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Update on Standard Radiography in the Management of Osteo-Articular Emergencies in the "Marie Curie" Medical Clinic

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Abstract **Original Research Article**

Introduction: Bone and joint emergencies mainly include traumatic lesions and bone and joint infections. The aim of the work was to report the current place of standard radiography in the management of traumatic osteo-articular lesions in the Medical Clinic "Marie Curie" of Bamako. ***Materials and Methods:*** The study took place in the radiology department of the Medical Clinic "Marie Curie" in Bamako, Mali. The 1745 patients who underwent standard radiography during the 12-month period were studied. The parameters concerned were the socio-epidemiological aspects and the type of simple or complex trauma. ***Results:*** In our series, the male sex was dominant in 58% of cases. Public road accidents were the most accident-prone with 78%. 61.37% of radiographs were pathological. The lower limb was the most affected (40%). The most affected joint was the knee (24%), followed by the ankle/foot (17%), the shoulder (7%) and the elbow (6%). The skull and spine were affected in the order of 4% of cases and 2% of cases. There was associated soft tissue involvement in 68% of cases**.** ***Conclusion:*** The permanent availability of standard radiography and modern cross-sectional imaging methods such as the scanner in commune V in the city of Bamako is becoming more than ever a necessity because the diagnostic approach to osteo-articular trauma now calls on its imaging resources for appropriate treatment.

Keywords: X-ray, trauma, osteo-articular and "Marie Curie" clinic.

INTRODUCTION

Bone and joint emergencies mainly include traumatic lesions and bone and joint infections [1]. The osteo-articular traumatic pathology that concerns us is frequent in daily practice in the emergency room with approximately 6,000 cases per day in France for foot and ankle involvement. It represents 30% of admissions for all traumatic pathologies combined [2]. Trauma is generally understood as a physical disorder caused by a more or less serious injury caused by an external agent [3-5]. All other joints, long and short bones can be affected. These osteo-articular lesions are especially dominated by the lines of fracture passing from the simplest to the most complex. The interpretation of the initial standard radiographic assessment is essential in order to make the lesion assessment. It is often difficult to interpret because of the overlapping of the bones, which can create false lesion images [2]. Faced with the complexity of the osteo-articular anatomy, you will always have to be helped by the mechanism of the lesions, associated with the painful location and the degree of functional impotence, which can guide the interpretation of the images. To our knowledge, few studies have focused on this subject in Mali, hence the need for this work, the aim of which was to report the current place of standard radiography in the management of traumatic osteo-articular lesions in the medical clinic "Marie Curie" of Bamako.

MATERIALS AND METHODS

Retrospective study carried out in the radiology department of the Medical Clinic "Marie

Curie" in commune V of the district of Bamako in Mali in Africa over a period of 12 months from November 2022 to October 2022.

The patients benefited from a standard X-ray examination using a GE (general electric) brand device with fluoroscopy put into service in 2009.

The examination protocol included a conventional X-ray in AP and lateral view in all patients and often oblique view. The parameters concerned were the socio-epidemiological aspects and the type of trauma. Our study population concerned 1745 patients

Inclusion criteria: all patients who underwent an X-ray for trauma during the study period.

Non-inclusion criteria: patients having performed the radiography without notion of trauma

RESULTS

Of the 1745 patients concerned by standard X-rays, the 1070 patients were pathological in 61.37% of cases and 694 X-rays were normal (38.63% of cases) (Table 1).

Table 1: Distribution of patients in normal or pathological

Patients	Numbers	Percentage
Pathological	1070	61,37
Normal	694	38,63
Total :	1764	100

In this series the male gender was dominant with 58% of cases against 42 female patients (Figure 1).

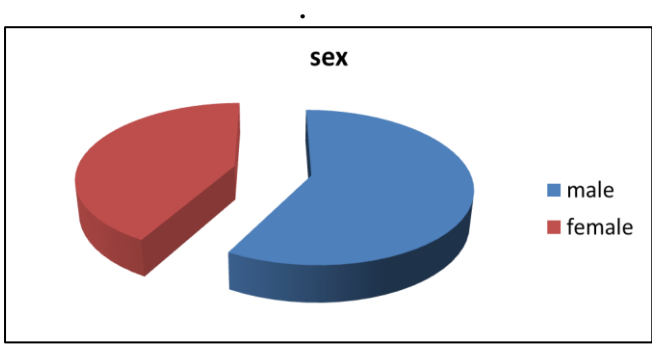

Figure 1: Breakdown of patients by gender

Among the 431 patients who had post-traumatic lesions, public road accidents (AVP) were the most accident-prone with 78% followed by a fall or domestic accident in 17% of cases and intentional blow and injury (CBV) in 5% of cases. The lower limb was the most affected with (40% of cases) among which we could mention the leg and the thigh (femur, tibia and fibula). The most affected joint was the knee with (24% of cases) whose left knee was more affected than the right knee, followed by the ankle and/or foot with (17% of cases), the shoulder with (7% of cases) and elbow with (6% of cases). The skull and spine were slightly affected in the order of 4% of cases for the skull and 2% of cases for the spine (Figure 2).

