

An Analysis of Women's and Men's Surgical Priorities and Willingness to Have Rheumatoid Hand Surgery

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Purpose: Our prior national study showed gender differences in the rates of rheumatoid arthritis hand surgery. This project evaluated whether men's versus women's preferences, as opposed to physician biases, contribute to these variations.

Methods: A self-administered questionnaire was administered to 126 patients with rheumatoid arthritis at our institution; 117 (93%) of these patients completed the questionnaire. Chi-square tests, *t* tests, the Wilcoxon rank sum test, and multiple logistic regressions were used for the analyses. The results were compared with our national mailed survey of 500 rheumatologists and 500 hand surgeons in the United States that evaluated physicians' attitudes toward the indications and outcomes of rheumatoid hand surgery.

Results: When we asked physicians who values hand aesthetics more, 378 (73%) chose women compared with less than 2 (1%) who chose men; when asked who values hand function more, 35 (7%) chose women, 83 (16%) chose men, and 396 (77%) thought there was no difference; and when asked who is more willing to have hand surgery, 219 (43%) chose women compared with 6% who chose men. In this patient survey, however, women and men were equally willing to have hand surgery, and they placed equal value in hand appearance, function, and pain. Women, however, appeared more risk adverse and concerned about the potential pain and inconvenience from surgery.

Conclusions: Physicians' biases appear to conflict with patient preferences regarding rheumatoid hand surgery. Physicians should understand patients' preferences during the shared decision-making process for surgery. (*J Hand Surg* 2006;31A:1447-1453. Copyright © 2006 by the American Society for Surgery of the Hand.)

Key words: Rheumatoid arthritis, gender, hand surgery, Michigan Hand Outcomes Questionnaire.



Surgical practice patterns for treating rheumatoid arthritis (RA) hand deformities vary widely by geographic treatment location and patient gender.¹ Our prior studies^{2,3} have shown that the large area variation in the rate of RA hand surgery in the United States is mainly the result of disagreements between rheumatologists and hand surgeons regarding the indications, timing, and outcomes of surgical treatments for RA hands. In addition, compared with men, women with RA are less likely to receive early prophylactic procedures such as tenosynovectomy but are more likely to have end-stage procedures such as arthroplasty and arthrodesis.^{2,3} The implications of these findings

are still unclear. Although physician and health care constraints may be responsible for the practice variations, the impact of patient factors, in particular RA patients' priorities and preferences for hand surgery, may contribute a great deal to the practice variations.

Rheumatoid arthritis affects 1% of the U.S. population, and hand dysfunction is a major cause of disability in this population.⁴⁻⁷ Exploring physician and patient attitudes toward reconstructive hand surgery procedures is an important first step in understanding the large area variations in the rate of hand surgery procedures in this country. The purpose of this study was to better understand RA patients' hand priorities with regard to their

willingness to have hand surgery and their priorities regarding improvements in hand function, pain, and aesthetics. In addition, we wanted to compare physicians' attitudes toward patients' hand priorities with patients' actual preferences. We hypothesized that (1) physicians believe that men value hand function more than women whereas women value hand aesthetics more than men, (2) women are just as willing to have hand surgery as men, and (3) both women and men have similar priorities for hand surgery.

Materials and Methods

Study Population

A self-administered, cross-sectional survey was mailed to rheumatologists and hand surgeons between October and December of 2001. The study population consisted of a random sample of 500 members of the American College of Rheumatology (10% of eligible members) and 500 members of the American Society for Surgery of the Hand (30% of eligible members) and was limited to active physician members (excluding trainees) of each professional organization who lived in the continental United States. The sample was randomly generated from a computer model using the 2001 membership registry of both organizations and was not based on zip code, age, or duration of professional membership.

A self-administered survey was also distributed to consecutive RA patients at our institution's rheumatology clinic between June and August of 2005. Eligibility was based on a diagnosis of RA. Patients were consecutively approached by the research team and asked to participate in the study. Those who declined participation were asked a few demographic questions that enabled us to check for a nonresponse bias. A study sample of 117 was chosen for an adequately powered study, and men were oversampled to ensure that the gender distribution (slightly less than 2 women per 1 man) was sufficient for the analyses and adequately represented the national prevalence of the disease.⁴ The response rate we obtained for men and women gave us the ability to detect a critical difference or effect size of 0.11 with 80% probability using a 90% confidence interval. This would correspond to Cohen's traditional definition of a medium effect size ($.02 < f^2 < .15$),⁸ which is the effect size of 85% of psychology research using categorical variables.⁹ This sample size should be adequate to detect small differences in patient preferences.

