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Operating theatre photography for personal injury cases

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Photography, including records taken in theatre, has an important role to play in the legal settlement of personal injury claims. Photographs taken immediately prior to an operation in the anaesthetic room or during the operation provide valuable evidence for civil litigation. The type of operations at which personal injury photographs should be taken range from emergency surgery and minor operations to exploratory or reparative surgery. The value of pre-operative photography is demonstrated in two examples of orthopaedic surgery for personal injury claims.

Introduction

The idea of using photography in theatre for personal injury cases is not recent; in 1955 Averbach[1] recommended that:

> 'when a trial lawyer knows in advance that a client, while a patient in hospital is scheduled for a . . . open reduction in the orthopaedic field or plastic surgery procedure, that arrangements should be made . . . to requisition full medical photography in the case.'

Recent authors have emphasised the role of photography to demonstrate residual scarring[2] and others have highlighted the need for alternative means of obtaining relevant information and higher quality records.[3] Photographs are a regular part of theatre records for teaching and clinical purposes, supplementing written operation notes, but their medico-legal use has been neglected.

This paper examines the importance of theatre photography in two cases of injury to the knee joint and discusses how these can provide additional information to assist in the settlement of a personal injury claim.

Anatomy of the knee joint

The knee joint is viewed as three joints in one, tri-compartmental unit, the lateral and medial compartments of the femur and tibia together and the patellofemoral joint. The medial tibial plateau is less circular than the lateral with the semi-lunar cartilages or menisci attached. The lateral meniscus can shift out of the way, being more mobile, with the medial bearing the brunt of injuries and often splitting or tearing.

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The cruciate ligaments located between the lateral and medial femoral condyles, in the intercondylar notch, are important for stability. Their name derives from the latin 'cruciatus' – cross-shaped. Their roles in stabilizing the joint can be remembered by useful mnemonics; the anterior cruciate ligament (ACL) – ALE, anterior passes posteriorly to the lateral side and is tense in extension, the posterior cruciate ligament (PCL) – PMF, posterior passes anteriorly to the medial side and is tense in flexion. The lateral and medial constraints are the lateral collateral ligament (LCL) and medial collateral ligament (MCL).

Figure 1 shows the major anatomical features considered in this paper. Detailed information can be found in

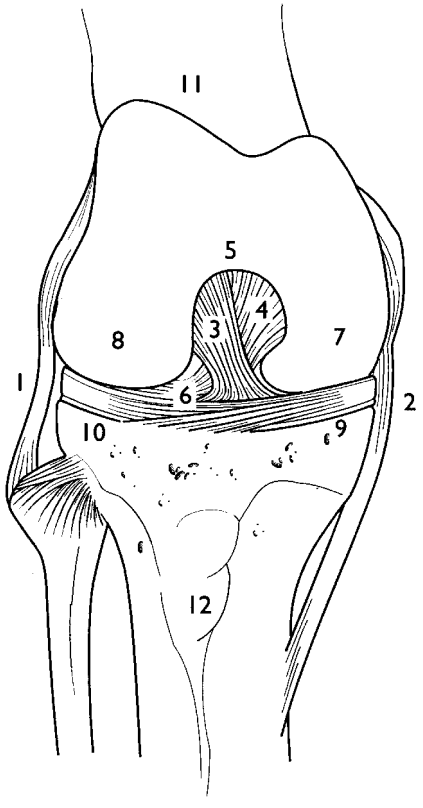

Figure 1 *Anatomy of the knee joint. 1 – lateral collateral ligament, 2 – medial collateral ligament, 3 – anterior cruciate ligament, 4 – posterior cruciate ligament, 5 – intercondylar notch, 6 – tibial plateau, 7 – medial femoral condyle, 8 – lateral femoral condyle, 9 – medial meniscus, 10 – lateral meniscus, 11 – femur, 12 – tibial spine*

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anatomy texts, for example Marieb's *Human Anatomy and Physiology*.[4]

Case studies

Case 1 – knee instability

A 16 year-old girl was involved in a road traffic accident (RTA) as a pillion passenger on a motorcycle which collided with a Range Rover resulting in injuries to her right hip and knee.

