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Knee arthroplasty and lawsuits: the experience in France

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Abstract
Purpose Data regarding knee arthroplasty and lawsuit are scarce. With the expected increase in knee arthroplasty over the next 25 years, the number of claims might follow the same trend. Therefore, the most frequent causes of litigation after knee arthroplasty in France, and what is considered as malpractice by the expert, were determined.
Methods Over 8-year period, data gathered from a French private insurance company specializing in malpractice for private practitioners were analyzed. Demographics, type of knee arthroplasty, reason for claim, details of the legal procedure and the expert's decision were reviewed.
Results One hundred and five claims were processed by four jurisdictions. Most of the cases concerned primary total knee arthroplasty. Surgeons and anesthesiologists were charged in 84 and 16 % of claims, respectively. The most frequent causes of litigation were infection, neurological deficit and unsatisfactory result, whereas the most common reasons for the surgeon's liability, as stated by the expert, were delay in diagnosis or treatment of a complication, infection and technical error.
Conclusion Our findings show that frequent complications are not those which raise most of the claims. Patients sue the surgeon when the outcome of the surgery is different from what they were expecting. An unsatisfactory result, according to the patient's point of view, is the second most frequent cause of claim.
Level of evidence IV, Economic and Decision Analysis. See the Guidelines for Authors for a complete description of levels of evidence.

Keywords Knee arthroplasty · Complication · Lawsuit · Litigation

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Introduction

Total knee arthroplasty (TKA) is projected to grow by 673 % by 2030 [10]. Albeit TKA is a cost-effective procedure to restore the patient's mobility, this increase in the number of procedures might be associated with an increased number of litigations as well. This is already a trend as shown by McWilliams et al. [14]. According to their study, the number of claims after TKA has been shown to increase by 46 % between 2002 and 2010. Orthopaedic surgery is one of the most concerned specialities [15]. This is a wide specialty, and the risk is not equal for every subspecialties. As shown by Klimo et al. [9], the most common anatomic area involved in orthopaedic medical malpractice cases is the lumbar spine; however, this may have changed over the years.

With regard to joint arthroplasty, a survey conducted by McGrory et al. [13] among members of the American Association of Hip and Knee Surgeons (AAHKS) found that after 30 years of practice, the incidence of being sued is over 90 %. US junior surgeons are especially concerned as more than 50 % of the malpractice claims happen in the first decade of practice. Moreover, the authors found that years in practice

Table 1 Complications leading to litigation, rate of reoperation and liability of the surgeon depending of the cause of the claim. Overlaps are due to patients who had two complications

Cause	Number	Reoperation	Implant changed	Liability of the surgeon
Total	107			
Infection	44	44	38	8
Unsatisfactory result	17	10	8	5
Neurological deficit	17	3	1	1
Fatality	14	4	2	2
Vascular lesion	3	3	0	1
Bedsore	1	0	0	0
Periprosthetic fracture	2	2	0	1
Knee instability	2	2	2	1
Implant dislocation	2	2	2	0
Compartment syndrome	2	1	0	0
Wrong side	1	0	0	1
Extensor mechanism injuries	2	1	1	1

were the only risk factor related to a malpractice suit. Interestingly, Jarvelin et al. [6] found that patients who were over 65 years of age were less likely to file a claim whereas a 1-unit increase in the Charlson index increased the odds of a claim by 14 %. The Charlson index [3] is based on the seriousness of comorbid diseases and predicts the risk of death at 10 years.

The share of claims related to knee arthroplasty out of all claims involving orthopaedics varies depending on the country of practice. Knee arthroplasty claims represent 6 % in UK [14] and 2.5 % in Finland of all claims [6]. Likewise, the most common reason for a claim varies depending on in which country the study is performed. In the USA, the first three most common reasons for a claim after total joint replacement (TJR) are as follows: nerve injury, limb-length discrepancy and infection [13, 18]. However, no difference is made between hip and knee in those studies. In the UK, the first three most common reasons after TKA are as follows: infection, technical error—component and alleged negligence [14]. Little is known about the reasons that push the patient to sue the surgeon after knee arthroplasty. The aim of the study was to elucidate the causes of lawsuits and their consequences after knee arthroplasty in France.

