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Demographic, epidemiological and clinical characteristics of traumatic shoulder dislocations in Turkey: a retrospective single-center urban-rural study

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Abstract

Aim: The aim of our study is to investigate the literature data comparing with demographic and clinical characteristics of shoulder dislocations in Mus city of Turkey.

Methods: The patients who applied to our hospital with shoulder dislocation between January 2017 and December 2018 were examined retrospectively. The data of a total of 306 patients were obtained from the database. 125 patients which have no radiological imaging of shoulder dislocation were excluded from the study. Incidence, demographic characteristics, type of dislocation, presence of additional injuries, etiology of dislocation, recurrent dislocation, length of hospital stay and reduction of dislocation were evaluated.

Results: A total of 181 patients, including 140 (77.34%) male and 41 (22.65%) female, ages ranging from 12 to 93 (mean 39.98 age) were included in the study. During the study year, the incidence of primary shoulder dislocation was 18.9/100,000 per year (14.4/100,000 for men and 4.4/100,000 for women). 153 of the patients (84.5%) had only one and 28 (15.4%) patients had at least two times history of shoulder dislocation. 172 of the patients' shoulder were closed reduced under sedation in the emergency department and nine of them were closed reduced in the operating room under general anesthesia.

Conclusion: The incidence of the study is 18.9/100.000 and similar to the previous studies in the literature. This result may be explained by the regional demographic diversity of the patient population.

Keywords: Shoulder dislocation; incidence; demographic characteristics; traumatic shoulder dislocation; recurrent dislocation

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1. Introduction

Shoulder dislocations and related instabilities are common cause of chronic shoulder pain and restriction. Shoulder is the largest joint with the highest rate of dislocation. The most common type is anterior dislocation. Less frequently, posterior and inferior dislocations occur respectively. A failure to reduce a shoulder dislocation within 24 hours, the possibility of a stable closed reduction decreases rapidly [1]. It has been reported that the incidence of shoulder dislocation in the population varies between 11.2-23.9 per 100,000 people annually [2,3]. There is a limited number of shoulder dislocation studies in the literature on Turkish population. Although there are many studies on this subject in the world, most of them are European and American studies.

We think that the demographic and epidemiological characteristics of shoulder dislocations in the literature differ both in the Turkish population and in the region due to socio-cultural characteristics, behavioral changes in sports activities and lifestyle differences. In this retrospective study, we discussed demographic and clinical characteristics of shoulder dislocation in a city located in Eastern Anatolia in Turkey in the light of existing literature data.

1. Material And Methods

Mus is located in the Eastern Anatolia of Turkey, with the economy based on agriculture and according to the data of 2017, the population was 404.544. The demographic data of Mus was obtained from the Turkish Statistical Institute [4] (Figure 1). There is only one general hospital in the city center which all traumatic cases are admitted. Local ethics committee approval was obtained and all conditions of the Declaration of Helsinki were complied with during the study.

Patient data from January 2017 to December 2018 were reviewed retrospectively. The data of 306 patients were obtained from the database with the diagnosis in the ICD-10 classification system including M24.3 (Pathological dislocation and subluxation of joints, not elsewhere classified), M24.4 (Recurrent dislocation and subluxation of joint), S43.0 (Dislocation of shoulder joint), S43.3 (Dislocation of other and unspecified parts of shoulder girdle) and S43.4 (Sprain and strain of shoulder joint). The radiological images enrolled in the PACS system (Picture Archiving and Communication System) and epicrisis information of the patients were analyzed. 125 patients with no evidence of shoulder dislocation on X-

ray graphy were excluded from the study. Of the 181 patients included in the study; demographic characteristics, length of hospital stay, type of dislocation, presence of additional injury, etiology of dislocation, presenceof recurrent dislocation and whether the dislocation was reduced in the emergency department or operating room were evaluated. The data of the patients with suspicious information in their records were confirmed by contacting them. Patients' radiographic images and epicrisis information were evaluated by only one orthopaedic surgeon. The patients were evaluated by grouping them as younger than 20 years old, over 80 years old and between 20 and 80 years of age.