Consultant's medico-legal report (2 years 4 months after accident): Findings following clinical examination, Isokinetic assessment, X-rays, Magnetic Resonance Imaging (MRI) and Computerised Tomography (CT) showed a complex picture of a range of knee problems, see Table 1. The prognosis at this time was that there would be no improvement without further surgical procedures. There would be an increase of her symptoms of pain and swelling (>90% chance) and she may well need an arthrodesis or total knee replacement before the age of forty.

Reparative operation (4 years 3 months after accident): Examination under anaesthetic (EUA) demonstrated a valgus deformity,[5,6] see *Figure 2a*, of about 20° under stress and little varus deviation, *Figure 2b*. The patient had previously shown a tendency to stand or walk in varus to prevent the knee giving way. Anterior drawer and posterior sag tests indicated cruciate ligament insufficiency.

Table 1 Range of knee problems suspected preoperatively in case 1

Patella alta
Joint movement
Fixed flexion deformity 10°
Valgus 10°
Lack full extension 10°
Weakness quadriceps muscle
Posterior cruciate ligament (PCL) insufficiency
Anterior cruciate ligament (ACL) incompetent
Almost complete destruction of bone of the upper tibia and lateral tibial compartment
Damaged meniscii
Lateral bound to scar tissue
Medial tear of posterior 1/3.

Diagnostic arthroscopy revealed an intact but incompetent ACL, *Figure 3*, and an intact PCL. The major finding was a large compression fracture of the tibial plateau together with loss of most of the lateral meniscus, *Figure 4*. The endoscopy was followed by an operation to reinsert the patella tendon into the tibial spine, *Figure 5*, correcting the patella alta (high patella) seen in the clinic pre-operatively, *Figure 6*.

