CLAVICLE FRACTURE AND CONTRIBUTION OF THE ORTHOPEDIC PLASTER TECHNICIAN

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Abstract

The clavicle fractures are very common especially at young ages. Mostly, fractures occur in 1/3 of the middle of the clavicle and are common in men. The risk factors that affect these fractures are different in different age groups.

Aim

The aim of this study is to find out the incidence of clavicle fracture in the service of Orthopedics and Traumatology Tirana, Albania as well as the evaluation and implementation of orthopedic plaster technician procedures in the treatment of these fractures

Material & Methodology

This study is retrospective type. The information was collected from the Department of Plaster at Orthopedics- Traumatology service in Hospital University of Trauma from January 2016 to December 2017. The study excluded cases that required surgical intervention. For the data analysis is used the statistical package 20.0. The categorical variables are expressed by frequency and percentage. Is evaluated as significant the p value < 0.05.

Results

From 2016 to 2017 there are 167 cases with clavicle fracture most common in men. The most common age group is 15-25 years old with 69 cases for both genders, followed by age group 26-50 years old with 42 cases. By conservative treatment there are 133 happy patients compare with 34 cases (20.4%) which are dissatisfied by this treatment.

Keywords: clavicle fracture, fracture risk factors, clinical diagnosis, x-ray, conservative treatment.

Background

The clavicle is a bone that serves as a single bony structure that connects the skeleton to the shoulder via the medial sternoclavicular junction and laterally via the acromioclavicular junction. It is a very complex structure that plays a very important role in movement, stability, or even in the aesthetic aspect of the shoulder [1]. It is divided into three parts through which the fracture site is also described. The clavicle fracture has a high frequency compared to the other bones of the body and precisely its middle part (1/3 of the middle) experiences frequent fractures, about 80% of all fractures that affect the clavicle is in this area. This is because its two extremities are well fixed by ligaments and muscles. The middle part has no ligaments to fix it and so it is more vulnerable to trauma and injuries. Men experience the highest frequency compared to women, and in a young age, but there are cases even at an advanced age as a result of slips, traumas, etc [2,3,4,5]. So, the reasons for the occurrence of a clavicle fracture depend on direct trauma on clavicle, falls with the shoulder, indirect trauma or even birth trauma.

Several classifications related to clavicle fracture have been suggested as we can menstion:

The Allman classification (the physician who did the classification in 1967) which is based on the location of the fracture.

- **Group 1**, the fracture occurring in the middle of the clavicle (with the highest incidence)
- **Group 2,** fractures occurring in the distal or lateral part of the clavicle.
- **Group 3,** fractures occurring in the proximal area [6].

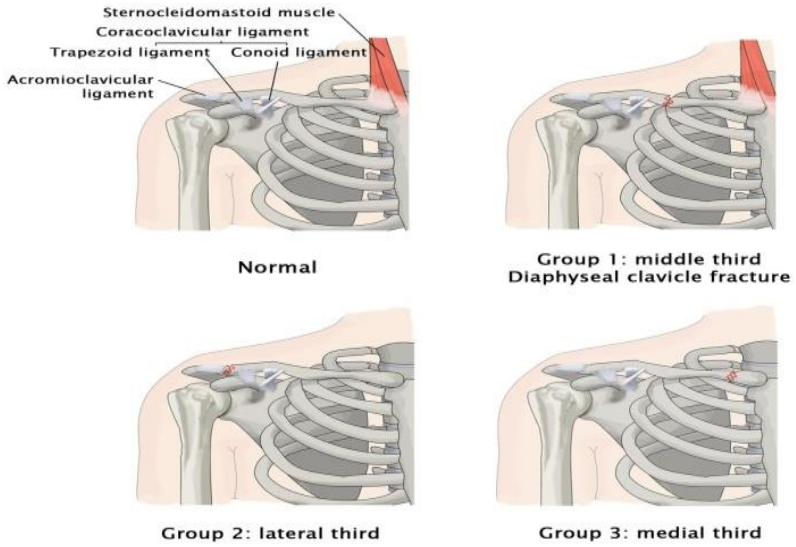


Fig.1

But is another physician, Dr. Neer, who divided these groups into subcategories by describing them as: non displaced fracture, displaced fracture and multi-fragmentary fracture.