Survey Design

Before designing the physician survey, we performed a comprehensive literature review on surgical procedures

for RA hand deformities using the MEDSEARCH database. Discrepancies in outcomes data or areas of physician discontent were discussed with rheumatologists and hand surgeons in both the university and community settings through in-depth personal interviews. Information from the interviews and the literature search were incorporated into the survey. Pilot testing of the survey was then performed by administering the survey to a sample of local physicians from both specialties to ensure content validity. Institutional review board approval was obtained from the University of Michigan to administer the survey to a national sample of physicians.

The physicians received mailings of the questionnaire in 2 waves to increase the response rate. The first mailing was accompanied by a \$2.00 writing pen as a small gift of appreciation, and receipt of a completed survey made the responder eligible for a Palm Pilot raffle. Incentive gifts are standard techniques in survey research to improve response rates, especially with physician surveys, which generally have low response rates.^{10,11} The survey took approximately 10 minutes to finish, which corresponds to the recommended survey length,¹² and it focused on the indications and timing of different types of surgical procedures for rheumatoid hand disease.

Based on the results of the physician survey, along with in-depth personal interviews with RA patients, a patient survey was developed and pilot tested among a convenience sample of University of Michigan patients. This survey also included components of the Michigan Hand Outcomes Questionnaire, which has been previously validated.^{13,14} The Michigan Hand Outcomes Questionnaire has been used to evaluate outcomes for a variety of hand surgery conditions¹⁵⁻¹⁸ and is particularly responsive for rheumatoid hand conditions.¹⁹⁻²² The use of the Michigan Hand Outcomes Questionnaire gives us the ability to control for severity of hand disease in our statistical analyses.

The survey took approximately 10 minutes to complete and focused on patients' hand priorities and willingness for surgical interventions. (Appendix 1 can be viewed online at the *Journal's* Web site, www.jhand-surg.org.) Patients received a small incentive gift of \$2.00 value. For nonresponders, sociodemographic data were collected. Institutional review board approval for the patient survey was obtained from the University of Michigan.

Data Analysis

Both physicians and patients were asked to answer questions with responses organized on a 5-point Likert

Table 1. General Demographic Data of Sample Population

Characteristic	Women	Men	p
n (%)	77 (66)	40 (34)	
Age, y (mean \pm SD)*	50 \pm 16	56 \pm 15	.057*
Have hand surgeon, n (%)†	11 (15)	7 (18)	.669†
Have had hand surgery, n (%)†	12 (16)	12 (30)	.073†
Race, n (%)†			
White	64 (83)	35 (88)	.533†
African American	9 (12)	1 (3)	.161‡
Other	1 (1)	2 (5)	.269‡
Asian	2 (3)	2 (5)	.600‡
American Indian	1 (1)	0 (0)	.520‡
Education, n (%)†			
Less than high school	1 (1)	2 (5)	0.269‡
High school graduate	16 (21)	7 (18)	0.669†
Some college	29 (39)	13 (33)	0.575†
College graduate	13 (17)	11 (28)	0.177†
Graduate school	16 (21)	6 (15)	0.445†

**t* test.

†Pearson chi-square test.

‡Fisher exact test.

scale (1, always; 2, usually; 3, occasionally; 4, rarely; 5, never), which is a standard format for survey responses.²³ To compare the demographic characteristics of the male and female patients, we used *t* tests for continuous variables such as age and chi-square and Fisher exact tests for categoric variables such as education. The categoric responses of physicians and patients were each analyzed with the Pearson chi-square test. The Likert scale responses were analyzed using the Wilcoxon rank sum test. For the logistic regression models, the primary dependent variables of interest were willingness to have hand surgery for appearance, function, and pain. The 12-point scale was collapsed into a dichotomous variable, with responses 0 through 3 equating to a positive response and 4 through 11 a negative response. The effects of patient gender were assessed in a stepwise multiple logistic regression model that controlled for patient age and disease severity (hand function, history of hand surgery). The Wald test and the likelihood ratio test were used to test the significance of individual predictive variables, and the model chi-square statistic was applied to test the overall significance of the models. All analyses were performed with statistical software (SAS Version 9.1; SAS Institute Inc., Cary, NC), and the statistical significance was set at $p \leq .05$.