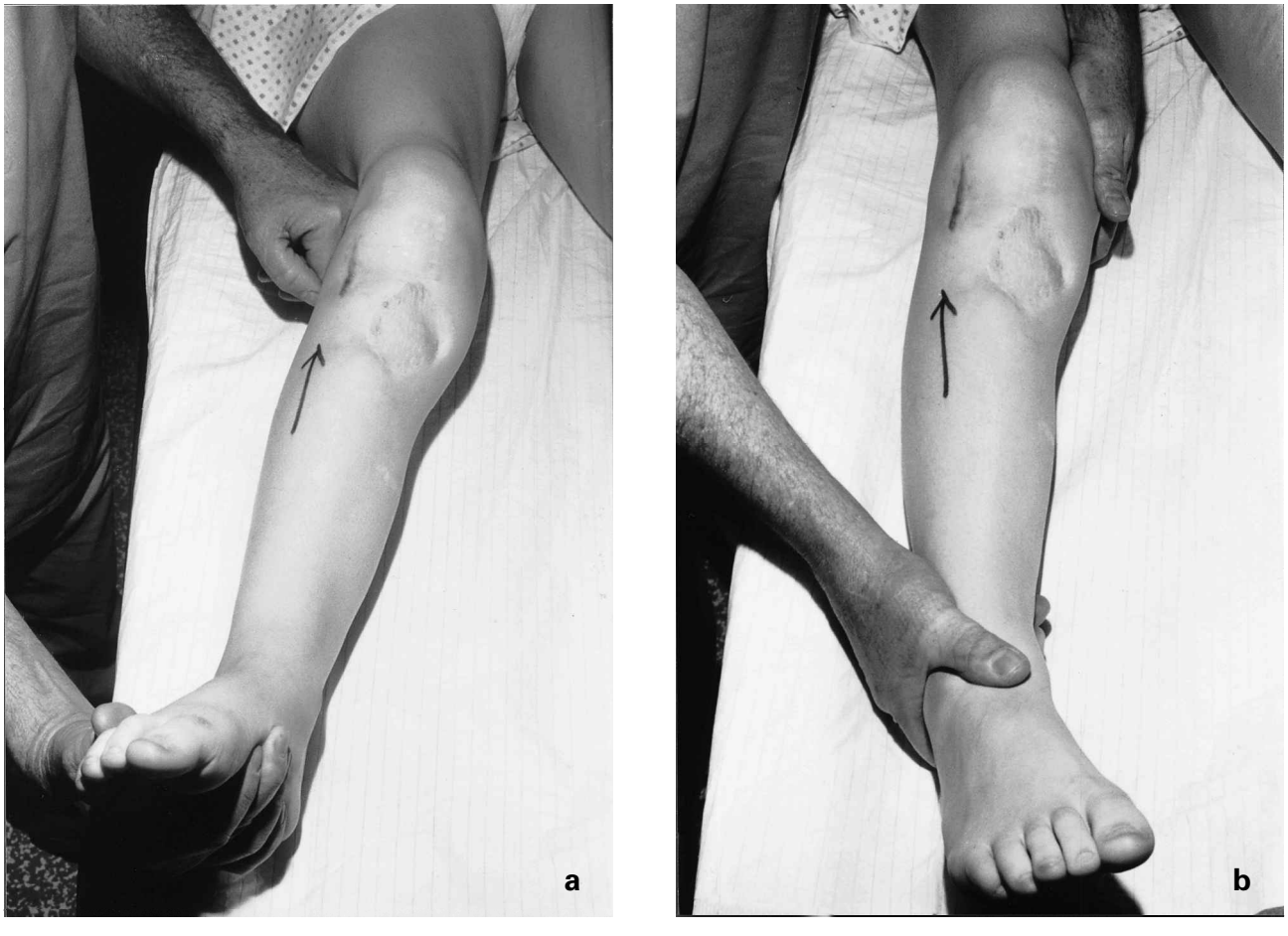

Figure 2 *Examination under anaesthesia, (a) valgus stress, (b) varus stress*

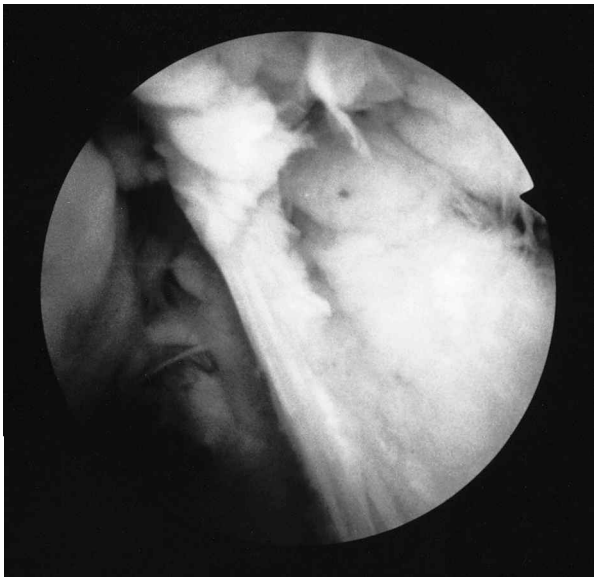

Figure 3 *Intact but incompetent anterior cruciate ligament within intercondylar notch*

Case 2 – Fixed flexion deformity right knee

A twenty-four year-old man was knocked off his motorcycle by a tractor turning unexpectedly across his path into a concealed entrance. He suffered multiple injuries including head injuries.

Injuries included a compound fracture of the left tibia and fibula, a fractured shaft of the left femur, severe disruption of the right medial femoral condyle with massive cartilage loss. Knee ligaments appeared to be intact. Reconstruction of the articular surface of the right knee was achieved with several screws though the joint was severely disorganized.

Reparative operation (13 months after accident): The client was left with a fixed flexion deformity of the right leg requiring surgical intervention. The pre-operative photographic record shows the right leg with a 20° lack of extension, *Figure 7a*, and 45° of flexion, compared to 140° flexion in his left leg, *Figure 7b* (see also Table 2).

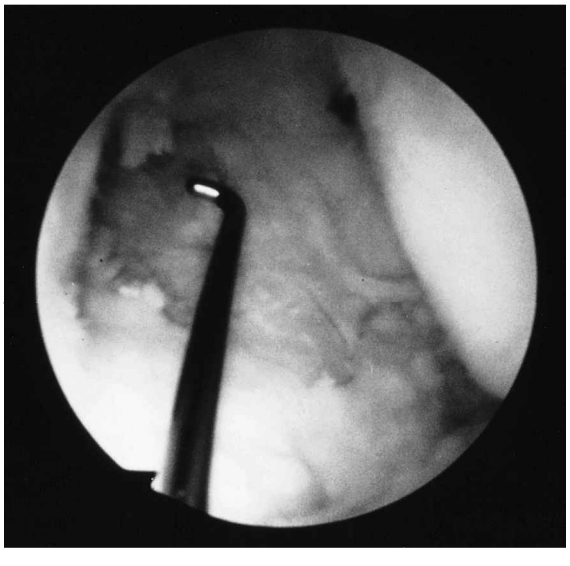

Figure 4 *Depression of lateral tibial plateau indicated with a probe*

Figure 5 *Operative field for reinsertion of the patella tendon. Operation undertaken with tourniquet*

