



National Trends of Hip Arthroscopy in Korea

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Hip arthroscopy has been reported to be useful and promising for the treatment of hip pathologies. However, it is not known whether the utilization of hip arthroscopy has increased in Korea. The purpose of this study was to evaluate national trends regarding the utilization of hip arthroscopy in Korea. We retrospectively reviewed nationwide data obtained from the Health Insurance Review and Assessment Service (HIRA). All new admissions for hip arthroscopy are recorded nationwide by HIRA using the ICD-10 code and the code for arthroscopic devices. Using archived data, we determined the trends in utilization of hip arthroscopy between 2007 and 2010. The number of hip arthroscopies increased more than twofold over the study period, from 596 to 1,262. A third of cases were performed in hospitals. Furthermore, a bimodal distribution was observed for men (20 to 24 yr and 45 to 49 yr) and an unimodal distribution for women (50 to 54 yr). Our results show an increasing trends in the utilization of hip arthroscopy from 2007 to 2010, which is in-line with recent findings of increased utilization with the rest of the world.

Keywords: Hip Arthroscopy; Trends; Epidemiology

INTRODUCTION

Hip arthroscopy has been reported to be a useful and promising treatment of intra/extra-articular pathologies of the hip (1-8). However, the majority of these studies were performed in the West (1-6), where hip arthroscopy has been increasingly used during the last decade (9, 10).

Although hip arthroscopy has been used worldwide, few studies on the subject have been published in East Asia, presumably because of its recent introduction and the smaller number of surgeons. Furthermore, no study has yet been reported regarding the utilization of hip arthroscopy in Korea. However, our hypothesis is that the trends of hip arthroscopy utilization increase also in Korea.

Therefore, the purpose of this study was to evaluate trends in hip arthroscopy utilization in Korea, using nationwide data obtained from the Health Insurance Review and Assessment Service (HIRA).

MATERIALS AND METHODS

We analyzed data from the nationwide claims database, which contains details of medical and pharmacy claims for the Korean population, of the HIRA of Korea between the years 2007 and 2010. In Korea, 97.0% of the population is legally obliged to enroll in the Korean National Health Insurance Program. Patients pay on average 30% of the total medical costs to clinics or hospitals that manage almost all diseases, except for conditions

not covered by insurance, such as, cosmetic surgery or some unproven therapies. All clinics and hospitals then submit claims data for inpatient and outpatient management, including diagnoses (classified according to the International Classification of Diseases, 10th revision [ICD-10]), procedures, prescription records, demographic information, and direct medical costs, to HIRA to obtain 70% reimbursement of the total medical cost from the Korean Government. Of the remaining 3% of the population, not insured by the Korean National Health Insurance Program, most are covered by a Medical Aid Program; the remainders are temporary or illegal residents. The claims data covered by the Medical Aid program are also reviewed by HIRA. Therefore, virtually all medical information about patients is available from the Korean HIRA database, which has been used on several occasions for epidemiological studies (11-14).

All new admissions to Korean hospitals for hip arthroscopy are recorded prospectively in nationwide cohort by the above-described system using ICD-10 codes and procedures. To identify hip arthroscopy, selected ICD-10 codes for hip pathologies (S7xxx and Mxxx5) and a device code (N0031003) for arthroscopy were used. The HIRA database includes three groups of hospitals classified by bed size (clinics; < 30 beds, hospitals; ≥ 30 to < 100 beds, general; ≥ 100 beds, and tertiary hospitals; ≥ 300 beds). Retrieved data were retrospectively evaluated to determine trends in hip arthroscopy utilization in men and women between the years 2007 and 2010. De-identified data was available in this study, because the HIRA limited the database for the public.



Fig. 1. Total numbers (A) and age-adjusted rates (per 100,000 persons) (B) of hip arthroscopy for men and women.

Table 1. Annual percentage change (95% confidence interval) in age-adjusted and gender-specific rate of hip arthroscopy from 2007 to 2010

	Annual percentage change	95 % confidence interval
Men	22.6*	10.3-49.8
Women	29.5*	18.6-41.4
Total	26.1*	14.0-39.4

* $P < 0.05$.