Statistical analysis was performed using SPSS software (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). The compliance of numerical variables to normal distribution was achieved using visual (histogram and probability graphics) and analytical methods (Kolmogorov-Smirnov/ShapiroWilk tests). Descriptive statistics for numerical variables with normal distribution are given with mean and standard deviation, while descriptive statistics for numerical variables that do not show normal distribution are given with median and interquartile values. Descriptive statistics of categorical variables were given using numbers and percentage values. The Mann-Whitney U test was used to compare two groups with at least one abnormal distribution. Chi-square or Fisher test were used according to the expected minimum value and the expected value in comparison of two categorical independent groups. The Kruskal-Wallis test was used to compare three groups, at least one of which was not normally distributed. Statistical significance level was accepted as $p<0,05$.

140 (77.34%) of the patients were male and 41 (22.65%) were female. The male/female ratio was 3.4/1. The median age of women was 66 years (25.5) and the median age of men was 28 years (20.75) ($p<0.001$). The mean age of all patients was 39.98±20.41 years (12-93 years). There were 24 patients (13.25%) between 0 and 20 years old, 150 patients (82,89%) between 21 and 80 years old and 7 patients (3.86%) over 80 years old. Two peaks were seen between the ages of 21-30 and 61-70 (Table 1, Figure 2).

While 153 of the patients (84.5%) had a history of only one dislocation and 28 (15.46%) had at least two dislocations (Figure 3). Of the patients with primary shoulder dislocation, 117 were male and 36 were female and the mean age was 35

years old. Of the patients with recurrent shoulder dislocation, 23 were men and 5 were women and the mean age was 25 (p=0.004). The distribution of men and women in primary and recurrent dislocations was similar (p>0.05) (Table 1). 177 of the patients had an anterior (97.77%), three had a posterior (1.65%) (Figure 4) and one had an inferior dislocation (0.55%) (Figure 5). Of these dislocations, 95 (52.5%) were right shoulder, 85 (47%) were left shoulder and one (0.5%) was bilateral. There was no significant difference in the incidence of dislocation in the right and left sites (p>0.05). Considering the months when patients were hospitalized and grouped according to the seasons, 51 patients were admitted in spring, 51 patients were admitted in summer, 41 patients were admitted in autumn and 38 patients were admitted in winter (Figure 6). There was no statistically significant difference between the seasons (p>0.05). Considering the history of dislocation, 16 (8.83%) were occurred after traffic accidents, 91 (50.27%) were occurred as a result of falling, 59 (32.59%) were occurred after trauma, nine were occurred after sports injuries (4.97%) and six (3.31%) were occurred after epilepsy or an electric shock. There was no statically significant difference between age-related injury mechanisms (p>0.05). Although there is no statistically significant difference, it can be thought that shoulder dislocations due to falls and trauma are more common in the 21-30 age group (Table 2).

156 of the patients presented with isolated shoulder dislocation. In addition to shoulder dislocation, three patients had a proximal humerus fracture, 18 had a tuberculum majus fracture (Figure 7), one had a scapula fracture, one had a clavicle fracture, one had an acromion fracture and one had a coracoid fracture. The mean age of patients with isolated shoulder dislocation was found to be younger (p<0.05).

172 of the patients were reduced under sedation in the emergency department and nine were under general anesthesia in the operating room. 152 patients who were closed reduced in the emergency department were discharged with a shoulder arm sling or velpeau bandage. 29 patients were followed up in the hospital for an average of 3 days due to additional health problems. There was no significant correlation between the number of dislocations and the location of reduction (p>0.05).

At the time the of study, the incidence of primary shoulder dislocation was 18.9/100,000 per year (14.4/100,000 per year in men, 4.4/100,000 per year in

women), the total incidence of shoulder dislocation was 22.4/100,000 per year (17.3/100,000 in men, 5.1/100,000 in women).

2. Discussion

The aim of our study is to determine the demographic and clinical characteristics of shoulder dislocations in a city that is located in Eastern Anatolia of Turkey. After reviewing the literature on the incidence and demographic characteristics of shoulder dislocations, we found that there is only one academic research conducted on the Turkish population [5]. Considering the studies in the literature, the majority of these are studies conducted on American and European societies.

