

Case Series

Analysis of misdiagnosis and malpractice in orthopaedic traumatology: retrospective observational study of 13 cases in a teaching university hospital

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ABSTRACT

Orthopedics surgery has been a topic in medical malpractice for more than 130 years. The main type errors are diagnostic, treatment, communication, evaluation, environmental or system-related problems. These medical errors arouse more and more interest among our populations and degrade the doctor-patient relationship to the point of seeing more and more legal overtones. This case series presents thirteen patients with major clinical consequence resulting from a misdiagnosis or malpractice. The average age of the patients was 43.5 years. 92% of medical errors were linked to an initial admission to the emergency department. Traumatic injuries were most frequent (84,61%), including 10 cases of fractures and 1 case of dislocation. Cases of misdiagnosis were less frequent than malpractice but had serious consequences, with 1 death and 3 major amputations. Unrecognized vascular injuries remained the most common cause. The causes of malpractice are numerous. The most common main mistakes had occurred outside of operating rooms (89%) and were due to orthopaedic treatment in 67% of cases. We noted 3 cases of death related with general complications (thrombo-embolism, traumatic choc). This case series demonstrates that medical errors can be dramatic for the patients and family. Graduate medical education reform should focus on strengthening these aspects of training which can be an important factor for decreasing this phenomenon.

Keywords: Misdiagnosis, Malpractice, Sequelae, Traumatology

INTRODUCTION

Medical errors are very often in our decades and source of conflict in the relationship between patient and practitioner. Surgical specialties have a higher risk of errors and adverse events as represented in literature.¹ Analysis shows that orthopedics is the specialty with the highest risk of misdiagnosis and malpractice claims.² The main type errors are diagnostic, treatment, communication, evaluation, environmental or system-related problems.³ They result from various components: human, technological, organizational, procedural and cultural. Diagnostic and treatment errors are most

common. In a context of diagnostic errors, the more important are delayed diagnosis, missed or wrong diagnosis (failure to prescribe or incorrect interpretation of diagnostic tests). For treatment errors, it includes treatment delay, incorrect surgical technique, treatment failure, unnecessary treatment and improper surgical wound care. In Senegal, with the advent of social networks, these medical errors arouse more and more interest among our populations and degrade the doctor-patient relationship to the point of seeing more and more legal overtones.⁴ Prevention of these errors is based on improving organizational capacities, training of personnel (by surgical simulation) and ethics cultivation. The aim of this work is to investigate misdiagnosis and malpractice in a

teaching university hospital and examine the principles that will improve on the quality of patient care and reduce the incidence of orthopedic cases.

CASE SERIES

From January 2019 to December 2024, a retrospective, observational, single-center study found thirteen (13) patients who present major consequences resulting from misdiagnosis and malpractice. Authors used the emergency and operating room registers and collected information on the following aspects. Injury information circumstances, mechanism, injury site, pathological type. Main site errors: intake from emergency department or external consultation, hospitalization, operative room. Medical errors were classified in diagnostic errors: delayed diagnosis, missed diagnosis. Treatment errors: treatment delay, incorrect surgical technique, treatment failure, unnecessary treatment, improper surgical wound care, misevaluation of surgical indication and planning. Communication errors: verbal or written communication. Environmental or system-related problems: poor environmental safety, inadequate resources. The results were analyzed using statistical package for the Social Sciences (SPSS) version 26.0 and Microsoft Excel 2016.

Inclusion criteria

All patients with a diagnostic error and/or a technical error (surgical, orthopedic) were included in our series.

Exclusion criteria

Patients with surgical site infection, polytraumatism and patients with minor sequelae were excluded.

Injury information and main site errors

The average age of the patients was 43.5 years. Majority of patients were relatively young and practiced professional activities. There were more men than women (85%) in the study. 92% of medical errors were linked to an initial admission to the emergency department. Eleven (11) of the adverse events had occurred in emergency care and just 2 cases in an operative room. The most frequent degree of responsibility was secondary. They involved residents in training in 46%. Only 2 cases involved the surgical team. Traumatic injuries were most frequent (84,61%), including 10 cases of fractures and 1 case of dislocation. They were all closed. The circumstances of traumatism were dominated by road traffic accident (69%) and domestic accident (23%). One patient presented an orthopedic pathology, namely chronic osteomyelitis. In this study, the most common anatomical sites affected was the femur (Figure 1). The main type errors are diagnostic, treatment, communication, evaluation, environmental and system-related problems. They could be associated or not. The distribution and description of bone and/or soft tissue lesions according to the anatomical site and type of medical errors is represented in Table 1.