Materials and methods

We analyzed data provided by a French private insurance (MACSF, «Mutuelle d'Assurance du Corps de Santé Français» = Cooperative union for the Body of French Health) firm specializing in medical malpractice issues for private practitioners in France. This company provides legal assistance to its members. The claims related only to knee arthroplasty and classed cases in order to assess relevant data were asked. Patient demographics, type of knee arthroplasty and reason for claim (non-surgical complications were excluded except those that led to death) were gathered. Time between surgery and claim and, when applicable the treatment performed to fix the reason that led to the litigation were also recorded. Moreover, for each case, the physician blamed, details of the legal procedure and the charge ultimately decided by the expert were scrutinized.

Results

From 2001 to 2009, 105 claims of knee arthroplasty were subject to litigation, which represents 100 patients as ten cases involved two physicians. The mean age of the patients was 64.7 years (SD 11.1, range 35–90). There were 54 women and 46 men. The majority of the arthroplasties were primary TKA (81), followed by uni (11), revision TKA (7) and 1 desarthrodesis (1). Among the claims, 88 orthopaedic surgeons were involved whereas anesthesiologists were involved in 17 cases. The mean age of the surgeon at the time of the litigation was 49.3 years (SD 6.9, range 35–63).

One hundred and seven complications led to a claim as 93 patients had one complication and seven patients had two complications. Infection, neurological deficit and unsatisfactory result were the first three causes of litigation (Table 1). Details of the complications are listed in Table 2.

Most of the infections were diagnosed and treated early (Table 3), and neurological deficits ranged from partial recovery to no recovery.

Among the physicians sued for unsatisfactory result, six of them were ultimately found to be responsible for these unsatisfactory results due to wrong indication (2), extensor mechanism injury (1), rotational malalignment of the leg (1), oversized implant (1) and lack of information (1), all ending in compensation payments.

In the end, 67 patients were reoperated on, including 51 implant changed, 13 arthrodesis and 9 amputations. Thus, when looking at arthrodesis and amputations, 22 patients

Table 2 Details of the complications leading to litigation

Complications (n =)	Details
Infection (44)	3 times associated with death All patients were reoperated on (6 amputations, 13 arthrodesis)
Neurological deficit (17)	Associated with 1 extensor mechanism injury and 2 compartment syndromes. 7 CPN, 6 FN, 3 TN, 1 three of them
Unsatisfactory result (17)	Dissatisfaction without additional complication: chronic pain (10), poor range of motion (4) and CRPS (3)
Fatality (14)	Following 3 infections and 1 vascular injury Otherwise due to medical conditions (PE, MI, EH)
Vascular injury (3)	1 femoral and 2 popliteal thrombosis 3 amputations, 1 death
Bedsore (1)	Located at the heel
Periprosthetic fracture (2)	Both supracondylar 1 after a fall, 1 after mobilization under general anesthesia 1 associated with extensor mechanism injury
Knee instability (2)	1 due to excessive posterior slop of the tibial plateau (15°)
Implant dislocation (2)	1 in uni and 1 in TKA
Compartment syndrome (2)	In each case associated with a neurological injury
Wrong side (1)	In a case of a uni
Extensor mechanism injury (2)	1 after mobilization under general anesthesia 1 found intraoperatively

As seven patients had two complications, some of them overlap

PE pulmonary embolism, *MI* myocardial infarction, *EH* epidural hematoma, *CRPS* complex regional pain syndrome, *CPN* common peroneal nerve, *FN* femoral nerve, *TN* tibial nerve

Table 3 Details of the complication "infection"