To achieve a full demonstration of extension for photography it is necessary to have the leg showing the greatest lack of extension nearest the camera and for the heels to be held level raised above the surface with muscles relaxed. This ensures full extension and enables the extension of the further leg to be seen, *Figure 7a*. Hands were permitted to be seen in a medico-legal photographic record in the USA in 1943.[7]

No further flexion or any indication of the state of the ligaments was achievable with EUA. Operatively, without a tourniquet, the knee showed considerable adhesions and a very poor joint surface of the femoral condyle and medial tibial plateau, *Figure 8a*. The superior attachment of the anterior cruciate ligament was torn.

The operation proceeded to a total knee replacement (TKR), there was evidence of a cyst in the lateral femoral condyle and osteonecrosis of the medial femoral condyle after removing bone for placement of the prosthesis, *Figure 8b*.

After placement of the femoral and tibial components of the prosthesis the knee joint was tested for collateral

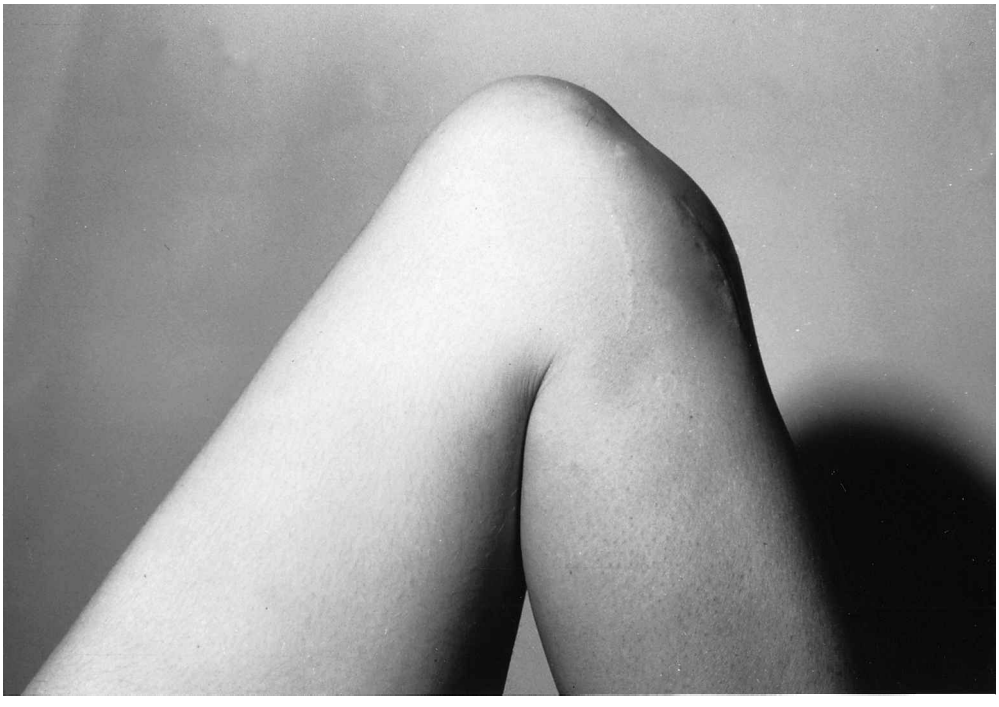

Figure 6 *Patella alta seen in clinic pre-operatively*

stability and the lateral restraints were found to be incompetent on varus stress, *Figure 9*. On exploration it was found that the superior bony attachment of the lateral collateral ligament was detached. This was repaired using a Surgicraft ABC carbon fibre/polyester tow.

Discussion

Value as evidence

Photographic records provide evidence of the injuries which can be used to ascertain the extent of damage to the individual and elucidate the quantum financially.[8]

Munkman[9] states that damages arising from injuries should be assessed by looking at how the injuries:

- Create needs that would otherwise not exist
- Destroy or diminish, permanently or for a time, an existing capacity; mental or physical
- Produce pain and suffering

Photographs taken in theatre provide extra information beyond that obtainable pre-operatively by:

Table 2 Pre-operative range of knee joint motion in case 2

	Right	Left
Extension	20°	0°
Flexion	45°	140°
Range of joint flexion	25°	140°

1. *Recording the full extent of joint motion:* When an EUA is undertaken a muscle relaxant can be used so the joint can be fully assessed without muscle spasm or causing the patient pain, *Figures 2a and b*.