Results

Of the 1,000 physicians surveyed, 31 were considered ineligible (9 wrong addresses, 12 without clinical ex-

perience, 1 deceased, 9 retired). In all, 515 (53%) eligible physicians returned completed questionnaires, which is an acceptable response rate.²³ In particular, the response rate was 58% from the hand surgeons and 49% from the rheumatologists. The groups are similar in age and gender, although surgeons were more likely to be men than were rheumatologists ($p = .01$). No significant differences were found in the gender of responders and nonresponders in either specialty or in the demographics of responders from the first and second mailings.

A total of 126 patients were surveyed in this study (Table 1). There were 9 nonresponders (93% response rate) who had no significant demographic differences compared with the responders. Most of the patient sample population was white and had at least some college education; this demographic characteristic was indicative of patients in the vicinity of a major university. Few patients (11 (15%) women, 7 (18%) of men) currently had a hand surgeon or had had hand surgery in the past (12 (16%) women, 12 (30%) men). There were no significant differences in demographic characteristics between the women and men. Table 2 shows the severity of hand disease in the study sample.

Rheumatologists and hand surgeons were asked about their impressions of the hand priorities of men and women with RA (Table 3). When asked who placed a higher value on hand aesthetics, physicians perceived women as valuing hand aesthetics significantly more than men (378 (73%) vs <1%, respectively; $p < .001$). However, 396 (77%) physicians thought that there was no difference between wom-

Table 2. Summary of Hand Disease Severity in the Study Population

Question	Responded Very Poor or Poor	
	Women, % (n = 77)	Men, % (n = 40)
The following questions refer to the function of your hand(s)/wrist(s) during the past week.		
1. Overall, how well did your hand work?	12	13
2. How well did your fingers move?	12	13
3. How well did your wrist move?	18	15
4. How was the strength in your hand?	35	35
5. How was the sensation (feeling) in your hand?	14	45

Table 3. Rheumatologists' and Hand Surgeons' Perceptions of the Hand Priorities of Men and Women With Rheumatoid Arthritis (N = 515)

Question	Physicians' Responses			
	Women, n (%)	No Difference, n (%)	Men, n (%)	p*
Who values aesthetics more?	378 (73)	135 (26)	2 (1)	<.001
Who places a higher priority on hand function?	35 (7)	396 (77)	83 (16)	<.001
Who is more willing to have surgery?	219 (43)	266 (52)	29 (6)	<.001

*Pearson chi-square test.

en's and men's value of hand function. Although 266 physicians (52%) believed there was no difference between women's and men's willingness to have surgery, 43% perceived women as being more willing to have a surgical hand intervention (compared with only 29 (6%) for men, $p < .001$).

Figure 1 shows patients' hand priorities with regard to appearance, function, and pain. Most women and men ranked either hand function or hand pain as the primary hand concern, with no significant difference in the ranking of these 2 priorities by patient gender. Few patients ranked hand appearance as the primary concern, and we found no significant gender difference for this factor. To look more closely at the aesthetic priorities of women and men, we asked patients about their feelings toward the appearance of their worse hand (Figure 2). Roughly half of patients were satisfied with the appearance of the hands, but 30% to 40% of patients felt some level of discomfort in public situations because of hand aesthetics. Therefore, the appearance of the RA hand is an important consideration for a substantial percentage of RA patients. No significant differences were found between men's and women's feelings about hand appearance. There was a trend, however, for men to be more concerned about hand appearance as it relates to social situations, specifically public appearances and social activities.

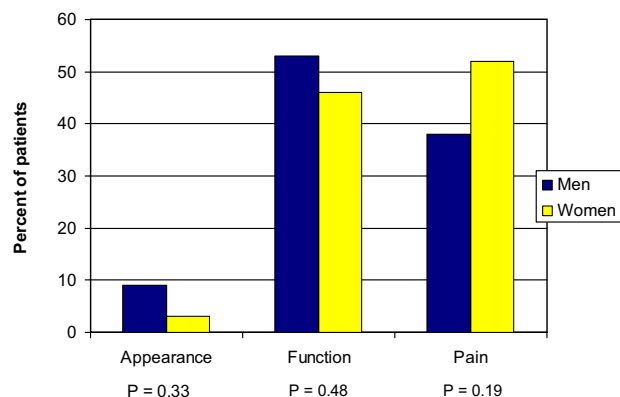
**Figure 1.** Patients' highest priority for their hands.