In the study in which 124 patients were included between 1970 and 1979 in the United States, the incidence of shoulder dislocation was found to be 11.2/100,000 person-years [2]. In another study conducted by Zacchilli et al. in the USA, a total of 8940 shoulder dislocations were included in the study using the data from 2002 to 2006 and the incidence of shoulder dislocation was 23.9/100,000 person-years; Szyluk et al. reported shoulder dislocation incidence as 26.69/100,000 person-years between 2010 and 2015; in a study by Kroner et al. in Denmark, the incidence of shoulder dislocation between 1980-1984 was 17/100,000 person-years; in a Norwegian study, the incidence of shoulder dislocation between 2009 and 2010 was 56.3/100,000 person-years; the incidence of shoulder dislocation in a study conducted between 2008-2010 in Turkey was 6.4/100,000 person-years; and the incidence of shoulder dislocation in our study, was 18.9/100,000 person-years [3,5,6,7,8]. According to the results of our study, we think that the incidence of shoulder dislocation is actually higher. We think that some of the patients who did not apply to our hospital, they were applied to near province hospitals and some of them were treated by bonesetters. Adverse weather conditions and economic difficulties in rural areas, especially in winter, prevent people from accessing health services. Therefore, we explain the low rate of patients in winter with the the presence of patients who could not reach the hospital. In addition, the incidence differences observed in the literature and in our study are also affected by the the population distribution by age group of the society where the study was conducted. The bimodal distribution curve in the literature is also present in our study (9). Hovelius et al. reported in Sweden that shoulder dislocation is increased from 1.7% to 8% among

ice hockey players [10,11]. In our study, the wide distribution of young active population within the total population of the region increases the number of patients who form the first peak in the bimodal age distribution of shoulder dislocation. Furthermore, considering the socioeconomic status of the region, we think that this high ratio is because of young male population who works in agriculture and animal husbandry that require physical activity and prone to accidents. Similarly, in accordance with the literature, the incidence of shoulder dislocation was higher in men than in women in our study, but there was no distinction between the existing data and rural and urban distribution [2]. The male / female ratio was found to be 3.4 and was slightly higher, although it is consistent with the literature [2,11]. The majority of women in the region are housewives. We believe that such a rate has occurs due to the lack of participation of women in the physical workforce in daily life. As stated in the study of Nordqvist et al., the second peak in the distribution of shoulder dislocation among older women was also determined in our study [12]. This result, which is consistent with other literature, consists of elderly female patients in the sedentary household population residing in our country and in Eastern Anatolia (6, 8). As another issue, we think that shoulder fractures accompanying shoulder dislocations are associated with osteoporosis, that is common in the region.

4. Conclusion

In our study, we found a curve with an incidence rate of 18.9/100,000 and two peaks in the age-gender distribution graphic; the first of these was composed of young active men and the second was composed of sedentary women in older ages. Our study is similar to the world literature but conducts in other parts of Turkey reveals a different rate. It is required to establish a more demographic chart with more number of patients for each region in Turkey. We believe that our study includes valuable data to be used as a source of information and further studies on this issue.

Keywords: Shoulder dislocation; incidence; demographic characteristics; traumatic shoulder dislocation; recurrent dislocation

5. Limitations

The limitations of our study are being single-centered and attempting to sample the entire Eastern Anatolia region in a single province and insufficient follow-up and recurrence rates due to migration in the demographic structure of to the region.

