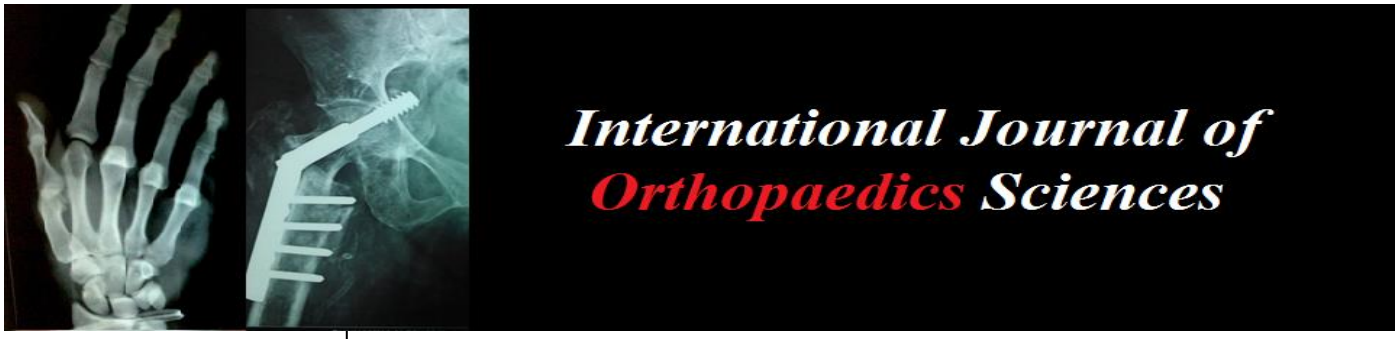

ISSN: 2395-1958
IJOS 2018; 4(3): 494-497

www.orthopaper.com
Received: 13-07-2018
Accepted: 10-08-2018

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Non-surgical treatment of knee ligamentous lesions

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DOI: https://doi.org/10.22271/ortho.2018.v4.i3i.86

Abstract
Introduction: Knee trauma is very common and sometimes compromises its stability. The treatment of these lesions is more and more surgical, but nonsurgical treatment remain having an importance in the management. The purpose of this study was to determine the results of nonsurgical treatment of ligamentous knee injuries in soldiers deployed in northern Mali during a stabilization mission.
Materials and methods: It was a prospective study concerning ligamentous lesions of the knee, treated by orthopedic means in Togo's level 2 hospital and followed for a period of at least 6 months. The International Knee Score (IKS) was used to determine our results. Patient satisfaction was determined by taking into account pain, knee stability and resumption of previous activities.
Results: Twenty-one (21) patients were treated. They were 18 men (85.7%) and 3 women (14.3%). The average age of the patients was 32.43 years old. We found 7 cases (33.4%) of benign sprain, 9 cases (42.8%) of medium severity sprain and 5 cases (23.8%) of severe sprain. After administration of the analgesic, immobilization was made by a knee brace and sometimes a plaster splint. Rehabilitation was started at the end of immobilization. The control after 6 months of follow-up allowed to find 57,1% of excellent result and 9,5% of bad result
Conclusion: Nonsurgical treatment of ligamentous lesions gives good results when properly conducted. When a surgical treatment is decided for these lesions, it is recommended to make the rehabilitation of the knee before the operation to improve the results.

Keywords: Ligamentous lesions, knee, nonsurgical treatment, northern mali

Introduction
The knee is a joint subject to numerous constraints. It stability is ensured by several capsulo-ligamentary structures which can be injured by trauma witch sometimes compromise this stability [1]. The ligament lesions range from simple sprains to dislocations that can be complicated by vascular lesions involving the limb's vital prognosis [2]. These lesions are more frequent among high level athletes and some professionals with intense sporting activities as the soldiers. The diagnosis of lesions is based on a well-conducted and thorough clinical examination witch allowed to determine the different ligamentous groups injured [3, 4]. Standard radiography eliminates fractures of the distal femur, proximal tibia of the patella, or a Segond fracture. Magnetic resonance imaging (MRI) is the best of choice for precision diagnosis of capsulo-ligaments lesions [5-7]. Management has evolved quickly with many techniques of ligament repair or reconstruction and the advent of arthroscopy but there are still many controversies. These controversies concerns the choice between nonsurgical or surgical treatment, ligament repair or reconstruction, the use of an autologous graft or an allograft and the operating time. For this purpose several publications have been made to propose decision trees to surgeons [8, 9].
Although surgical treatment has taken place over orthopedic treatment, conditions are sometimes unavailable for this surgery [2], especially in developing countries where the technical platform is precarious and the operating equipment inadequate. During their deployment to peacekeeping missions in northern Mali, soldiers subjected to intense physical exercise had many injuries including ligamentous knee injuries.