Table 4 shows women's and men's willingness to have surgical intervention for RA hand disease to improve appearance, function, and pain. Logistic regression results controlling for disease severity, history of hand surgery, and patient age showed no significant differences in willingness to have surgery for appearance, function, or pain between men and women. Of the 3 surgical indications presented, pain appeared to garner the largest proportion of patients willing to have hand surgery. A large proportion of patients, however, were uncertain about whether they would pursue surgery for the 3 indications presented. This finding confirmed the traditional teaching of RA hand surgery that understanding patients' needs and priorities should be the foremost consideration for RA surgeons in counseling for surgical reconstruction. The presence of correctable hand deformities alone is not an indication for surgical reconstruction.

Patients were then asked what concerned them most about having RA hand surgery (Table 5). The subscale items ranged across a variety of elements that may affect a patient's decision-making process and that may vary by patient gender, such as inconvenience from surgery, pain, surgical risks, fear of unknown factors, and trust in surgeon. Compared with men, women were significantly more concerned about the potential inconveniences of surgery, pain, risk of anesthesia, and surgical complications.

Discussion

Rheumatoid hand surgery may be considered a preference-sensitive medical choice, because the disease process can be debilitating but is not life threatening. In addition, no clear agreement exists among rheumatologists and hand surgeons regarding the surgical management of this patient population or the effectiveness of RA hand procedures. Because of the patient gender variations we have found in RA hand procedures (men have higher rates of tenosynovectomy, women have higher rates of arthrodesis and arthroplasty), our aim was to evaluate what may be driving these variations—

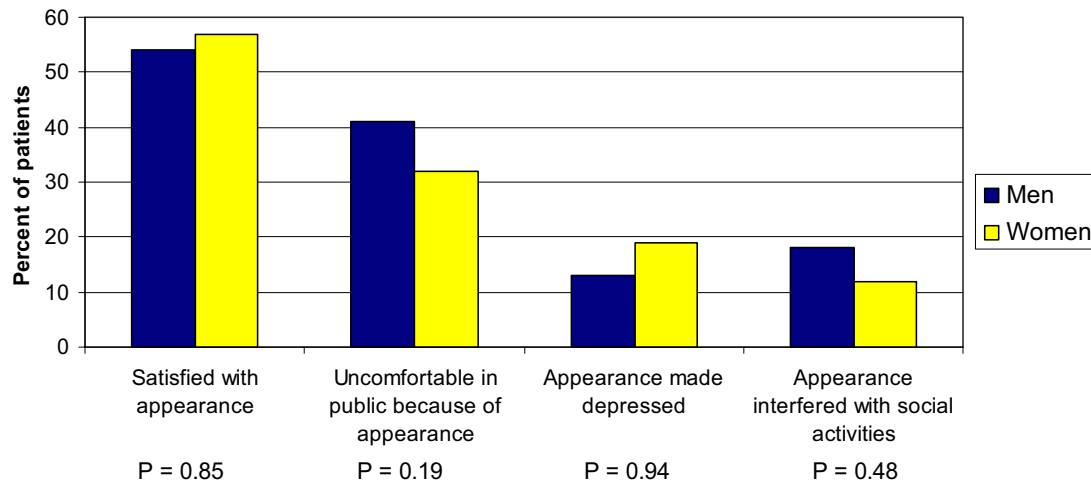


Figure 2. The percentage of RA patients who strongly agree or agree with the statements regarding the appearance of their worse hand.

physicians' beliefs about women's and men's hand priorities or patients' willingness to have surgery.

The issue of hand aesthetics is often overlooked in hand surgery, because the primary surgical focus is to improve function. Several hand procedures, however, improve aesthetics more than function such as metacarpophalangeal arthroplasty for RA disease or centralization of a radial club hand.²⁴ Some data^{19,25} also suggest that patient satisfaction with hand surgery is related to the aesthetic outcome. It should be noted that 30% to 40% of the patients we surveyed felt uncomfortable with public appearances because of their RA hand deformities, and 10% to 20% of patients believed their hand deformities contributed to depression or interfered with social activities. Aesthetics has undertaken a negative connotation, especially in the current era of wide-

spread cosmetic surgery, but the true meaning—to restore original beauty and design²⁴—should be remembered, because these devastating deformities seem to affect patients' psychosocial well-being. Although physicians perceive women as valuing hand aesthetics more than men, our survey indicates that men and women are equally concerned about hand aesthetics.

