

# Doctor shopping trend of patients before undergoing rotator cuff repair in Korea: a multicenter study

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**Background:** This study aims to investigate the trend of doctor shopping among patients with rotator cuff tear (RCT) before undergoing surgery and to examine the relevance of these findings to the public.

**Methods:** A survey was conducted of 326 patients from 10 hospitals (male, 176; female, 150) who underwent arthroscopic rotator cuff repair (ARCR) for symptomatic RCT between September 2019 and February 2020. A questionnaire was used to obtain data regarding the type of medical care service, medical institutions visited before surgery, number of treatments received, and cost of treatment.

**Results:** A total of 326 patients (87%) received treatment at least once at another medical institution before visiting the hospital where the surgery was performed. Patients visited an average of 9.4 health providers or physicians for shoulder pain before visiting the hospital where surgery was performed. Among the 326 patients, 148 (45%) visited more than two medical institutions and spent an average of 641,983 Korean won (KRW; \$466, 50,000–5,000,000 KRW) before surgery. Medical expenses before surgery were proportional to the number of medical institutions visited ( $P=0.002$ ), symptom duration ( $P=0.002$ ), and initial visual analog scale (VAS) pain score ( $P=0.007$ ) but were not associated with sex, age, VAS pain score immediately before surgery, or RCT size.

**Conclusions:** Medical expense before ARCR was associated with the severity of preoperative pain and duration of symptoms. After onset of shoulder symptoms, patients should visit as soon as possible a hospital that has surgeons who specialize in shoulder repair to prevent unnecessary medical expense and proper treatment.

**Level of evidence:** IV.

**Keywords:** Rotator cuff repair; Doctor shopping; Preoperative; Cost

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## INTRODUCTION

The prevalence of shoulder pain is a significant concern globally, ranking as the third most common type of joint discomfort following back and knee issues [1]. The number of patients charged with the healthcare code for shoulder lesions in Korea has gradually increased from approximately 7,165 cases per 100,000 people in 2011 to 10,333 cases in 2020 [2]. In the United Kingdom, 2% of primary healthcare consultations are due to shoulder pain [3]. Among these, full-thickness rotator cuff tears (RCTs) are a primary cause of pain and disability, accounting for 30%–70% of shoulder-related medical visits [4,5]. The prevalence of non-traumatic RCTs increases with age and is observed in up to 13% of individuals younger than 60 years and between 28% and 51% of subjects older than 60 years [6]. Left unmanaged, these tears often worsen through enlargement, muscle atrophy, fatty infiltration, and force-couple imbalance, potentially leading to rotator cuff arthropathy [7,8].

The RCT, a prevalent cause of debilitating shoulder pain, accounts for millions of healthcare visits annually [4,9]. Although arthroscopic rotator cuff repair (ARCR) is often used to address significant tears, the path to surgery is frequently protracted and involves substantial healthcare utilization and costs [10,11]. This process typically includes diagnostic evaluations, multiple physician visits, and various nonoperative treatments aimed at alleviating symptoms [5,11].

Surgical intervention for full-thickness RCTs is widely acknowledged as an effective means of providing significant clinical improvement and reversing symptoms [12-14]. However, despite the clear socioeconomic and health impacts of RCTs, care delivery remains inconsistent. Local healthcare delivery is often fragmented, with patients experiencing varying access levels, outcomes, and costs for similar conditions [15]. These disparities have short- and long-term adverse implications for both patients and the broader healthcare system. Furthermore, the strain of rising global health costs on already tight fiscal budgets exacerbates these issues, highlighting the urgency for a more standardized and efficient approach to managing shoulder pain and RCTs [16].

Patients often visit multiple health care providers to obtain a desired medical opinion, diagnosis, or treatment, which is characterized and termed “doctor shopping” and defined as visiting multiple treatment providers during a single illness. Although the reasons for doctor shopping vary, patients with a diagnosis of RCT may seek a second medical opinion and engage in various nonoperative treatment modalities, including physical therapy, corticosteroid injections, and pain management [5,10,11]. Al-

though these measures can be a part of standard health care and professional referral systems, their utilization patterns, cost implications, and effects on the surgical outcome have not been frequently studied. Some studies suggest underutilization of potentially beneficial nonoperative treatments, while others indicate excessive and perhaps unnecessary preoperative costs, particularly associated with advanced imaging and repeated healthcare visits [17,18].

Understanding the trends and cost distribution of preoperative care is essential for developing more cost-effective and patient-centered treatment pathways. Therefore, the purpose of this study was to evaluate the trend of doctor shopping by patients in the Korean population before undergoing rotator cuff repair, focusing on patterns of hospital visits and costs.