6. References

1. Cutts S., Prempeh M., Drew S. Anterior shoulder dislocation. Ann R CollSurgEngl. 2009;91:2–7. doi: 10.1308/003588409X359123
2. Simonet WT, Melton LJ 3rd, Cofield RH, Ilstrup DM. Incidence of anterior shoulder dislocation in OlmstedCounty, Minnesota. ClinOrthopRelatRes 1984;(186):186-91.
3. Liavaag S, Svenningsen S, Reikerås O, Enger M, Fjalestad T, Pripp AH, et al. The epidemiology of shoulder dislocations in Oslo. Scand J MedSci Sports 2011;21:e334-40.
4. https://biruni.tuik.gov.tr/medas/?kn=95&locale=tr
5. Tafi M, Canbora MK, Köse Ö, Erc ÖFE, Gem M. Demographic and clinical characteristics of traumatic shoulder dislocations in an urban city of Turkey: a retrospective analysis of 208 cases. 2013;47(3):147–52.
6. Zacchilli MA, Owens BD. Epidemiology of shoulder dislocations presenting to emergency departments in the United States. J Bone JtSurg - Ser A. 2010;92(3):542–9.
7. Szyluk KJ, Jasiński A, Mielnik M, Koczy B. Incidence of Posttraumatic Shoulder Dislocation in Poland. MedSciMonit [Internet]. 2016;22:3967–74. Available from: http://www.medscimonit.com/abstract/index/idArt/900902.
8. Krøner K, Lind T, Jensen J. The epidemiology of shoulder dislocations. ArchOrthopTraumaSurg. 1989;108(5):288–90.
9. teSlaa RL, Wijffels MPJM, Brand R, Marti RK. The prognosis following acute primary glenohumeral dislocation. J Bone JointSurgBr

[Internet]. 2004;86–B(1):58–64. Available from: http://online.boneandjoint.org.uk/doi/10.1302/0301-620X.86B1.13695.

10. Hovelius L. Shoulder dislocation in Swedish ice hockey players. Am J Sports Med 1978;6:373-7.

11. Hovelius L. Incidence of shoulder dislocation in Sweden. Clin Orthop 1982;166:127-31.

12. Nordqvist A, Petersson CJ. Incidence and causes of shoulder girdle injuries in an urban population. J ShoulderElbSurg. 1995;4(2):107–12.

Age Groups	**Recurrent Dislocation**		**First Dislocation**		
	Male	**Female**	**Male**	**Female**	**Total**
Under 20	4	2	18	0	24
Between 21-30	12	1	40	2	55
Between 31-40	4	1	22	2	29
Between 41-50	0	0	17	5	22
Between 51-60	2	0	4	1	7
Between 61-70	1	1	11	11	24
Between 71-80	0	0	4	9	13

Over 80	0	0	1	6	7
Total	**23**	**5**	**117**	**36**	**181**
Average age (year)±SD	**29,86±13,93**		**41,84±20,9**		

Table-1. Distribution dislocations according to the age groups

Age Groups	**Falling**		**Trauma**		**Traffic Accident**		**Sports Injury**		**Epilepsy and Electric shock**		
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**Total**
Under 20	11	1	8	1	1	0	1	0	1	0	24
Between 21-30	21	1	21	1	3	0	6	0	1	1	55
Between 31-40	11	1	10	1	1	0	2	0	2	1	29
Between 41-50	9	4	4	1	4	0	0	0	0	0	22
Between 51-60	2	0	3	1	1	0	0	0	0	0	7

Between 61-70	5	8	2	4	5	0	0	0	0	0	24
Between 71-80	3	8	0	1	1	0	0	0	0	0	13
Over 80	1	5	0	1	0	0	0	0	0	0	7
Total	**91**		**59**		**16**		**9**		**6**		**181**