2. *Recording internal damage not visible prior to surgery:* The problem perceived pre-operatively was greater than was revealed arthroscopically in case 1 and in case 2 the torn lateral collateral ligament was not seen until after the TKR had been inserted and the lateral and medial constraints tested. The photographs help relate the perceived disability or handicap pre-operatively to the actual condition or injury at operation and help establish the primary cause of instability. Bunker,[10] comments that; 'surgical intervention itself changes the prognosis and adds to our knowledge'.

3. *Recording the type of injuries sustained:* In case 1 the major cause of joint instability was the compression fracture of the tibial plateau which resulted in joint surface depression, rather than ligament rupture, coupled with the tearing of the patella tendon. The forces which caused the fracture were compressive rather than distractive. In contrast the forces involved in the accident in case 2 were distractive to the lateral compartment and compressive to the medial compartment.

Evidence which helps determine the injury mechanism can be used to establish blame or the ratio of liability between parties if individual accounts of the accident do not agree.

Cornes and Bochel[3] stress the importance of increasing the value of information available for personal injury cases;

> 'improved standards of reporting and alternative means of obtaining relevant information would not

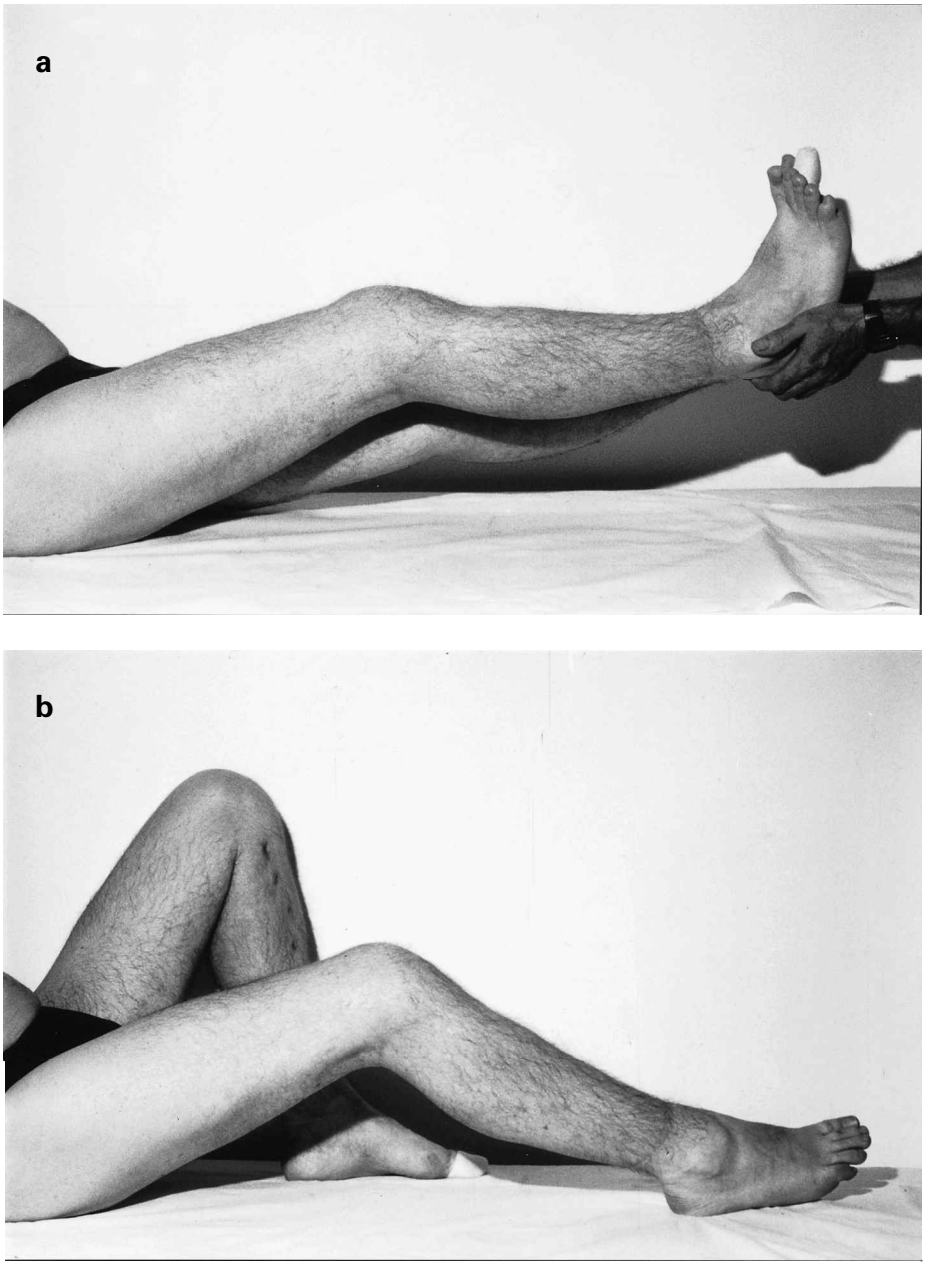

Figure 7 *Pre-operative range of joint motion, (a) left full extension, right 20° lack, (b) flexion to 45° right leg compared to 140° left*