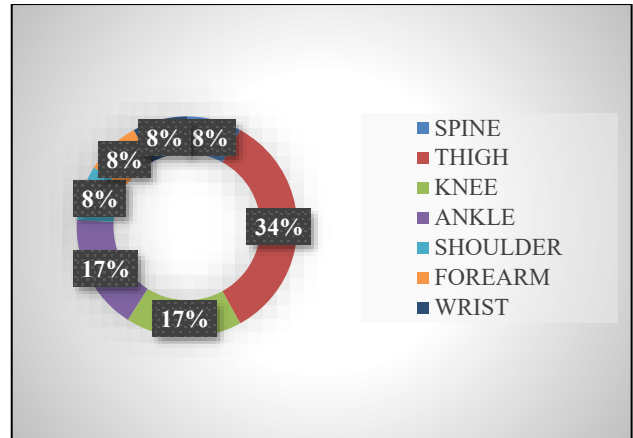


Figure 1: Anatomical site errors representation.



Figure 2: Misdiagnosis illustration. (A) Necrotic placard of thigh (crush syndrome), (B) spinal burst fracture associated with sternal fracture.



Figure 3: Malpractice illustration. (A) Compartment syndrome with digital ischemia, (B) fasciotomy, (C) Infection after orthopaedic treatment (bimalleolar fracture), (D) debridement+external fixator.

Misdiagnosis cases

Cases of misdiagnosis were less frequent than malpractice but had serious consequences, with 1 death and 3 major amputations. Unrecognized vascular injuries remained the most common cause. They affected the thigh more and traumatic injuries were diverse and varied. Some were commonly seen in daily trauma care and were simply due to a lack of clinical examination. However, some were rare, such as proximal tibio-fibular dislocation with vascular injury. They all involved the resident. The repartition and illustration of misdiagnosis type is represented in Table 3 and Figure 2.

Malpractice cases

The causes of malpractice are numerous (Table 3). Lower limb injury had a relatively high frequency (66,67%). The

most common main mistakes had occurred outside of operating rooms (89%) and were due to orthopaedic treatment in 67% of cases. Three cases of compartment syndrome were noted and one of them have induced physical consequence (forearm amputation). We noted 1 case of general complication (thromboembolism post femoral fracture). Another case of death resulting from femoral fractures was reported also in report with a lack of management.

There was 1 case of anatomical site error that involved improper performance of procedures and failure to instruct or communicate with the patient. It was a case of sequestering multifocal osteomyelitis. Complications of orthopaedic treatment of articular fractures (bimalleolar and tibial plate) were treated by external fixator+debridement. The illustration of malpractice type is shown in Figure 3.

Table 1: Case characteristics of misdiagnosis and malpractice.

Issues	N	%
Age (in years)		
0-14	2	15
15-44	9	69
45-64	1	8
Over 65	1	8
Gender		
Male	11	85
Female	2	15
Injury causes		
Traffic accident	9	69
Domestic accident (Fall from heights)	2	15
Sport accident	1	8
Others	1	8
Injury site		
Spine	1	8
Femur	5	39
Knee	2	15
Foot and ankle	2	15
Forearm	2	15
Shoulder	1	8
Pathological types		
Fracture	9	69
Dislocation	2	15
Soft tissues injuries	1	8
Arthritis	1	8
Others (tumor, congenital malformation)	0	0
Medical errors		
Misdiagnosis	4	31
Malpractice	8	62
Combinate	1	7
Consequences		
Infection	3	23
Post traumatic deformation	1	8
Ischemia	4	31
Iatrogene fracture	1	8
Death	2	15

Table 2: Misdiagnosis type.

Misdiagnosis	Misdiagnosis type	Consequences
Vascular injury on forearm fracture	Insufficient collection of clinical examination	Forearm amputation
Proximal tibio-peroneal dislocation	Wrong diagnosis	Femoral amputation
Significant dorsal kyphosis post thoracic spine+sternal fracture	Failure to prescribe diagnosis tests	Therapeutic abstention
Closed femoral fracture with vascular troubles	Insufficient collection of clinical examination	Toe amputation
Crush Syndrome	Wrong diagnosis	Death

Table 3: Malpractice type.