## METHODS

The Institutional Review Board of Yeouido St. Mary’s Hospital approved this study (No. SC24RISI0023) and waived informed consent due to the retrospective nature of the study. This was a multicenter study conducted by the Public Relations Committee of the Korean Shoulder and Elbow Society. From September 2019 to February 2020, 326 patients who underwent ARCR at 10 major training hospitals nationwide were included in the study. The inclusion criteria were patients that visited the hospital for shoulder pain, were diagnosed with symptomatic RCTs, and underwent ARCR. Patients with infections, previous fracture, or surgery in the same area of the shoulder joint were excluded from the study. Data regarding sex, age, symptom duration, initial visual analog scale (VAS) pain score, total number of visited hospitals, types of treatment, and medical expenditure before undergoing ARCR were collected. VAS pain score immediately before surgery and RCT size were also recorded. The total number of hospital visits included all types of healthcare service visits from the time the of shoulder pain onset until initial surgery. Hospital types were categorized into orthopedic clinic, pain/rehabilitation clinic, oriental clinic, and others. The nonoperative treatment modalities listed were corticosteroid injection, physiotherapy, prolotherapy, manual therapy, extracorporeal shock wave therapy (ESWT), collagen injection, and polydeoxyribonucleotide (PDRN) injection. Treatments from the oriental medicine clinic were categorized into acupuncture, moxibustion, herbal medicine, and chiropractic (choona). Medical costs were calculated in Korean won (KRW) and comprised all money spent after diagnosis of RTC and before surgery. The treating surgeons intraoperatively measured the anteroposterior and mediolateral tear sizes in mm.

### Statistical Analysis

Multivariate regression was performed to investigate the associations between total expenditure prior to receiving ARCR and variables. A P-value less than 0.05 was considered statistically significant. All statistical analyses were performed using SPSS software version 21.0 (IBM Corp.).

## RESULTS

Demographic characteristics of patients including sex, age, symptom duration, initial VAS pain score, duration of shoulder pain before ARCR, total number of hospital visits, types of treatment, and medical expenditure before undergoing ARCR are summarized in Table 1. The average patient age was 61 years and ranged from 42 to 82 years. The study included 176 male and 150 female patients. On average, patients experienced symptoms for 19 months before seeking treatment, ranging widely from 1 to 121 months. VAS pain score at the first hospital visit ranged from 2 to 10 and averaged 5.3. The preoperative VAS pain score also ranged from 2 to 10 with an average of 5.3. The anteroposterior tear size averaged 18.3 mm and ranged from 3 to 45 mm. The mediolateral size averaged 16.5 cm and ranged from 5 to 44 cm. The number of clinics patients visited before undergoing surgery ranged from 1 to 4 (average, 1.7). A total of 283 patients (87%) received treatment at least once at another medical institution before visiting the hospital where the surgery was performed. Among the 326 patients, 148 (45%) visited more than two medical providers (Fig. 1). Patients visited other medical institutions an average of 9.4 times to treat shoulder pain before visiting the hospital for surgery. The average medical expenditure before surgery was 641,983 KRW (\$466) and ranged widely from 50,000–5,000,000 KRW. Prior to surgery, patients visited other medical facilities: an orthopedic clinic (n = 184, 72%), an oriental medical clinic (n = 88, 31%), a pain clinic (n = 76, 27%), and other clinics (n = 28, 10%) (Fig. 2).

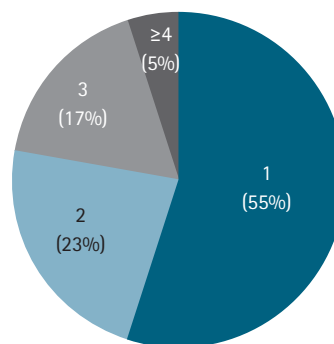
The most common treatment received at oriental medical clinics was acupuncture (55%). In addition, moxibustion (18%), herbal medicine (17%), and choona (10%) were provided in the oriental medical clinics before undergoing ARCR (Fig. 3). The patients who visited pain clinics before ARCR mostly underwent corticosteroid injection (35%). Physiotherapy (25%), prolotherapy (15%), manual therapy (10%), ESWT (7%), collagen injection (4%), and PDRN injection (4%) were also administered to patients in the pain clinics (Fig. 4).

