Journal of Hand, Upper Limb, and Microsurgery
JHUM
Indonesian Orthopaedic Association for Upper Limb and Reconstructive Microsurgery

Demographic Profile of Chronic Glenohumeral Joint Dislocation Patients in Indonesian Tertiary Orthopaedic Hospital

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ABSTRACT

Introduction: Chronic dislocation of shoulder defined as a loss of recognition of shoulder injury for several days. The main etiology of this injury was trauma, alcoholism, or seizures. Chronic dislocation of shoulder caused many pathological changes in the bony and soft tissue.

Methods: This is a retrospective study that was conducted by the authors in 2019-2021. The data were collected from electronic medical record, which included demographic information, duration of dislocation to treatment, complications using DASH questionnaire and visual analog scale score.

Results: There were 30 patients of all, which males 19 (63,3%) were more than females 11 (36,7%) with the peak male distribution was age group 40-49 and >60 years and the peak female distribution was age >60 years. Anterior dislocation was the most common type (n=28, 93,3%) followed by posterior dislocation (n=1, 3,3%) and inferior dislocation (n=1, 3,3%). The right side of the shoulder was more frequently affected (n=23, 76,7%). Concomitant fractures were found in the isolated shoulder dislocation group (n= 19, 63,3%) and in the fracture dislocation group (n=11, 36,7%). DASH highest and lowest score was 69,2 and 0 with average of 18,7. VAS highest and lowest score was 2 and 0 with average of 0,23.

Discussion: The glenohumeral joint was commonly dislocated (60%–98% of traumatic glenohumeral dislocations being anterior). The highest incidence was found in the age group >60 years, with the most dislocated side being anterior (93.3%) and the dominant side was more frequently affected. Chronic shoulder dislocation was recorded more in men than women in literature whereas no provided explanation for the sex-related incidence differences. Greater Tuberosity (GT) fractures were the most frequent complications of anterior dislocations although in our study, fracture dislocations were found in 11 (36.7%) patients. Open reduction Improves the clinical outcome, pain, and function with a DASH score of <30, showed the disorder does not cause daily living problems.

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Keywords: ***Demography; Chronic Unreduced Dislocation; Shoulder Joint, Indonesian People***

Introduction

In most cases, anterior shoulder dislocations are not misdiagnosed since they present with limb abduction and external rotation. It is not uncommon for such cases to be late when they are treated by unqualified practitioners in rural areas.1 A chronic dislocation of shoulder is defined by Rouhani and Navali2 as a condition in which there is a loss of recognition of the injury for several days, although other literature indicates that it can last for 3-4 weeks.3,4 Other literature defined chronic dislocation as one which is one or more weeks old in an unreduced position.5 An untreated shoulder dislocation presents with severe impairment of shoulder function and requires extensive procedures to obtain desired outcome. In addition, chronic dislocations cause many pathological changes in the bony and soft tissue architecture of the shoulder joint.[3]

From all the joints in the human body, shoulder joint is the most frequently dislocated joint accounting for almost 45%. Anterior dislocation of the shoulder joint is the most common type of shoulder dislocation, accounting for 60%–98% of all shoulder dislocations1–3,6–9 among all shoulder dislocations, mainly caused by trauma, alcoholism or seizures. In contrast, chronic dislocation of the shoulder occurs in the elderly due to aging, weakness, and degeneration of the soft tissues surrounding the shoulder.3,4,10 Due to the position of the extremity in adduction and internal rotation, posterior shoulder joint dislocations are most commonly overlooked. They are usually caused by indirect trauma like violent muscle contractions during epileptic attacks or electric shocks.[1,3]

Younger patients who suffer from a shoulder dislocation usually display the Bankart lesion, which is a typical capsulolabral injury. The fundamental approach to treating this injury is to restore the anatomy.11–14 Nevertheless, older patients are more likely to suffer further damage like nerve damage, rotator cuff tear and greater tuberosity fracture. It appears that elderly individuals demonstrate distinct pathophysiology than their younger counterparts, as reported in some studies.14,15 Despite studies reporting that chronic anterior shoulder dislocations do not impair shoulder function, the majority of patients experience problems and cannot return to normal activities.[4]

The Disability of Arm, Shoulder, and Hand Questionnaire (DASH) is a standardized questionnaire that evaluates impairments and activity limitations, as well as participation restrictions in leisure and work activities. Each module of the DASH receives a score between 0 and 100, with a high DASH score indicating severe disability.[16]

Material and Methods

From 2019 to 2021, we collected data from patients at the Prof. Dr. Soeharso Orthopedic Hospital, Surakarta, Indonesia who suffered chronic anterior shoulder dislocation and underwent open reduction surgery and temporary shoulder fixation. The inclusion criteria were (i) chronic anterior shoulder dislocation or fracture dislocation (more than 3 weeks); (ii) underwent open reduction with/without temporary fixation of the glenohumeral joint. The exclusion criteria included: (i) congenital anterior shoulder dislocation; (ii) recurrent anterior shoulder dislocation; and (iii) dislocation with concomitant neurologic injury.