Table-2. Distribution of dislocation mechanism according to the age groups

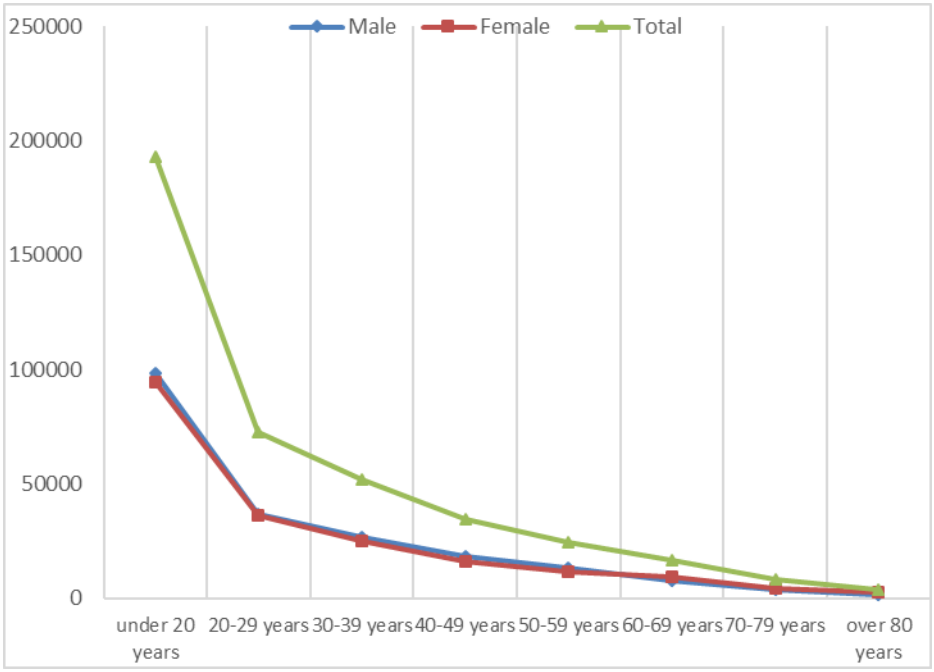

Figure-1. Demographic data of the Mus province in 2017.