only enhance decision making in individual cases but also provide a foundation for more effective management of claims and underwriting'.

Photography in the operating theatre can legitimately claim to be one of those 'means of obtaining relevant information'.

Prognosis

What is a prognosis? At its simplest it is 'a forecast of the course of a disease'.[11] The delineation of a prognosis through assessment, medical examination and operation leads to an accurate quantification of future costs which are then allowed for in the calculation of compensation. The root of the word compensation is from 'compensare' meaning 'weigh together' and the courts' aim is to balance the loss against the compensation, it is not intended as a reward.[9]

Few prognoses in the field of personal injury can be absolute so the consultant, lawyers and insurance companies end up using probabilities, the likelihood of a condition resolving or deteriorating. It is possible once the outcome is known, after any reparative operations, rehabilitation or time for the injury to settle, to say that the likelihood of the client needing a TKR is, for example, 25% or 75% and the compensation can be varied accordingly.

The prognosis for the compression fracture injury from case 1 is directly correlated with the depth of depression,[12] see Table 3. The depth of depression seen at arthroscopy,

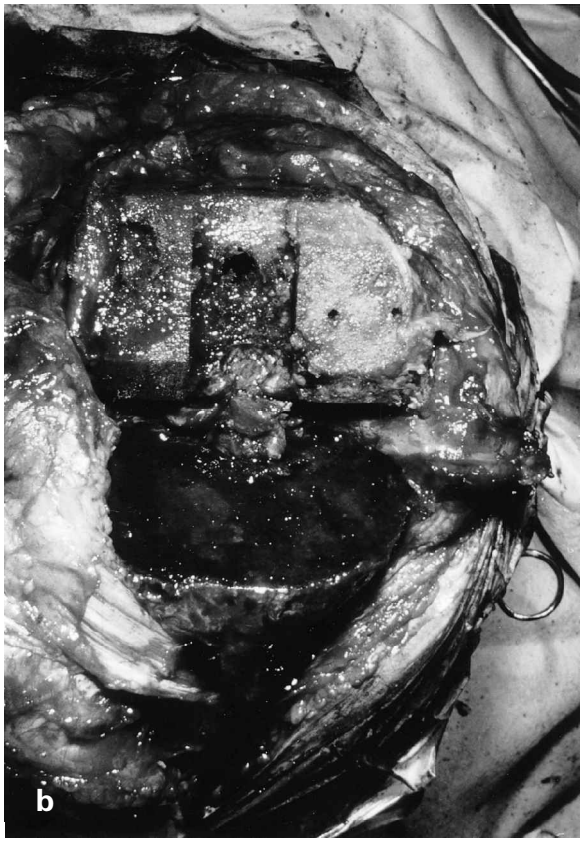

Figure 8 *Operative records of right knee joint, operation without a tourniquet in place, (a) adhesions and poor joint surfaces femoral condyle and tibial plateau, (b) after removal of bone ready for placement of prosthesis; note bone cyst lateral femoral condyle and osteonecrosis medial femoral condyle*