These patients were admitted to Togo's Level 2 hospital. The hospital does not have CT or MRI and even less equipment to perform ligament reconstructions. Patients with ligamentous lesions of the knee were therefore treated with non-surgical treatment.

The purpose of this study was therefore to determine the results of the non-surgical treatment of ligamentous knee injuries in soldiers deployed in northern Mali during a stabilization mission.

Materials and methods

Framework of study

The Togo Level 2 Hospital was based at Kidal and was a referral health facility in the northern part of Mali. Its main mission is to provide medical and surgical care to soldiers engaged in the United Nations Multidimensional Integrated Stabilization Mission in Mali (Minusma). Secondarily, it provides medical assistance to the civilian population in this sector. The hospital had a medical team, an air evacuation team, a surgical unit, a radiology unit, a laboratory, a dental office and a physiotherapy team. The radiology unit only had a standard X-ray machine and an ultrasound system. The physiotherapy team was composed of two physiotherapists led by the orthopedic surgeon. The surgical team is composed of a general surgeon, an orthopedic surgeon, an anesthetist and six nurses. The capacity of the hospital was 20 beds. The wounded were evacuated from level 1 structures to the level 2 hospital by the medical team of the various contingents. Some patients consulted directly in our structure without going through a level 1 hospital.

Patients and means

Our work is a prospective study on ligamentous lesions of the knee, treated by orthopedic means in Togo Level 2 hospital and then followed for a period of at least 6 months, among soldiers deployed in the northern sector of Mali in the framework of MINUSMA. This study was conducted from June 1, 2017 to June 31, 2018. All patients with old ligament lesions (prior to the mission and our study period) and those whose follow-up was less than 6 months were not included in our study. The clinical careful examination allowed us to make the diagnosis of ligamentous lesions. These lesions were classified into three categories, benign sprain, medium severity sprains and severe sprains. All patients received standard radiography (Figures 1) to eliminate bone lesions.

Fig 1: Standard radiography of the knee face and profile

Management consisted of analgesic treatment followed by immobilization for one to three weeks. Rehabilitation sessions were started immediately after the immobilization period (Figure 2)

Fig 2: Knee Rehabilitation Session

We used the gymnastic equipment of the hospital to strengthen the resources of this physiotherapy (Figure 3).

Fig 3: Knee Rehabilitation Using Gym Equipment

Patients were seen at 2 months, 4 months, 6 months and 9 months for clinical assessment. The IKS (International Knee Score) score [10] was used to evaluate functional results. They were excellent for a score between 80 and 100, good for a score of 70-79, fair for a score of 60-69 and bad for a score below 60. Patient satisfaction was also determined by considering pain, knee stability and resumption of previous activities.

Results

Twenty-one (21) patients were treated and followed in our hospital during this period. There were 18 men (85.7%) and 3 women (14.3%). The mean age of the patients was 32.43 years with extremes of 18 and 52 years old. The right knee was reached in 15 cases (71.4%) and the left knee in 6 cases (28.6%). After clinical examination, we diagnosed 7 cases (33.4%) of benign sprain, 9 cases (42.8%) of medium severity sprain and 5 cases (23.8%) of severe sprain. Benign sprains were represented by simple elongation of a ligament characterized by pain in the path of that ligament. Severe sprains included central pivot lesions or multiligamentous lesions on the same knee. The immobilization was done by a knee brace and sometimes by plaster splint (figure 4).

Fig 4: immobilization with knee brace

Duration of immobilization was 1 week for 7 patients with benign sprain and 2 to 3 weeks for other patients based on knee pain. Seven (33.4%) patients performed 32 rehabilitation sessions, 6 patients (28.6%) performed 48 sessions, and the remaining 8 (38.09%) had 64 sessions. Control after 6 months of follow-up found 12 cases (57.1%) of excellent results and 2 cases (9.5%) poor results (Table 1).