Statistical analysis

To determine trends in hip arthroscopy utilization, patients were divided into 5-yr age groups and dichotomized by gender. Annual Percentage Changes were calculated to determine whether utilization changed from 2007 to 2010 using joinpoint regression analysis (Joinpoint Regression Program, Version 3.5.2, Statistical Research and Applications Branch, National Cancer Institute, Bethesda, USA). Age-adjusted and gender-specific rates were used in the analysis. Numbers of men and women were obtained from the 'Statistics Korea' web site (<http://www.kosis.kr>), the official web site of the Central Government Organization for Statistics (15). Statistical significance was accepted for P values of < 0.05 .

Ethics statement

The study protocol was reviewed by the HIRA institutional review board (IRB No. X-1204-149-906), and informed consent was exempted because this study used only data opened to the public.

RESULTS

During the study periods, 3,705 hip arthroscopies were performed in Korea. The male-to-female ratio of patients undergoing hip arthroscopy was 1.08. Between 2007 and 2010, the absolute number of hip arthroscopy increased from 596 to 1,262, and the age-adjusted rate of hip arthroscopy also more than doubled from 2.57 per 100,000 persons to 5.17 per 100,000 persons (Fig. 1). The age-adjusted rates of hip arthroscopy for men and wo-

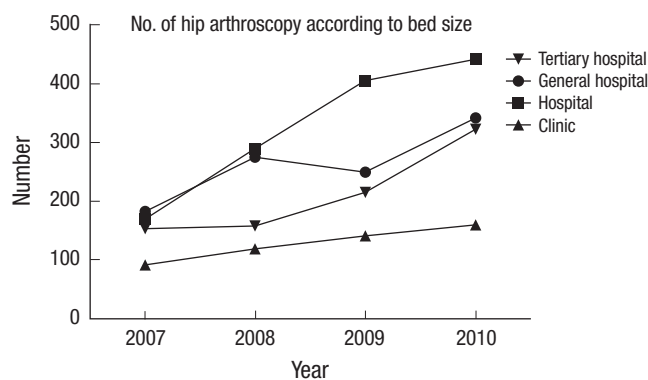


Fig. 2. Total numbers of hip arthroscopy by each institute.

men significantly increased 22.6% and 29.5% per year during the study period, respectively (Table 1). When stratified by bed size, one third of hip arthroscopies were performed in hospitals, but the numbers of hip arthroscopies performed increased in all types of institutes (Fig. 2). When stratified by age, the numbers of hip arthroscopies performed showed a bimodal distribution for men (20 to 24 yr and 45 to 49 yr) and an unimodal distribution for women (50 to 54 yr) (Fig. 3).

DISCUSSION

Hip arthroscopy is a useful procedure for treating pathologies around the hip. The present study shows a significant increase in the number of hip arthroscopies performed in both genders from 2007 to 2010. Interestingly, the distribution by age differed for men and women, and although we could not determine indications for hip arthroscopy at the individual level, it would appear that hip arthroscopy in young men has different surgical goals and indications than hip arthroscopy in older men or in women.

Hip arthroscopy was initially described in 1931 by Burman (16), who noted that "it is impossible to separate the head of the femur and the acetabulum." Although hip arthroscopy was in-

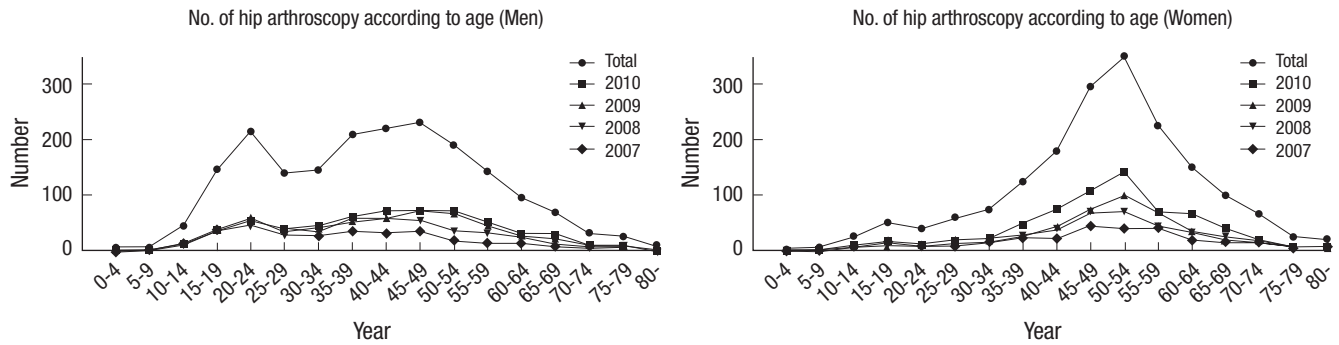


Fig. 3. Age-specific numbers of hip arthroscopy for men and women.

troduced early, the development of hip arthroscopy has been relatively delayed due to steep learning curves, deeply located surgical field, and the confined working space (17-19).