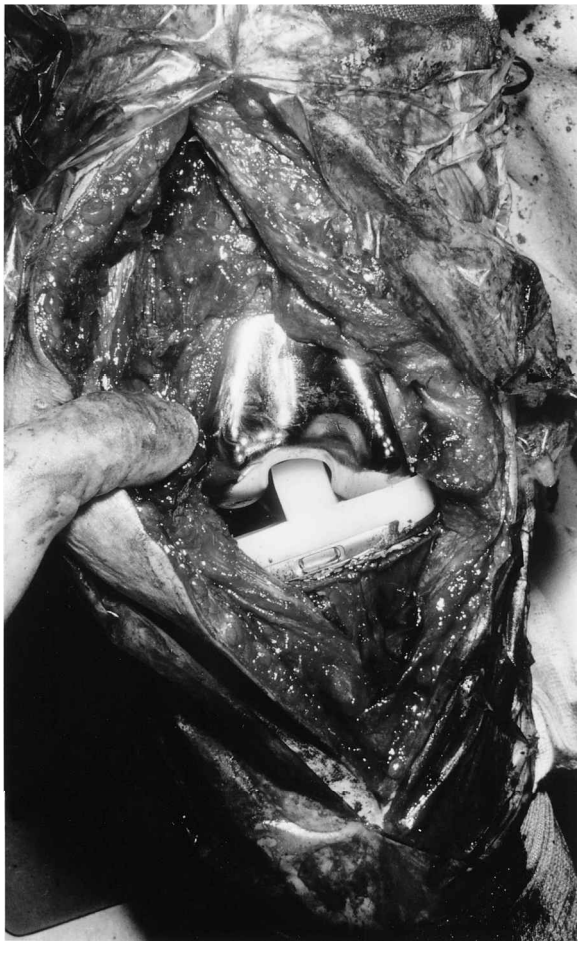

Figure 9 *Varus stress with prosthesis in place showing lack of lateral restraints*

Figure 4, was at the upper end with 55% chance of an acceptable result exacerbated by the loss of the anterior part of the lateral meniscus.

The possibility of osteoarthritis in the joint also has to be taken into account in case 1. Table 4 shows the incidence of osteoarthritis following tibial plateau fracture related to the functional outcome.[13] Following a post-operative assessment the overall risk of osteoarthritis and the future requirement for a TKR can be allowed for financially.

Similarly in case 2 the state of the patient's bone stock indicates that a second TKR or further surgery would probably be necessary. So the need for a subsequent TKR or operation following eventual mechanical failure or loosening

Table 3 Percentage acceptable results related to depth of depression of tibial plateau taken from a review of 68 patients, 3–13 years after accident (after Porter[12])

Depth of depression (mm)	Acceptable
< 10	96%
10–14	71%
> 14	55%

Table 4 Patients developing osteoarthritis (OA) following tibial plateau fractures in a follow-up study of 204 patients, 4–11 years after injury (after Rasmussen[13])

Functional end result	OA %
Acceptable	14
Unacceptable	62
Residual angulation	**OA %**
Normal	13
Valgus < 10°	19
Valgus > 10°	56
Varus < 10°	70
Varus > 10°	100
Condyles	**OA %**
Bicondylar	42
Medial	21
Lateral	16
Stability	**OA %**
Stable	18
Unstable in 20° flexion	14
Unstable in extension	46

of the femoral component needs to be allowed for in calculating the damages.

Photographs taken operatively help provide an evidential basis for the prognosis and may affect the percentage compensation agreed for the future needs of the client. They can also help a client avoid being labelled as having 'compensationitis' or 'malingering' which Woodyard[14] considered directly related to the prognosis. The chance of serious deterioration and disease may also affect the solicitor's decision whether to ask for provisional damages.[15,16]

Aversion to operative photographs

The attitudes of solicitors towards photographs for personal injury varies from those who want pictures to look 'as gory as possible' with the likely loss of objectivity, to the more common aversion to clinical photographs. Some are not keen on non-operative photographs let alone those showing open operations and they would rather not see or dwell on the photographs. So, as I have personally observed, they are turned over or rapidly placed back in a file out of sight.

Genn's survey[17] noted a lack of medical knowledge and fear of medical matters in general. The lawyer with a weaker stomach has possibly gone into civil law to avoid the criminal side and the accompanying forensic photographs.