Surgery was performed using deltopectoral approach and joint fixation has been suggested for most chronic anterior dislocation of shoulder. Temporary arthrodesis by using Steinmann pin fixation have been used to prevent redislocation, and maintained for three or four weeks in Velpeau bandaging.

In this retrospective study, the following data were analyzed from the institutional database:

age and sex of the patients, direction and side of dislocation, fracture involvement and clinical outcome using the DASH questionnaire and VAS score. DASH score and VAS was assessed when the patients visited the outpatient clinic following the pin removal and encourage the patient to start mobilization the affected shoulder.

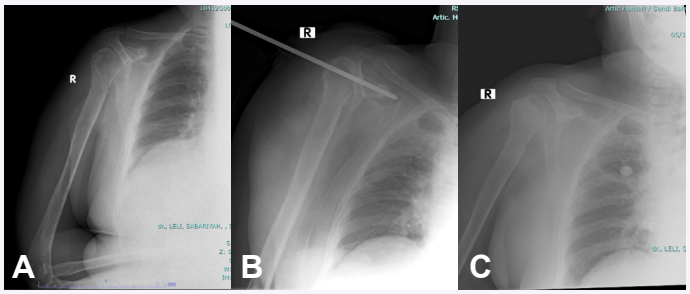

Figure 1. Imaging of gleno-humeral joint before the surgery (A), post op (B), three months after surgery (C).

Result

The collected medical records that met the inclusion criteria were 30 medical records. Patient profiles were classified by gender and age (diagram 1), direction of dislocation, side of shoulder fracture involvement. We also evaluate the clinical outcome using DASH Questionnaire and VAS Score. The results are shown in table 1. No association of neurovascular injury in chronic dislocations was reported of all patients in this study.

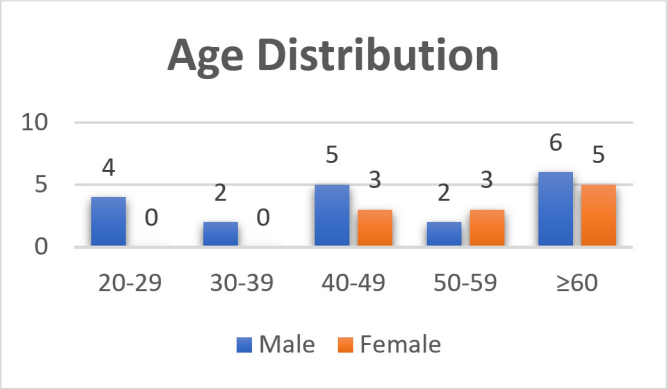

Diagram 1. Bar chart of the gender and age distribution.

Among the patients at the Orthopedic Hospital Prof. Dr. R Soeharso, those aged over 60 years represented 36.7% (n = 11), which was divided into male and female, 6 and 5 patients respectively. Followed by those aged 40-49 years as many as 8 patients (22.9%) with a total of 5 males and 3 females. Next were 5 (16.7%) patients in the 50-59 years age group which were divided into 2 male patients and 3 female patients. There were 4 patients (13.3%) in the 20-29 year age group and 2 patients (6.7%) in the 30-39 year age group who were all male. Furthermore, there were more male than females, accounted for 19 (63.3%) compared to 11 (36.7%) with the peak male distribution in the age group 40-49 and >60 years. While the distribution in the female group has a peak at age> 60 years.

Table 1. Patients Characteristic

Characteristic	n	%
Direction		
Anterior	28	93.3%
Posterior	1	3.3%
Inferior	1	3.3%
Side		
Right Shoulder	23	76.7%
Left Shoulder	7	23.3%
Fracture Involvement		
Isolated	19	63.3%
Fracture dislocation	11	36.7%
greater tubercle	6	54.55%
neck humerus	4	36.36%
lesser tubercle	1	9.09%
DASH Score		
Maximum	69.2	
Minimum	0	
Average	18.7	
VAS Score		
Maximum	2	
Minimum	0	
Average	0.23	

Based on the direction of shoulder dislocation, the author categorizes groups of patients into anterior, inferior, and posterior dislocations in the patient data. The highest number of patients found was in the anterior dislocation group. A total of 28 patients, or 93.3%, were found in this group of patients. Whereas in the other two groups, inferior and posterior dislocation, 1 patient was recorded each (3.3%).

In the category of the affected shoulder, the right side was found more than the left side. The patients with the right shoulder group counted 23 patients (76.7%) compared to the left side, 7 patients (23.3%). Of all the patients who had fracture dislocations, 6 of them had

fractures at the greater tubercle, 4 were neck humerus, and the rests was lesser tubercle.

In dislocated shoulder joints, fracture involvement is often found which can affect patient outcomes. The author also divides into 2 categories, the presence or absence of concomitant fractures. In the isolated shoulder dislocation group, 19 patients (63.3%) were found. Meanwhile, in the fracture dislocation group, 11 patients (36.7%) were found.