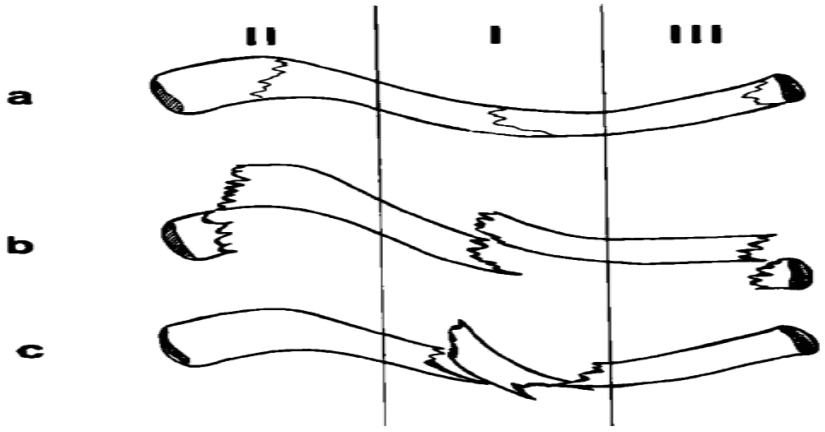


Fig.2

The Edinburgh classification introduced by Robinson has been seen to be more used. This classification is interested in the entire clavicle, but also considers the problems that each of its segments can bring. So it focuses not only on the location but also on the extent of the displacement, the number of fragmentation as well as the articular extent [7,8].

Traditionally, the fractures were treated in conservative way (even now finds use), which gives good results in movement, a high percentage of success in the union of the fractured site. But later studies began to categorize based on the complaints that the patients had, such as: pain, loss of strength, aesthetic problems as a result of the shortening and poor adhesion of the clavicle fracture. Other, more recent studies have shown the satisfaction of patients who underwent surgical interventions restoring clavicle length and increased functionality when conservative treatment failed [9,10,11,12].

In fact, even it has a high frequency in occurrence, the treatment method is still debated. Therefore, for their management and treatment, several factors such as: age, functionality and type of fracture must be taken into consideration. Conservative treatment is applied to fractures of 1/3 of the middle of clavicle and not displaced. It presents a low incidence of non-adhesion after this treatment ranging from 0.03%-5.9%. There are different ways of conservative treatment, but the most used is the figure - of- eight bandage or other orthopedic support equipment [13,14]. After immobilization with the method of the figure - of- eight, it is tightened in order to keep it in the right position, combining it with the posterior position of the shoulder, thus solving the problem with the length of the clavicle. Such positioning should yield good results for both shoulder and arm functionality. Another advantage of this immobilization is that both hands of the patient are free. During the time, the patient should be assessed for blood circulation, mobility, sensitivity or even the condition of the skin. The immobilization duration range from two to six weeks depending on patients age . The complications that can happen during this treatment method are such as: lack of adhesion, poor adhesion which is diagnosed by radiography but also based on sympatology and deformities of the scapula [15,16]. For other cases, especially fractures with displacement, surgical intervention is performed [17,18].

The aim of this study is to find out the incidence of clavicle fracture in the service of Orthopedics and Traumatology, Tirana, Albania as well as the evaluation and implementation of orthopedic plaster technician procedures in the treatment of these fractures.

Methods

This is a retrospective study which was conducted to investigate the incidence of clavicle fractures in the service of Orthopedics and Traumatology. The data is obtained by the Plaster service at University Hospital of Trauma for the period from January 2016 to December 2017. In the study, cases that needed surgical intervention were excluded. While all patients who would be treated by non surgically way and who did not present displacement fractures were included. During follow up for this patients is used Simple Shoulder Test. It is a standardized test which contains 12 questions about shoulder function before and after treatment. The answers are "yes" or "no" [19]

The statistical package SPSS version 20 was used to analyze the data. Categorical variables are expressed in frequency and percentage. The most important variables evaluated during this survey were not only demographic data but also data that showed in which clavicle the fracture occurred, the satisfaction of patients related the conservative treatment and also the duration of immobilization. In this survey took part 167 patients. The value of p <0.05 is considered significant.

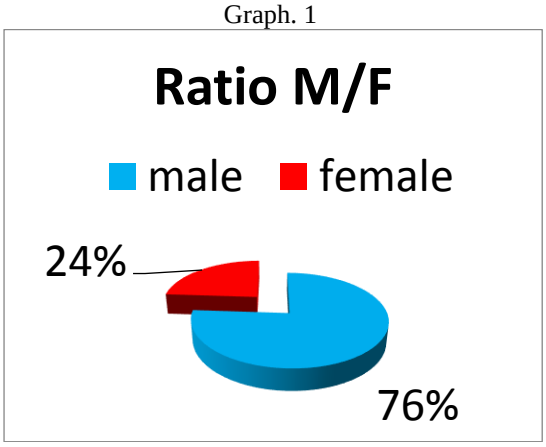
Results

This study includes a population of 167 patients for a period of time from January 2016 to December 2017. From the study of clinical records, it results that the most frequent in experiencing clavicle fractures are men.