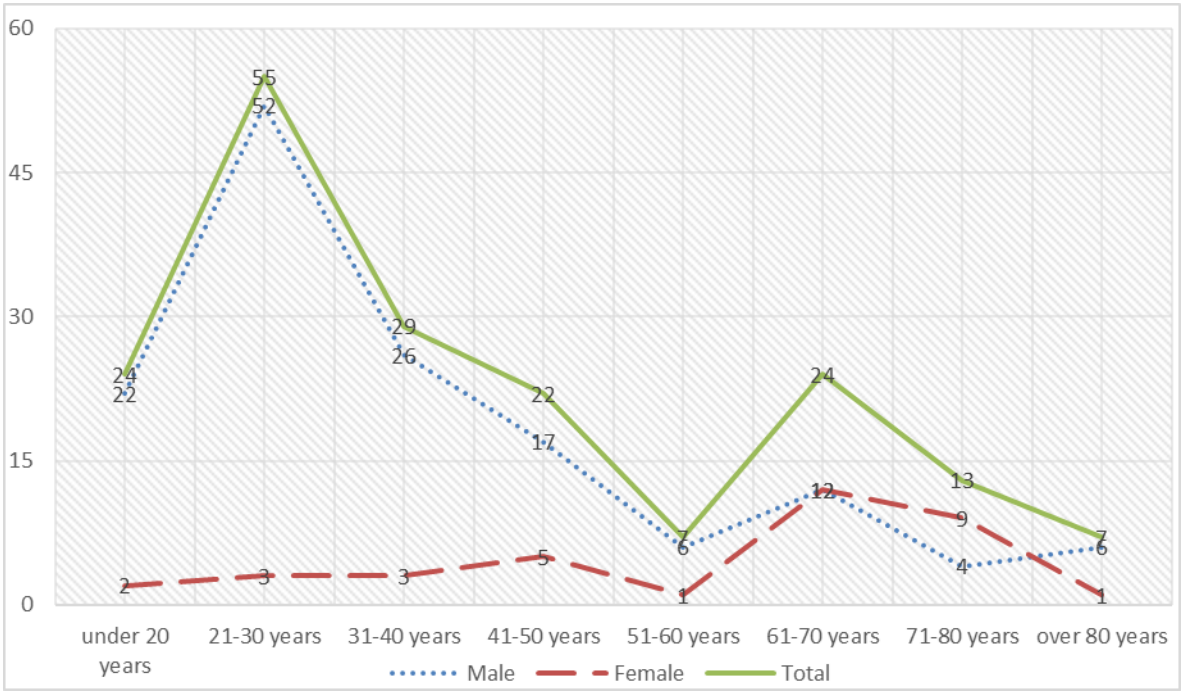

Figure-2. Distribution of shoulder dislocation according to age and gender

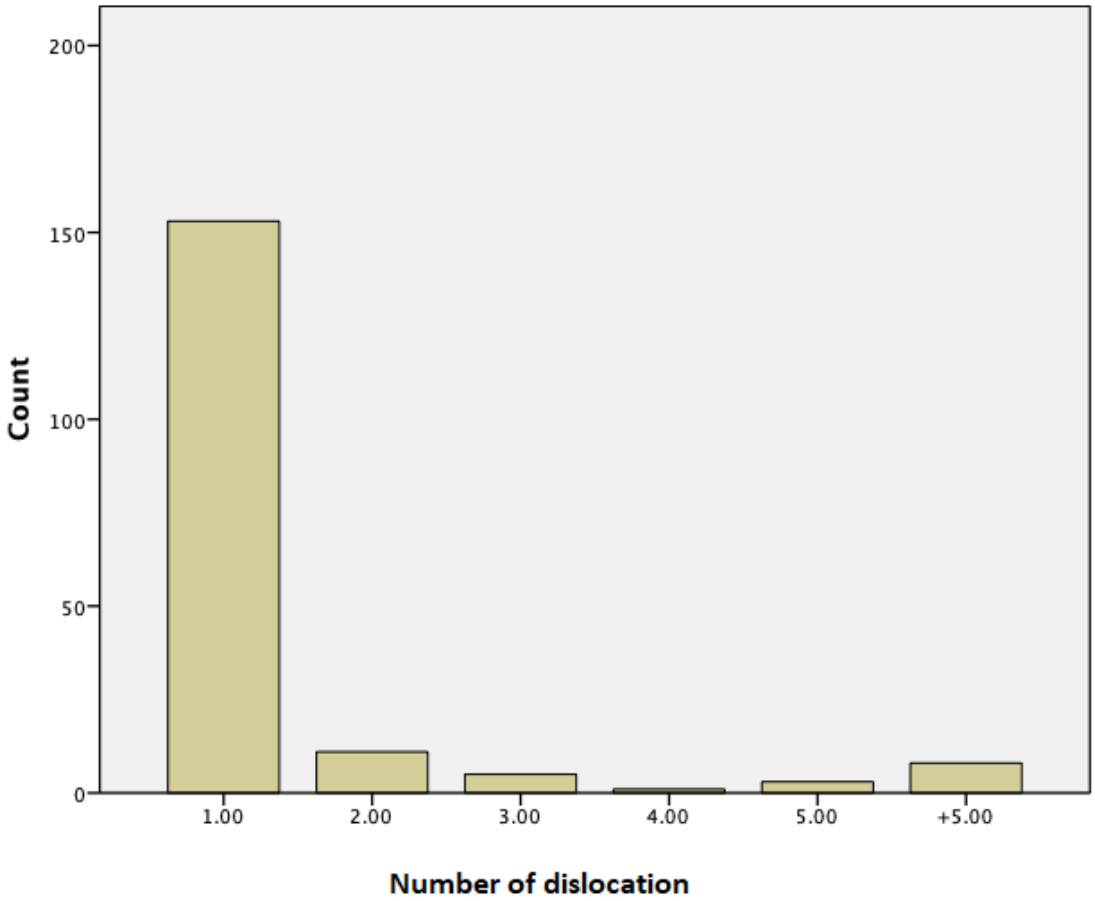

Figure-3. Distribution of the patients according to the number of dislocations

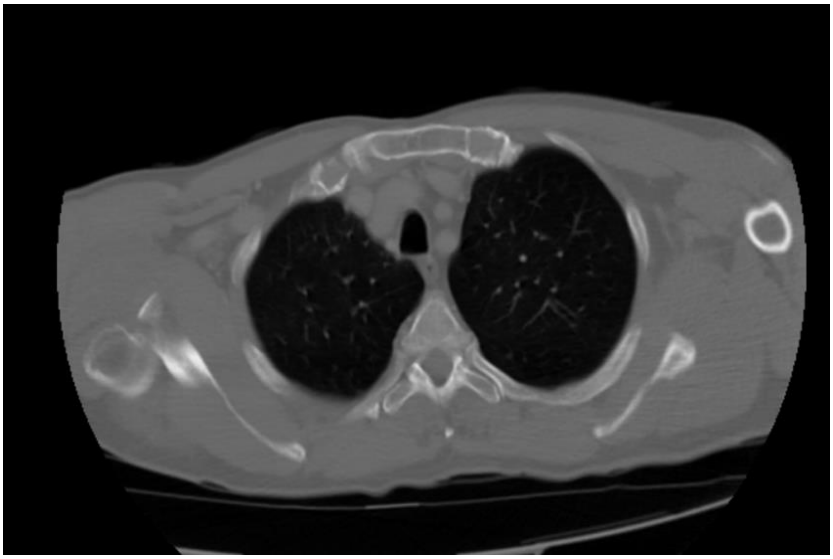

Figure-4. Posterior shoulder dislocation of a 74-year-old male patient after an in-vehicle traffic accident