The author also investigated the clinical outcome in this case using the DASH Score and VAS Score. From the data obtained, the average DASH score for all patients was 18.7 with a maximum score of 69.2 and a minimum score of 0. Meanwhile, the VAS Score data recorded an average of 0.23 with a maximum score of 2 and a minimum score of 0.

Figure 2. Acceptable range of motion of shoulder abduction and shoulder elevation following three months surgery.

Discussion

One of the most commonly dislocated joints in the human body is the glenohumeral joint with 60%–98% of traumatic glenohumeral dislocations being anterior. In general, anterior shoulder dislocation shows a bimodal age distribution due to the glenohumeral joint of the shoulder. Violent external rotation in abduction levers the head of the humerus out of the glenoid socket, avulsing anterior bony and soft tissue structures. The final part of the humeral head often collides with the anterior rim of the glenoid, creating a bony indentation at the back of the humeral head (the Hill Sachs lesion).[1,2,8,9,17] According to several literatures[8,10,18,19,] in the United States has been estimated to be between 17 and 26.9 per 100,000 person-years. Meanwhile, there are no studies yet that report the incidence rate in Indonesia.

Young adult men who have sustained high-energy shoulder injuries are the largest group. In the second group, older patients who have been injured with much less violence are involved.[3,14,17,20,21] In our study, the highest incidence was found in the age group >60 years. Dislocation data from our study show that most of them are anterior dislocations, accounting for 93.3%. The rest are inferior and posterior dislocations, each accounting for 3.3% of all dislocations. This is in accordance with some of the literature mentioned. The right side of the shoulder was more frequently affected than the left side, with 23 cases recorded compared to 7. Dai, et al8 reported dislocations occur 18 left sides and 25 right sides, involving 19 dominant sides.

A series of epidemiological studies conducted in North America and Scandinavia from 2002 to 2010, encompassing anywhere from 200 to 20,000 patients, found that men accounted for 72% to 82% of patients sustaining shoulder dislocations.[22] The data we found showed agreement with the several literatures mentioned where in this study, men were recorded more than women, 63.3% compared to 36.7%. According to other literature18, the incidence of first-time post traumatic shoulder dislocation in Poland in the years 2010 and 2011 were 38.8 among males and 18.3 among females. The differences in activity contribute to differences in the age at which dislocation is more prevalent between the 2 sexes. Among younger patients, the risk of recurrence correlates strongly with the severity of the initial injury and the age of the patient at presentation, with the 16–30 year-old group at the highest risk.20 The peak in numbers for men is spread over those aged 17–22 years,

and a peak was observed in women aged 61–70 years. However, the data we found is in accordance with research conducted by Krøner et al23 which also found that the mean age range for patients who sustained shoulder dislocation was 21 to 30 years for male patients and 61 to 80 years for female patients. In the female group, the peak incidence is in the age group >60 years. Although the majority of studies have shown that men may be more susceptible to shoulder instability than women, none have provided an explanation for this sex-related difference. When investigating sex-comparable sports such as swimming, tennis, basketball and track events, the rates of shoulder instability injury tend to be similar for men and women.[22]

Corresponding to different injury mechanisms, after a primary shoulder dislocation, a variety of bone injuries may occur, such as proximal humeral fractures, greater tuberosity (GT) fractures, coracoid fractures, and glenoid fractures. Glenoid fractures are the most frequent complications of anterior dislocations of the shoulder, with incidence rates ranging from 5% to 75%.[8] In approximately 15%-35% of patients presenting with anterior shoulder dislocation, a concomitant fracture of the greater tuberosity (GT) is observed.[8,19] In our study, fracture dislocations were found in 11 (36.7%) patients.

Some studies showed that open reduction for chronic shoulder joint dislocation can improve the clinical outcome of the patients, including pain and function. [4,5,24] The functional outcome in our study was determined using the Disability of Arm, Shoulder, and Hand Questionnaire (DASH) score. A DASH score of <30 is considered as the point where the disorder does not cause daily living problems. In our study, although there is a patient with DASH score 69,2, but the average DASH score of all patients was 18,7 showing that most patients doesn't have problems in their daily living after treatment.[25]

Current pain intensity was measured using a 10-part VAS ranging from 0 to 10. One of the variables indicating successful treatment in chronic shoulder joint dislocation is pain relief.26 The pain intensity after treatment in our study was low, shown by average VAS score of patients was 0,23. This data accordance with study conducted by Rouhani and Navali2 (2010) that shown all patients with chronic anterior shoulder dislocation that underwent open reduction with simultaneous Bankart lesion were able to do their daily activities with mild or no pain.

DECLARATIONS

Conflict of interest: None declared

Ethics Approval and Consent to Participate: This research had already been approved by ethical committee in Dr. Soeharso Orthopedic Hospital. The privacy and personal identity information of all participants were protected and written informed consent was obtained from all participants.

Competing Interest: The authors declare that they have no competing interest

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgement: None

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