Malpractice	Malpractice type	Consequences
Orthopaedic treatment bimalleolar fractures (infections)	Misevaluation of indication for surgery	Debridement Ankle Arthrodesis
Orthopaedic treatment tibial plate fractures (compartment syndrome)	Misevaluation of indication for surgery	Fasciotomy+External fixator
Femoral fractures (thromboembolism)	Delay treatment	Death
Compartment syndrome post Forearm fractures	Unnecessary treatment	Forearm Amputation
Multi-focal osteomyelitis	Communication error: Wrong limb	Esthetical
Orthopaedic treatment bimalleolar fractures (Ankle arthritis)	Misevaluation of indications for surgery	Arthrotomy+External Fixator
Humerus fracture after shoulder recidive dislocation	Treatment failure	Osteosynthesis
Orthopaedic treatment forearm fractures (Compartment syndrome)	Non-fulfillment of protocols (evaluation errors)	Fasciotomy
Femoral fracture	Inadequate Planning and insufficient collection of clinical examination	Death

DISCUSSION

Complications related to misdiagnosis and malpractice are most often analyzed singularly. This observational and retrospective study has its limitations. In particular, all information is depending on the adequacy of practitioner who received at first the patients and medical paper exploitation. Also, not all cases may be detected. Misdiagnosis and malpractice have serious consequences, especially if they occur in young subjects leading a socio-professional activity. This was the case in our series where the average age of our patients was 43.5 years. According to a comparable retrospective analysis of fracture-related malpractice in the United States, the average plaintiff age was 48.5±15.2 years.⁵ The frequency of lower limb injuries was comparatively high. Kohn confirmed that traumatic injuries involving the lower limb were common in our series (femur 30%), with thigh and spine injuries predominating.⁵ Numerous consequences, including death and amputation, were linked to our lesions. The majority of medical mistakes that occur in our emergency room are brought on by a failure to keep an eye on a case and to instruct or interact with the patient. Indeed, traumatologic emergency care has always been described as "the perfect storm" for a resident: an unstable patient, difficulty gathering a complete anamnesis, the need to make critical decisions quickly, the convergence of various specialized

skills, the need for multiple treatments at once and overcrowding.^{6,7} These errors all happened during the patient's first contact with care system and therefore involved these residents in training who were in the front of the line. Our meeting matinal for the reassessment of patients was not always enough to redress these cases and pose the problem of the management of guards in the emergency room so much demanded by our local political authorities. In any case, medical responsibility was fully shared. In the others studies 8, they found also that the majority of these medical errors occurred in first contact of patient in the emergency room. Their degree of responsibility was secondary (orthopedic resident). In a few cases, our medical errors included directing the surgeon and occurred in the operative room. Traumatology is an X-ray-dependent specialty. According to Guly, the most frequent mistake in radiography was a missed diagnosis, which was frequently caused by inadequate instruction and bad interpretation.⁹ The causes in our series were numerous and touched a lot of on the clinical reasoning of our residents who is a crucial skill in medical education of students. Otherwise, we had deemed lesions like proximal tibio-peroneal dislocation, whose consequences may be poorly appreciated by a resident (potential risk of vascular injury).¹⁰ The anatomical complexity of knee one must always consider hidden soft tissue and bone trauma and follow up has to be provided.

The cases of malpractice were also not negligible. Fractures were reported in 89% of cases and was often linked to the orthopaedic treatment. Therapeutic indications were debatable to a common extent. A preference of orthopaedic treatment in certain varieties of bimalleolar fractures predisposes to an increased risk of cast complications given their frequency in daily traumatology.¹¹

Their complications are not inherent to the fracture exclusively. Correction gypsotomy and lack of cast monitoring are added factors. Conversely, some fractures have all surgical sentences except major contraindication (tibial plate fractures schatzker 6).¹² The entire study age of our population was affected by this kind medical error. They have caused major orthopedic sequelae.

In our pediatric population, most of the errors that led to pay claims were related to errors in treatment/management especially casting with a failure to recognize a complication (compartment syndrome). This is similar to the studies of Atrey and Burn.^{13,14} Anatomical site errors involved directly the surgeon in a clinical context of multifocal osteomyelitis. This type of error is not so rare and the risk of making an anatomical site error in an orthopedist's professional career is non-negligible.¹⁵⁻¹⁷

They can be prevented by implementing preoperative checklist and marking the site with ink resistant to aseptic procedures.^{15,18} Death resulting from orthopedic malpractice was rare and dramatic. Casali noted 6 cases of death.¹ We noted 3 cases in report with general complications (thrombo-embolism, traumatic shock). These general complications are extremely variable, but thromboembolism is the most widely involved in orthopedic risk management.¹⁹ In our case thromboembolism was a necropsy diagnostic and caused probably by default of precoce immobilization.

CONCLUSION

We must learn from our mistakes! Misdiagnosis and malpractice can be dramatic for the patients and family. In our west African country, lawsuits against orthopaedic surgeons were uncommon because of many factors (religious, ignorance and societal considerations of population) but it will be increased. Graduate medical education reform should focus on strengthening these aspects of training which can be an important factor for decreasing this phenomenon.

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