	Onset		Grade		Time until diagnosis		Time until treatment	
	Early	Late	Low	High	Early	Late	Early	Late
Onset								
Early	23	X	6	17	22	1	20	3
Late	X	21	0	21	19	2	19	2
Grade								
Low			X	X	6	0	6	0
High			X	X	35	3	33	5
Time until diagnosis								
Early					X	X	39	2
Late					X	X	0	3
Time until treatment								
Early							X	X
Late							X	X

Early onset is within 1 month after the procedure. High grade is a deep infection that led to, at least, an implant changed. An early diagnosis is within 1 week from the occurrence of the complication. An early treatment is within 1 week from the diagnosis

have an outcome very far from the expected outcome of the index surgery.

The time between the operation and the claim ranged from a few months to 10 years. Eighty-three claims were raised <2 years after the operation.

The legal procedure was carried out through the arbitration and compensation regional board (independent jurisdiction) in 41 claims, through the civil court in 40 claims, through out-of-court settlement in 19 claims and in 5 claims through the criminal court.

In the end, the different jurisdictions led to a liability involved in 41 claims. Among them, the personal liability of the surgeon was involved in 19 claims and that of the anesthesiologist's in one claim (Table 4). The 21 remainders involved the clinic. The highest rates of successful claims were for wrong side, bedsore and extensor mechanism injury (Table 5).

Discussion

The most important finding of the present study was that the three most frequent causes of claim after knee arthroplasty in France are as follows: infection, neurological

Table 4 Charges ultimately decided on by the expert

Charges against the surgeon: 19	Charge against the anesthesiologist: 1
7 delays in the treatment of a complication:	1 delay in the treatment of a complication (death following pulmonary embolism)
3 infections	
2 deaths	
1 implant dislocation	
1 extensor mechanism injury	
4 for infection	Charges against the clinic: 21
3 technical errors:	17 for infection
1 oversized implants	2 for neurological deficit
1 rotational malalignment	1 for death
1 extensor mechanism injury	1 for bedsore
3 wrong indications	
1 lack of information	
1 for wrong side	

One hundred and five cases were brought to a court

Table 5 Correlation between the reason for claim and the number of successful claim, respectively

Claim: total	Number of successful claims
Infection: 44	24
Neurological deficit: 17	2
Unsatisfactory result: 17	6
Fatality: 14	4
Implant dislocation: 2	1
Extensor mechanism injury: 2	2
Bedsore: 1	1
Wrong side: 1	1

deficit and unsatisfactory result. Furthermore, our results highlight that among the 105 claims initially directed against a physician, only 20 were actually successful (19 surgeons and 1 anesthesiologist lost the trial).

As in many country of southern Europe, the French legal system is a legacy of the Roman law (also called civil law) whereas Anglo-Saxon countries have a legal system that comes from the British Empire [17]. This makes some differences regarding the legal procedure between those countries. Thus, in France, the judge often seeks and names an expert to answer the technical surgical questions raised in the case. The prosecutor is present only in the criminal court. In the civil court, the judge, assisted by the medical expert, makes the decision. On the arbitration and compensation board, the board makes the decision. In the out-of-court settlement, the two sides discuss with each other in order to find a solution, and if this process fails, the claim is brought to the court. The expert is being defined as a physician who makes authority in his/her field. The medical expert has access to the entire chart to make a decision. Regarding knee replacements, we are not aware of any case where the expert asked to see the navigation report when the procedure was performed through computer-assisted surgery. Nevertheless, this might happen in the future.

Being involved in litigation after TKA is an unpleasant and painful experience for a surgeon. Orthopaedic surgeons are especially a concern as they are usually in the top five specialties that raise the most claims [5, 16]. Junior orthopaedic surgeons starting their career should be aware that the odds of being sued after TKA are higher during this time.