Medical expenses before surgery were proportional to the number of medical institutions visited before surgery (P = 0.002), symptom duration (P = 0.002), and initial VAS pain score

**Table 1.** Demographic characteristics

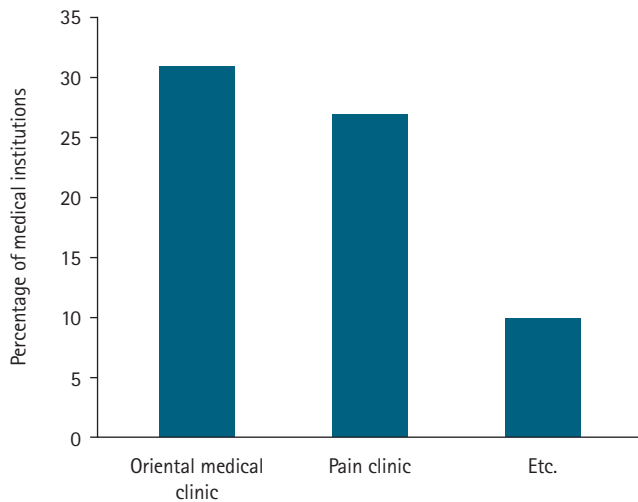
Variable	Value
Age (yr)	61 (42–82)
Total number of patients (male:female)	326 (176:150)
Symptom duration (mo)	19 (1–121)
VAS pain score at first hospital visit	5.3 (2–10)
Preoperative VAS pain score	5.3 (2–10)
Intraoperative RCT size (cm)	
Anteroposterior	18.3 (3–5)
Mediolateral	16.5 (5–44)
Total number of medical institutions visited before undergoing surgery	1.7 (0–4)
Total number of visits to medical institutions before undergoing surgery	9.4 (0–70)
Medical expenditure before undergoing surgery (KRW)	641,983 (50,000–5,000,000)
Total number of patients who visited each type of medical institution	
Orthopedic clinic	184 (72)
Oriental medical clinic	88 (31)
Pain clinic	76 (27)
Others (family medicine clinic, neurosurgery clinic, etc.)	28 (10)
Treatments performed in oriental medical clinics	
Acupuncture	48 (55)
Moxibustion	16 (18)
Herbal medicine	15 (17)
Choona	9 (10)
Treatments performed in pain clinics	
Corticosteroid injection	27 (35)
Physiotherapy	19 (25)
Prolotherapy	11 (15)
Manual therapy	8 (10)
ESWT	5 (7)
Collagen injection	3 (4)
PDRN injection	3 (4)

Values are presented as median (range) or number (%). VAS: visual analog scale, RCT: rotator cuff tear, KRW: Korean won, Choona: chiropractic, ESWT: extracorporeal shock wave treatment, PDRN: polydeoxyribonucleotide.

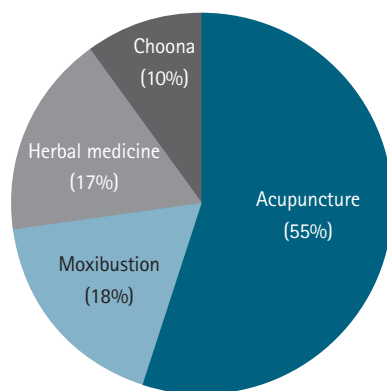


**Fig. 1.** Total number of medical institutions visited prior to receiving arthroscopic rotator cuff repair.

( $P=0.007$ ) but were not associated with sex, age, VAS pain score immediately before surgery, or RCT size (Table 2).



**Fig. 2.** Medical institutions visited (except orthopedic clinic) prior to receiving arthroscopic rotator cuff repair.

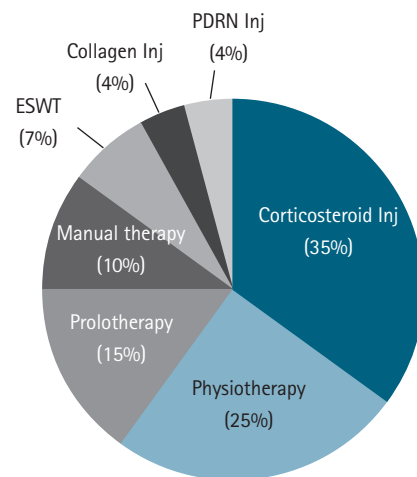


**Fig. 3.** Treatments from oriental medical clinics. Choona: chiropractic.

## DISCUSSION

This comprehensive multi-center study provided an in-depth exploration into the preoperative health care experiences of patients with RCTs in Korea before undergoing ARCR. The analysis showed striking patterns of healthcare-seeking behaviors and associated financial burdens that emphasize the complexities patients navigate before receiving definitive surgical intervention.