Table 1: distribution according to the results

	Numbers	Percentage (%)
Excellent	12	57,1
Good	6	28,6
Fair	1	4,8
Bad	2	9,5
Total	21	100

Considering patient's satisfaction, 19 (90.5%) patients including all patient who had benign and medium severity sprain and 3 patient who had severe sprain reported being satisfied with their treatment. They had noted a loss of pain, and a good stability of the knee witch allowed them to resume their previous activities. Two (9,5%) patients of those who had severe sprain were not satisfied with the treatment. They noted a regression of the pain, but it remain an instability of the traumatic knee witch prevented them from resuming physical exercise and some military activities.

Discussion

The aim of this study was therefore to determine the results of the non-surgical treatment of knee ligamentous injuries in soldiers deployed in northern Mali during a stabilization mission. This study presents several biases in particular: the weakness of sample, the absence of magnetic resonance imaging to refine the diagnosis of these ligamentous lesions and our short duration patient follow-up compared to another series. But the results of this study could be discussed through data of the literature. We recorded 21 patients with an average age of 32.42 years. This sample is very small compared to Nabian and al [11] study in 2016 who recorded 2,700 ligamentous lesions with a mean age of 31.32 years. Clayton and Court-Brown [12] found in their series an average age of 20 years which reflects the youth of subjects with ligamentous lesions of the knee. Our diagnosis was based on careful clinical examination and X-ray was use to eliminate fracture. Our center did not have a CT and even less an MRI. Magnetic resonance imaging allows to visualize the lesions of each ligament, cartilage structures and menisci. Some non-visualizable bone lesions on X-rays can also be observed. Our study found mainly sprains with a 23.8% severe sprain, which represents a lesion of the central pivot or a multi ligamentous lesions. Gage and al [13] found 42.1% ligamentous lesions of the knee. The lack of knee dislocation in our study may be related to our small sample but also to the lesional mechanism that was often occur in a sport or work accident. The management of these lesions can be as well surgical or orthopedic including the lesions of the central pivot. Thus for Fournier [2], all lesions and far from anterior cruciate ligament must not be operated. A well-conducted rehabilitation allows, a compensation for the instability and a resumption of sports activity in many sports. Rehabilitation should pay close attention to proprioceptive and muscular strengthening, especially the hamstrings, as they help to fight against anterior and rotatory subluxing forces. The steps of conservative management do not differ significantly from the post-operative treatment. In the initial stage, the focus is on analgesia, repeated icings, analgesics, possibly nonsteroidal anti-inflammatory drugs, or even an evacuating puncture. An orthosis can be worn. Conservative management may be the preamble to a surgical attitude [2]. Filbay S and al [14] reports better results of anterior cruciate ligament surgery preceded by rehabilitation compared to surgery without preoperative rehabilitation. We obtained 12 cases (57.1%) of excellent results and 6 cases (28.6%) of good results in our studies. These results were optimistic compared to those of the literature could be related to short duration of follow-up. Ankit G and al [9], Charles L *et al.* [8] noted in their meta-analyzes a superiority of surgical treatment compared to non-surgical treatment for follow-up of more than 5 years. They report, however, the lack of difference between the two treatments when considering the loss of pain, knee stability and the resumption of the level of previous activities. Despite the literature in favor of surgical treatment in ligamentous lesions of the knee, non-surgical treatment remains a better therapeutic option when the indications are well established [15]. Well-conducted orthopedic treatment would give better results compared to poorly perform surgical treatment with inadequate equipment.

Conclusion

The ligamentous lesions of the knee are very frequent, but their severity are often underestimated, especially in developing countries where there is a crucial lack of equipment for both the precise diagnosis and the surgical treatment. We obtained good results after 6 months of follow-up in a hospital without equipment pour surgical treatment of knee ligamentous injuries. Orthopedic treatment when properly conducted offers results comparable to surgery with respect to knee stability and the patient's ability to return to pre-injury activity levels. Another studies must be done with longer period of follow-up to confirm these results of non-surgical treatment.

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