Tab.1

Men	Female	Total
127	40	167

Graph. 1



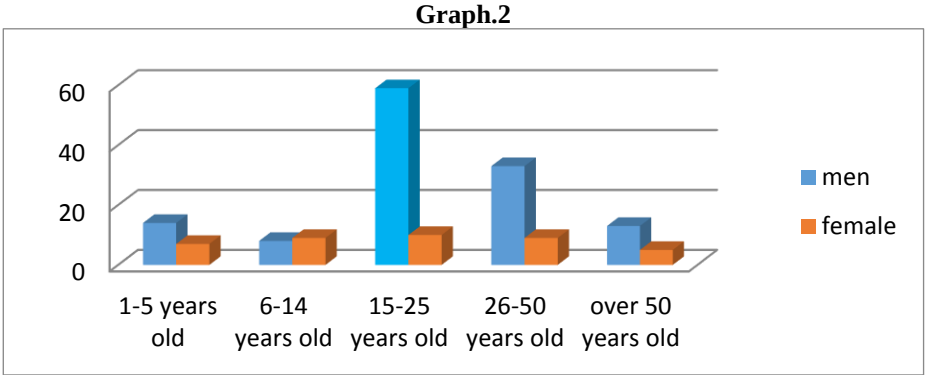
So, 127 (76%) were men and 40 (24%) of cases were female.

The table below shows the age groups that need treatment.

Tab.2

	Age group				
Gender	**1-5**	**6-14**	**15-25**	**26-50**	**Over 50**
Men	14	8	59	33	13
Female	7	9	9	10	5

Graph.2



Male patients who belong at age group 1-5 years old with clavicle fracture are 14 (11%), male patients at age group 6-14 years old are 8(6.3%), while male patients at age group 15-25 years old are 59(46.5%). According the table 2 we see that the age group 26-50 years old are 33 (26%) of cases and the rate of clavicle fracture decrease with increasing age. So for the age group over 50 years old are only 13 (10.2%) patients with this diagnose. The study shows that female patients with clavicle fracture who belongs at age group 1-5 years old are 7 or 17.5% of all cases, at the age group 6-14 years old are 9 (22.5%) females and with a slightly higher frequency is the age group 26-50 years old with 10 (25%) cases.

From the graph, we see that the age group of 15-25 years old had the highest frequency and they are males with 59 cases in total. While women aged over

50 years appear in fewer cases in the study with only 5 cases.

The ratio right/left clavicle fractures in total results that there are 110 right clavicle fracture and 57 cases with left fracture. As we see at the table below.

Tab.3

Fracture distribution by gender and location

Gender	Right	Left
Male	87	40
Female	23	17

Out of 127 male patients, 87 of them have right clavicle fracture and 40 are male patients with left clavicle fracture. There are 40 female patients in total and 23 (57.5%) have right clavicle fracture and 17 (42.5%) of females with left clavicle fracture. The most frequent of clavicle fracture is the right clavicle in men with 87 cases and the lower frequency of clavicle fracture is in women at the left clavicle with 17 cases.

Tab.4

Patients Satisfaction

Gender	Satisfied	Dissatisfied
Male (127 cases)	99 (78%)	28 (22%)
Female (40 cases)	34 (86%)	6 (14%)

According to a standardized questionnaire on shoulder function (Simple Shoulder Test) before and after using conservative treatment, 133 (79.6%) cases were satisfied with conservative way and 34 (20.4%) were dissatisfied. 6 female patients out of 40 in total were dissatisfied and 28 male patients out of 127 in total were dissatisfied. Conservative treatment presents a significant correlation between the type of immobilization and the diagnosis (p= 0.012).

Discussion

This study shows us that the frequency of clavicle fracture for year 2016-2017 was 167 cases, of which 127 cases were male and 40 female. The most affected gender was male as shown in many studies worldwide [20,21,22,23]. In our study the ratio male/ female is 3.2/1.

The most affected age group is 15-25 years old, followed by age group 26-50 with 42 cases in total. Over 50 years old it present an decrease trend. This finding is similar to other studies emphasizing the fact that the risk of clavicle fracture decreases with increasing age [24, 25]. Right clavicle fracture has a high frequency in our study, but this does not represent significance regarding the healing time and fracture location. While in some studies their findings show that there is a slightly higher frequency of left clavicle[26,27].

Traditionally, the treatment of these fractures has been treated by conservatively way by the orthopedic cast technician and they have been successful. In a small percentage it has failed[28]. This method is used in all types of fractures. But in later studies the researchers found that in different types of clavicle fractures such as: multi- fragmentary and displaced fractures or fractures of the extremities of the clavicle surgical treatment is more successful.

In our study, resulted that 133 (79.6%) patients were satisfied with the results achieved with conservative treatment. The treatment method shows a significant correlation between the immobilization method and the diagnosis. Which means that depending on the fracture type, the treatment will also be adapted. The treatment of patients who belong at age group under 5 years old, is done with adhesive plaster, while all others with orthopedic supports and plaster.

However, the treatment of clavicle remains an open debate[29,30].

Conclusion

Clavicle fractures are common fractures in adults. Even though with such frequency the treatment method is still debated. But some researchers recommend that conservative treatment is effective for non-displaced fractures. While the other cases with displacement and shortening of the clavicle with 2 cm need surgical intervention.

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