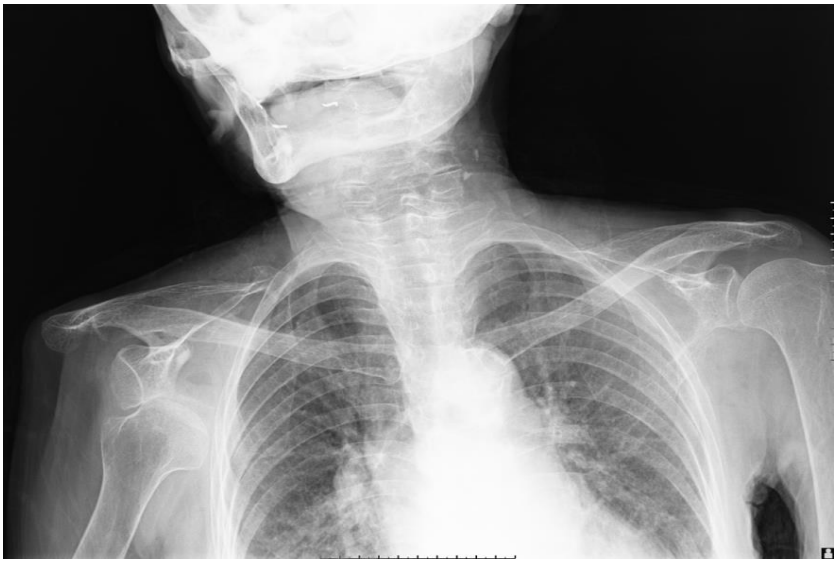

Figure-5. Inferior shoulder dislocation of a 75-year-old female patient after falling

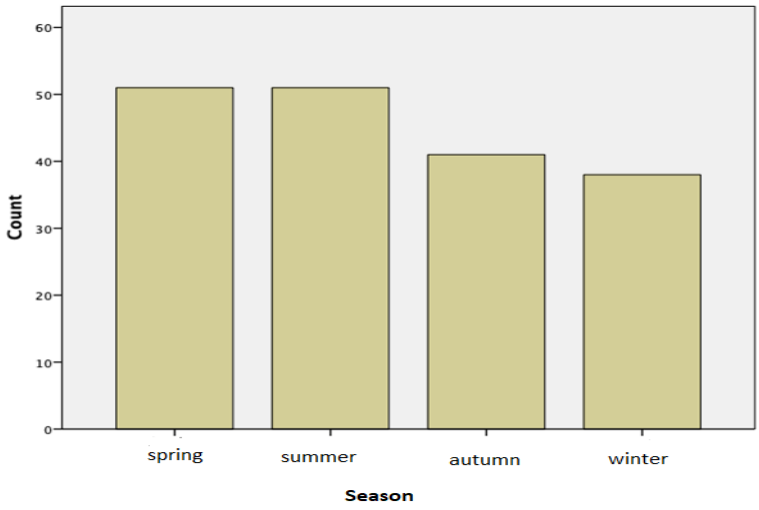

Figure-6. Distribution of the number of patients according to seasons

Figure-7. Tuberculum majus fracture and shoulder dislocation of a 20-year-old male patient after falling