In the present study, 87% of individuals sought care from multiple healthcare providers before their eventual surgery. This prevalent practice of doctor shopping represents the search for satisfactory diagnosis and treatment options. On average, patients visited approximately 9.4 medical institutions, highlighting the persistent nature of their discomfort and underscoring the fragmented approach in the healthcare system to managing such conditions. Nearly half of the study participants sought opinions from more than two medical institutions, further emphasizing



**Fig. 4.** Treatments from pain clinics. ESWT: extracorporeal shock wave therapy, Inj: injection, PDRN: polydeoxyribonucleotide.

**Table 2.** Multiple regression analysis showing the associations between total expenditure prior to ARCR and variables

Variable	Non-standardized coefficient $\beta$	Standard error	P-value
Total number of medical institutions visited before undergoing surgery	126,015.383	40,449.189	0.002
Symptom duration	4,638.232	1,504.746	0.002
VAS pain score at first hospital visit	57,812.391	21,361.661	0.007
Preoperative VAS pain score	-	-	0.490
Sex	-	-	0.168
Age	-	-	0.055
RCT size			
Anteroposterior	-	-	0.579
Mediolateral	-	-	0.267

ARCR: arthroscopic rotator cuff repair, VAS: visual analog scale, RCT: rotator cuff tear.

the widespread uncertainty and inconsistency in the initial management of RCTs.

Malik et al. [11] reported approximately \$900 to \$1,300 per patient in the United States in rotator cuff-related health care resource use in the year prior to undergoing ARCR. The authors suggested that judicious use of nonoperative treatment modalities among patients who would not benefit from nonoperative care would be an effective method of reducing cost. In the present study, the average medical expenditure was 641,983 KRW (\$466) per patient, ranging from 50,000–5,000,000 KRW, demonstrating the economic strain on individuals. The analysis revealed direct correlations among the number of healthcare visits, the duration of symptoms, and the initial pain severity with escalating costs. Notably, these costs appeared independent of demographic factors such as sex or age as well as clinical parameters including the immediate pre-surgical VAS pain score and the physical dimensions of the RCT. This suggests that the drivers of healthcare costs in this context are more closely associated with healthcare-seeking behavior and chronicity of symptoms than demographic or specific clinical characteristics of the patients.

The observed pattern of extensive doctor shopping and the subsequent financial implications underscore a pressing need for a more streamlined, efficient, and coordinated approach to managing RCT [19,20]. The propensity of patients to consult multiple healthcare providers before receiving surgery indicates possible deficiencies in the initial care received [21], which may include inconsistent diagnoses, varied treatment recommendations, or general dissatisfaction with the care provided [22].

Addressing the issue of doctor shopping is about reducing the number of consultations or limiting patient autonomy as well as enhancing the quality and consistency of initial evaluations, ensuring patients receive accurate information and appropriate guidance from the outset. This would streamline the patient course to surgery and potentially alleviate the considerable financial burden observed [23].

Delayed diagnosis and improper treatment of RCTs can lead to functional impairment and poor prognosis of the patients [24,25]. Delays in repair of a symptomatic tear can lead to higher retear rates and may necessitate more complex surgical procedures [26,27]. Therefore, timely appropriate intervention is critical in managing symptomatic RCTs [28,29].

The present study had several limitations. The reliance on historical data might introduce biases and limit control over confounding variables due to the retrospective nature of the research. For example, variables such as cost, number of visits, and treatment modalities from other hospitals mainly relied on patient memory and are vulnerable to recall bias. The findings may not

be applicable to other settings or populations due to differences in geographic location, healthcare systems, or demographics of the study population. Without long-term follow-up, the study might miss crucial outcomes, failing to capture the full effect of preoperative interventions on the outcome. Furthermore, differences in how healthcare providers approach RCT diagnosis and management can introduce variability that complicates the standardization and interpretation of preoperative care. In addition, evaluation of patient socioeconomic status, imaging modalities, costs for radiographic evaluation at other hospitals, and analysis of differences between urban and rural areas was not performed. Last, the absence of a comparison group complicates direct attribution of outcomes to the preoperative interventions studied. Consequently, we could not determine the factors associated with patients who engaged in more frequent doctor shopping. In addition, although individuals with health concerns are expected to perform more numerous visits, we could not evaluate this issue.

## CONCLUSIONS

This study showed the trend in doctor shopping of RCT patients in Korea. The patients visited multiple institutions, underwent various nonoperative treatments, and spent a large amount of money before receiving ARCR. Patients should consider visiting as early as possible a hospital that has surgeons who specialize in shoulder repair to prevent unnecessary medical expense and receive proper treatment.

## NOTES

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### Conflict of interest

None.

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None.

### Data availability

Contact the corresponding author for data availability.

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