgery. Through highlighting them, we hope to
227 encourage and broaden access to evidence based management of rheumatoid hand
228 conditions in China.

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FIGURE 1. Clinical Cases

Case 1: A 60-year-old woman with rheumatoid arthritis who is otherwise healthy presents to you for treatment. She has synovitis at the metacarpophalangeal joints, minimal ulnar deviation, and little extension lag of the fingers. She does not complain of pain, and has little trouble completing daily tasks except when her joints are swollen in the morning. (See picture below).



In your clinical opinion, would this patient benefit from metacarpophalangeal arthroplasty?

- a. Yes
- b. No

If she would benefit from metacarpophalangeal arthroplasty, how soon should she have it? Leave blank if you answered 'No' to the previous question.

- a. As soon as possible
- b. During the next 6 months
- c. During the next year
- d. More than 1 year from now

Case 2: A 60-year-old woman with rheumatoid arthritis who is otherwise healthy presents to you for treatment. Her radiographs show moderate erosion of the articular cartilage. She does not complain of pain but has difficulty completing some activities of daily living (such as buttoning buttons or holding a glass) because of her ulnar deviation and the inability to flex her fingers wide and grasp onto objects. (See picture below).



In your clinical opinion, would this patient benefit from metacarpophalangeal arthroplasty?

- c. Yes
- d. No

If she would benefit from metacarpophalangeal arthroplasty, when how soon should she have it?
Leave blank if you answered 'No' to the previous question.

- a. As soon as possible
- b. During the next 6 months
- c. During the next year
- d. More than 1 year from now

Table 1. Respondent Characteristics			
	Rheumatologists (n = 59)	Hand Surgeons (n = 35)	p-value
Mean age (range)	37.5 (28-60)	42.5 (26-60)	0.01
Female (%)	66%	14%	<0.0001
Male (%)	34%	86%	
Doctoral (MD) degree (%)	36%	49%	0.12
Specialty fellowship (%)	25%	83%	<0.0001
Medical training abroad (%)	5%	6%	0.88
Years in practice			0.005
< 5 years	29%	14%	
5 – 9 years	44%	26%	
10 – 19 years	17%	20%	
> 20 years	10%	37%	
Trained with the other specialty (%)	5%	17%	<0.0001
Practice devoted to RA patients			<0.0001
0%	0%	6%	
< 25%	7%	91%	
25-49%	59%	3%	
50-74%	29%	0.0%	
75-99%	3%	0.0%	
100%	2%	0.0%	

Table 2. Attitudes towards Management of Rheumatoid Hand Deformities			
	Rheumatologists (n = 59)	Hand Surgeons (n = 35)	p-value
Satisfied with ability to manage RA hand deformities	41%	62%	0.04
Feel that training received in management of RA hand deformities was adequate	10%	17%	0.35
Agree that drugs can correct hand deformities	20%	29%	0.21
Agree that surgery can correct RA hand deformities	92%	100%	0.007
Feel there is good or excellent evidence supporting metacarpophalangeal arthroplasty for RA hand deformities	14%	49%	<0.0001

Table 3. Attitudes towards the other Specialty			
	Rheumatologists (n = 59)	Hand Surgeons (n = 35)	p-value
Feel that rheumatologists and hand surgeons agree on the management of rheumatoid arthritis patients' hand disabilities.	31%	37%	0.93
Feel that members of other specialty appropriately manage RA hand deformities	53%	40%	0.07
Feel that hand surgeons operate on RA patients at the appropriate time / rheumatologists refer RA patients at the appropriate time	40%	46%	0.13
Feel that hand surgeons are too aggressive in treating RA patients / rheumatologists are too passive in treating RA patients	40%	57%	0.12
Regularly consult with a hand surgeon/rheumatologist about my rheumatoid arthritis patients' treatment	58%	57%	0.89

Author