Not using a tourniquet can be important to demonstrate avascular necrosis as with the medial femoral condyle in case 2 but comparing *Figure 5* with a tourniquet and *Figure 7b* without there is a significant difference in the records, especially in colour.

The general public is becoming accustomed to 'gory' evidence but it is important that the presentation is correct once the material has left our hands; knowledge and understanding of medical matters is not universal and some photographs can have a significant emotional impact.[18]

Coordination of photography with operation

Most operations of a reparative nature are elective and usually arranged well in advance, although the photographer may not be told until the day before. Once a repair has been undertaken you cannot go back and photograph the injury again as may be possible with an autopsy.

Close coordination between the solicitor, consultant and personal injury photographer is important so that there is time to take any pre-operative photographs that may be needed and to get the necessary instructions from the solicitor.[8] There is nothing worse than to be instructed to take photographs only to discover that the consultant has already gone ahead with the operation.

The use of photography by solicitors has been neglected despite strong comments from earlier writers. Averbach[1] in1955:

> 'Logically it would seem that an attorney is guilty of professional laxity when he fails to have photographs prepared which are necessary to the proper presentment of the evidence'

and Scott[7] commenting in 1946:

> '. . . there is no doubt that few medicolegal cases will go to trial without being illustrated by properly prepared photographs.'

Whether this has truly come to fruition is debatable.

Conclusion

Photography in theatre should be an integral part of a personal injury photographic service to provide essential evidence towards an equitable settlement for the client, supplementing the traditional photographs after final examination and medical reports have been completed.

Theatre photographs are as vital to personal injury claims as photographic records of autopsy findings are for forensic medicine.

Acknowledgements

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cases are a small part of a larger series of pre-operative and operative records taken as colour slides.

References

1. Averbach A. Medical photography as a boon to trial lawyers. *J Biol Photogr Assoc* 1955; **23**: 110–2.
2. Smith DR. *Personal Injury Claims – Obtaining and Using Medical Evidence*. 2nd edn Edinburgh: Rehabilitation Studies Unit, 1993.
3. Cornes P, Bochel H. Do medicolegal reports meet insurers' requirements? *The Post Magazine and Insurance Monitor* 1985; **Aug 1st**: 2035–7.
4. Marieb E. *Human Anatomy & Physiology*. Harlow: Benjamin/ Cummings, 1998.
5. Clarkson HM, Gilewich GB. *Musculoskeletal Assessment: Joint Range of Motion and Manual Muscle Strength*. London: Williams & Wilkins, 1989.
6. Magee DJ. *Orthopedic Physical Assessment*, 3rd edn Philadelphia: W.B.Saunders Company, 1997.
7. Scott CC. Medicolegal photography. *The Rocky Mountain Law Review* 1946; **18(3)**: 173–239.
8. Bryson D. A guide to medico-legal photography for personal injury claims. *J Audiovis Media Med* 1994; **17**: 5–11.
9. Munkman J. *Damages for Personal Injuries and Death*, 10th edn London: Butterworth & Co Ltd, 1996.
10. Bunker TD, Apthorp H. The knee. In: Foy MA, Fagg PS., eds. *Medicolegal Reporting in Orthopaedic Trauma*. London: Churchill Livingstone, 1996.
11. Fowler HW, Fowler FG (eds). *The Concise Oxford Dictionary of Current English*, 9th edn. London: OUP, 1996.
12. Porter RB. Crush fractures of the lateral tibial table. *J Bone Joint Surg* 1970; **52B**: 676–87.
13. Rasmussen PS. Tibial plateau fractures as a cause of degenerative arthritis. *Acta Orthop Scand* 1972; **43**: 566–75.
14. Woodyard JE. Diagnosis and prognosis in compensation claims. *Ann Roy Coll Surg Eng* 1982; **64**:191–4.
15. Wilkins J. Provisional damages 10 years on (1). *Solicitors J* 1996; **May 3**: 432–3.
16. Wilkins J. Provisional damages 10 years on (2). *Solicitors J* 1996; **May 10**: 449, 454.
17. Genn H. *Hard Bargaining: Out of Court Settlements in Personal Injury Actions*. Oxford: Clarendon Press, 1987.
18. Camps FE. Photography and the law. *Photogr J* 1961; **101**: 106–8.