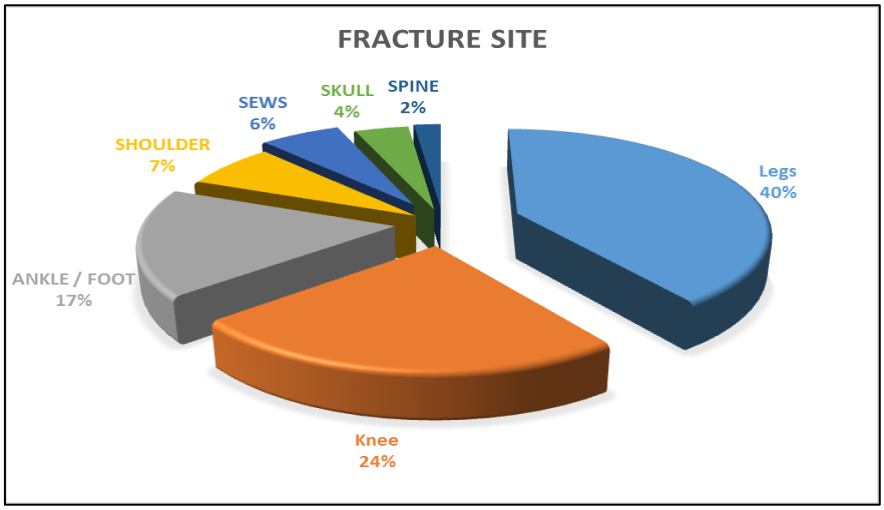

Figure 2: Distribution of patients according to fracture sites

Inflammatory involvements of the perio-osseous or peri-articular soft tissues were present in 44.09% of cases. We divided the post-traumatic lesions into simple fractures which had presented 25.29% of cases and into complex fractures in 30.62% of cases (Table 2).

Table 2: Distribution of patients according to type of fracture

Post traumatic injury	Numbers	Percentage
Complex fractures	132	30,62
Fractures + inflammatory soft tissue thickening	190	44,09
simple fracture line	109	25,29
Total :	431	100

Figures (3, 4, 5 and 6) illustrate a few types of fractures described above in relation to osteo-articular damage, ranging from the simplest to the most complicated.

Figure 3 (A, B and C): X-ray of the feet in front incidence (A and B) and oblique incidence (C) shows a fracture line with overlapping of the distal ends of the metatarsals of the 2nd, 3rd and 4th ray (A) and a thrust fracture of the proximal end of the first ray metatarsus of the foot (B and C)

Figure 4: (A and B): X-ray of the leg in front profile view (A) and of the forearm front view and profile view (B) shows a complex diaphysis fracture of the lower 1/3 of the tibia (A) and a single double fracture line of the middle 1/3 of the ulna and radius (B)

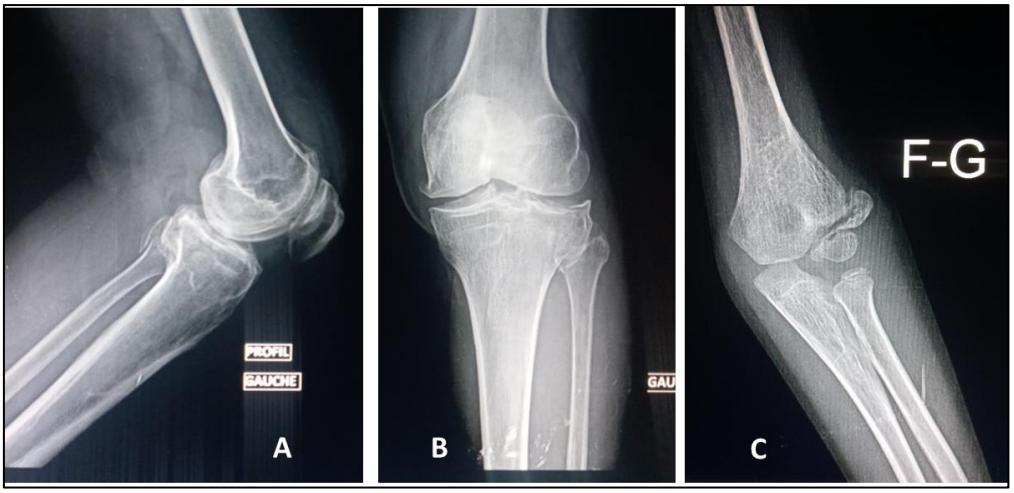

Figure 5 A, B and C): X-ray of the left knee in front and profile view (A and B) and of the left elbow in front view (B) shows a complex fracture with depression of the external tibial plateau and the upper extremity of the fibula (A and B) and an olecranon fracture associated with an inflammatory thickening of the peri-articular parts (C)