With advances in instruments for safe and good visualization of the joint since the late 1970s, hip arthroscopy has reappeared in the West. Since then, advances in arthroscopic technique and arthroscopic instrumentation, such as the curved, extended-length instrument, have facilitated the arthroscopic procedure. Improvements of clinical outcome following hip arthroscopy in literature have extended the indications for hip arthroscopy during the past several years (1, 7, 8, 20, 21). Currently, indications for hip arthroscopy include the treatment of extra-articular lesions (bursitis, snapping iliopsoas tendon or iliotibial band, and gluteus medius tendon tear) as well as intra-articular lesions (femoroacetabular impingement, labral tear, chondral lesion, septic arthritis, femoral head fracture, synovial chondromatosis, and loose or foreign body) (1, 7, 8, 20, 21).

The increased utilization of hip arthroscopy in Korea falls in line with recent reports that support the use of hip arthroscopy for the treatment of hip pathologies (1-8). Furthermore, this finding concurs with the results of a recent survey conducted in the USA (9), which demonstrated that the utilization of hip arthroscopy increased eighteenfold over the last decade (9).

There are several possible reasons for increasing the utilization of hip arthroscopy in Korea. First, the ability to diagnose intra-articular pathology, such as labral tear, has been increased by the use of magnetic resonance arthrography. Second, educational training programs might explain our findings, because hip arthroscopy has a steep learning curve, as pointed out in the previous study (9, 18, 22). In Korea, cadaver workshops and academic congresses have been held annually on the topic since 2004. Third, the numbers of patients who met the indication of hip arthroscopy might be large. A majority of the Korean population have a lifestyle of sitting on the floor cross-legged or kneeling, resulting in the impingement between the femoral head-neck junction and acetabulum. Femoroacetabular impingement has been known as one of the most common indications of hip arthroscopy in the West (3, 4, 7, 20). Fourth, the overuse of hip arthroscopy is possible. Hip arthroscopy could be electively per-

formed in patients who had less medical problems, unlike a hip fracture surgery, which comprise a majority of hip surgeries in Korea. Further, patients might easily have less reluctance to arthroscopy than open surgical procedures, because arthroscopy has less skin incision, short hospitalization and surgery-related morbidities (5).

In terms of bed size, hospitals occupied one third of the total number of hip arthroscopies in Korea, instead of teaching hospitals such as tertiary or general hospitals. There is a possibility that many procedures were being performed by not-qualified surgeons, considering the steep curve of learning hip arthroscopy and the short history in Korea (17-19, 22).

Compared to the United States, where the greatest incidence of hip arthroscopy was observed in patients aged 20 to 39 yr (10), the age group with the greatest incidence of hip arthroscopy was relatively older in Korea. Furthermore, the incidence of hip arthroscopy showed a bimodal distribution in Korean males. We do not know the exact reason of the different demographic distribution, and there could be several explanations for these findings. First, the background of surgeons who performed hip arthroscopy might be associated with these findings. Orthopedic surgeons with a specialty in joint reconstruction have introduced hip arthroscopy in Korea, while orthopedic surgeons with a specialty in sports medicine, such as knee and shoulder surgery, have performed hip arthroscopy in the United States. Second, indications for hip arthroscopy might be different according to gender, although indications for hip arthroscopy at the individual level were not available in this study.

Although the present study has the benefits of a large sample size from a nationwide database, it also has some limitations than warrant consideration. First, as mentioned above, indications for hip arthroscopy at the individual level were not available, because the study was based on National Claim Registry data. Second, the study was conducted over only 4 yr, because HIRA limited the study period. Third, we could not exclude duplications, because only de-identified data could be used in this study.

This study shows increasing trends in the utilization of hip arthroscopy in Korea from 2007 to 2010. One third of the cases

were performed in hospitals. Utilization of hip arthroscopy indicated a bimodal distribution in men (20 to 24 yr and 45 to 49 yr), and an unimodal distribution in women (50 to 54 yr).

DISCLOSURE

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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