In many areas of surgery such as transplant, cardiac, and orthopedic surgery women tend to present with more severe disease and receive less aggressive care^{26–35}; the reason for this delayed care—unwillingness for surgical intervention, physician bias,^{36,37} or access barrier—is unclear. The same pattern exists in rheumatoid hand surgery, with men more likely than women to receive an early, prophylactic hand procedure such as

Table 4. Men's and Women's Willingness to Have RA Hand Surgery for Appearance, Function, and Pain

Reason for Surgery	Definitely Have Surgery, n (%) [*]	Uncertain, n (%) [*]	Definitely Not Have Surgery, n (%) [*]	pt [†]
Appearance				
Women	11 (15)	33 (45)	30 (40)	.302
Men	10 (26)	13 (33)	16 (41)	
Function				
Women	20 (27)	37 (49)	18 (24)	.886
Men	10 (26)	18 (46)	11 (28)	
Pain				
Women	27 (36)	36 (49)	11 (15)	.181
Men	20 (51)	12 (31)	7 (18)	

Logistic regression model, with responses 0 through 3 equating to a positive response and 4 through 11 a negative response, controlled for disease severity, history of hand surgery, and patient age, showed no significant differences in willingness for surgery between men and women.

^{*}The 12-point scale ranging from definitely have surgery (responses 0–3) to definitely not have surgery (responses 7–11) was collapsed for ease of reporting.

[†]Pearson chi-square test.

Table 5. Men and Women's Concerns Regarding RA Hand Surgery

What are your concerns regarding hand surgery?	Responded Very Much or Much		
	Women (%) (n = 77)	Men (%) (n = 40)	P Value*
1. Recovery time from surgery	53	35	0.05
2. Pain or discomfort from surgery	49	38	0.02
3. Inability to perform activities of daily living in the recovery period after surgery	65	56	0.15
4. Risk of anesthesia	32	11	0.04
5. Risk of a surgical complication, like an infection or wound problem	47	23	0.03
6. Inability of surgery to obtain your desired results	51	46	0.61
7. Not knowing others who have had hand surgery	26	14	0.09
8. Surgeon's technical ability	58	67	0.23
9. Surgeon's interpersonal skills	44	42	0.91

*Wilcoxon rank sum test based on 5-point Likert scale (Very Much/Much/A Fair Amount/A Little/Not at All); responses were grouped into very much and much for ease of reporting.

tenosynovectomy. Our data, however, suggest that women and men are equally willing to have hand surgery for aesthetics, function, and pain, which correlates with other data^{3,30,38} regarding women's and men's willingness to have surgery.

Compared with men, women are more concerned about the postoperative recovery time, postoperative pain, and risk of anesthesia or of a surgical complication. These data correlate with other gender utilization studies^{39,40} that have found women to be more fearful of surgery and more willing to delay surgery to await better technology and to avoid disrupting caregiver roles. An individual's attitude toward risk affects treatment choice.⁴¹ Therefore, women's higher risk aversion may affect their surgical decision-making process and contribute to their lower rates of tenosynovectomy procedures compared with men, especially if these procedures are presented as more elective than the other end-stage types of procedures.

Although this study aimed to provide a broad generalization of RA patients, it has limitations. It was not a randomized or multi-institutional study, so the sample may not be generalizable to the entire RA population. In addition, type II errors may have occurred because of the unequal distribution of men compared with women in the study. We also are lacking details about the referral process to hand surgeons and physician-patient interaction for female and male patients. It may be that women are less likely to receive earlier surgical treatment because they are more likely to decline a surgical consultation compared with men, or, as with cardiac catheterization,⁴² it may be that physicians are less likely to recommend some surgical interventions to women compared with men.

Physicians need to be aware of potential inconsistencies between personal biases and patient preferences,

especially when dealing with patients who have passive medical decision-making styles. In addition, the need for objective outcome data with RA hand surgery is clear. Many patients are uncertain about their willingness to have RA hand surgery and could benefit from prospective data on the functional, psychosocial, and complication outcomes of these procedures. In this population, a decision aid may help facilitate the surgical decision by improving patient knowledge and decreasing patient anxiety. This is especially pertinent to women, who appear more risk adverse and have greater concerns about surgical outcomes. The implication of this study is to encourage physicians who care for the RA population to engage in a shared medical decision-making model that facilitates patients' expressions of their preferences while limiting physician biases.

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