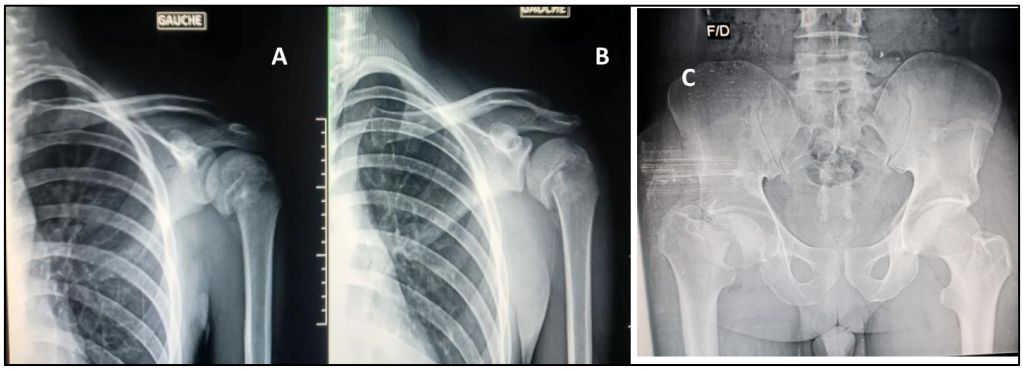

Figure 6: (A, B and C): X-ray of the left shoulder in AP and oblique incidence (A and B) of the pelvis from the AP (C) shows a dislocation fracture of the left humeral head (A and B) and a complex unstable overlapping fracture of the right femoral neck passing through the trochanters (C)

DISCUSSION

Socio-epidemiological aspect

In our service located in the center of the Mali district, in commune V of the district of Bamako not far from the main road which leads to the airport, the osteo-articular trauma had a frequency of 40.28%. And was one of the first reasons for carrying out an emergency X-ray. In the literature we had found a much higher frequency respectively 86.02% [6] and 92% of cases [7]. This difference is explained by the frequentation of the clinic by several organ specialists.

In our study, 58% of the men were victims of osteo-articular trauma against 42%, which is superimposable on many studies in the literature [6, 8-10].

This male predominance could be explained by the fact that men constitute the most mobile social stratum and the most exposed to various accidents. Road accidents are the most frequent etiology with 78% of cases. This high frequency could be explained by an increase in the young population, the increase in the car fleet, non-compliance with the Highway Code. Abuse of alcohol and narcotics. A constant shared in the literature [7, 8, 11-13].

X-ray aspect

The standard X-ray is, as a general rule, the first examination carried out in the exploration of osteo-articular trauma. As a result, it is often a non-radiologist, emergency physician or surgeon who performs the first interpretation. However, some lesions are not obvious and may be missed or underestimated [14]. The interpretation of the initial standard radiographic assessment is essential in order to assess the lesion and to propose appropriate treatment without delay in 60 to 70% of cases according to Huguet [15].

This radiographic examination must be done in two orthogonal incidences (face and profile) but often supplemented by other incidences such as oblique to find the maximum number of lesions.

Our study showed that all bone segments and joints can be injured with a predominance of fracture lesions in the lower limb (40% of cases). This is also noted by M. Diarra *et al*., [6] who found that leg fracture was the most common in their study with

60.09% of cases. This could be explained by the superficial situation of the bones of the leg. They can be encountered in different types of accidents [16]. In order, the knee was the most affected joint (24% of cases) with the left knee being the most affected than the right knee, followed by the ankle and/or foot with (17% of cases), of the shoulder with (7% of cases) and of the elbow with (6% of cases). The skull and spine were slightly affected in the order of 4% of cases for the skull and 2% of cases for the spine. These results are comparable to those of the work of Mbo Amvene *et al*., [3]. In the literature, the most affected joint is the ankle [17], the ankle or the foot comes second in our case, which was affected by the fracture in 17% of cases. We found a few cases of dislocation associated with more frequent fractures in the shoulder than in the elbow. A Results similors to that of the literature [6, 18].

This could be explained by the anatomical situation of this joint because it is the most mobile joint of the human body and weak musculature. Inflammation of the periosseous and periarticular soft tissues (contusion and wounds) 44.09% of cases are the most frequent because they are the most vulnerable lesions. This result is consistent with many studies in the literature [6, 8]. Knowing that conventional radiology, which practically has its limits [3, 19], radiographic presentations, can take the form, among other things, of bone lesions and/or intra- or peri-articular soft parts that can be better visualized by the cross-sectional images that are ultrasound, scanner and even better MRI [20]. A few patients had additional ultrasound and especially CT in complex fractures in order to adapt treatment by traumatologists. The MRI complement is meager given its inaccessibility and the high cost in our Malian context.

CONCLUSION

Trauma is a physical disorder caused by a more or less serious injury caused by an external agent, most often a road accident, a fall or a blow and voluntary injury. Conventional radiography has revealed fracture lesions and mostly dislocations, thus guiding the clinician in his management.

The permanent availability of standard radiography and modern cross-sectional imaging methods such as the scanner in commune V in the city of Bamako is becoming more than ever a necessity because the diagnostic approach to osteo-articular trauma now calls on its emergency imaging resources for appropriate treatment.

Conflict of Interest: The authors declare that they have no conflict of interest.

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