Interestingly, the most frequent reasons for knee revision do not match accurately the most common causes of litigation. As shown by Bozic et al. [2], the three most common reasons for knee revision in the USA are infection, mechanical loosening and implant failure/breakage. In the Netherlands [19], those reasons are septic loosening, aseptic loosening and component malposition. In Japan [8], patients are more frequently revised for mechanical loosening, infection and wear/osteolysis. Therefore, the only reason always found both in the top three reasons for revision and in the first three causes of lawsuit is infection. This is true again when looking at the reasons for non-revision reoperation after TKA, as shown by Zmistowski et al. [20], where the first three causes are arthrofibrosis, patellar clunk syndrome and infection. Thus, the definition of a complication is not unanimous, and the patient and the surgeon may assess the feeling of "abnormal" postoperative course differently. The analysis of the complications after knee replacement according to a medical–legal procedure is therefore of interest: It shows complications that are severe enough according to the patient to start a legal procedure.

Our study was limited by a number of factors. Firstly, the data originate from a single French insurance company specializing in private practice: This may not be representative of the society as a whole and of the surgeons practice as well. Moreover, once the surgeon has been judged innocent, the claimant can still sue the industry, the clinic or

another physician without keeping the insurance company informed. Secondly, patients can make an appeal against the court's decision or start another procedure through a different jurisdiction several years later. This could lead to a loss of data. Thus, the liability of the surgeon was limited to what is known at the time of the study. Thirdly, our data might be slightly different than those in general hospitals/non private practice as the patients have usually more comorbidities in those hospitals.

McWilliams et al. [14] reported results that were slightly different than ours. Infection remains the first cause of litigation after TKA, as for hip replacement in France [11]. McWilliams reports technical error and alleged negligence, whereas we report neurological deficit and unsatisfactory result. However, previous studies have found nerve injury to be the most reported claim [18], similarly for claims for hip replacement [11]. Surprisingly, unsatisfactory result ranked equal second among the causes of litigation in our study. This result conveys greater expectations of the benefit of the knee replacement. Indeed, our definition of unsatisfactory result was claims related to non-specific disturbance of the knee, limiting patients' daily activities (chronic pain, poor range of motion and complex regional pain syndrome). Furthermore, it means also that the preoperative information was not sufficient and that the surgeon should endeavor to decrease the patient's expectations when they are too high. The surgeon should insist on the fact that a knee replacement is not a miraculous operation and that a few patients might remain in pain or might have a poor range of motion after the procedure. Moreover, our study contributes new data to what the surgeon is ultimately judged personally responsible for. Thus, we show that although infection is the first cause of litigation, ultimately the surgeon is more often judged responsible for a delay in diagnosis or treatment of a complication whatever this complication may be. A complication can be classified in three stages: occurrence, detection and management. Negligence in the detection and in the management of a complication is highlighted, in our study, more prominently than negligence in the occurrence. The clinical relevance of this study is that, when a complication occurs, early and adapted care [1, 4, 12], efficient communication as well as honesty and integrity from the surgeon would prevent the patient to mount a claim [7, 11]. The patient's view and the surgeon's view in regard to the risk on which the patient demands information were shown to be different in our study. The frequency of a complication matters less for the patient than the severity of the disability that follows the complication, especially if this disability is far from the one that initially brought the patient to the surgeon. It is the burden of the consequences of the sequelae from surgery that motivates the patient to mount a claim. Finally, as shown by Attarian et al. [1], by observing guidelines, these odds can be decreased, if not suppressed. These guidelines can be divided into four main commitments, which define the "standard of care" that every surgeon should know: "knowledge of the procedure, competence in performance, carefulness in preoperative evaluation and diagnosis, diligence in patience treatment including informed consent, surgery, postoperative care and complication." Moreover, Attarian et al. insist that any complication should be documented with short- and long-term follow-up plans communicated to the patient. Application of these guidelines should prevent lawsuits.

Conclusion

Delay in diagnosis or treatment of a complication involves the personal responsibility of the surgeon, and this is what the expert states most of the time. Therefore, the best practice in handling complications or errors in knee arthroplasty is to quickly recognize and to treat them properly as well as to provide the patient comprehensible information.

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