Critical Incident Identification in Common Orthopaedic Injury

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Abstract

Objective: To identify the occurrence of any critical incidents in the 50 consecutive patients with common orthopaedic injury (distal radius fractures) treated in a District General Hospital of United Kingdom.

Methods: All patients admitted with distal radius fracture and subjected to manipulation/closed reduction under anaesthesia or surgical interventions were included in this study. Patients who were manipulated in Accident and Emergency were excluded.

Results: Although a very common fracture to treat in orthopaedic practice, a radial fracture can be associated with significant critical incidents during its management. Nineteen critical incidences in 50 patients treated for their distal radius fracture were identified. Three occurred while consultants were operating, whereas 16 took place during surgery by trainees.

Conclusion: A critical incident identification form has been formulated which can be incorporated in any procedure for training and evaluation purpose (JPMA 59:71; 2009).

Introduction

Pringle et al in 1995 described a significant (critical) incident as "Any event thought by anyone in the team to be significant in the care of the patient or the conduct of the practice".[1] Most critical incidents can be broadly categorised as an adverse occurrence, near misses or errors. These can occur in any clinical practice but can have significant effects in orthopaedic settings especially in the operating theatre environment. Variety of factors, some specific to orthopaedic, others common to all specialities, combine to create a particularly high-risk environment. Most of the critical incidents are thought to be due to of human errors, therefore the possibility of negligence causes great concern. Moreover the cost of critical incidents can also be high, not only in terms of patients suffering, but also in terms of prolonged patients stay.

Before going into the details of how critical incidents occur in clinical settings we need to look into the fact as to why critical incidents take place. It is also important to understand the circumstances that predispose to such incidents. Experiences from other professions give us an insight to the aetiology of critical incidents in the medical field. The commonest examples are increased workload, lack of knowledge, inadequate training, new or

inexperienced staff, lack of proper equipment, lack of communication among the medical staff, and absence of awareness of errors. Simple and common interventions to reduce such errors include reducing the workload related stress, providing an adequate workplace environment, concentrating on proper training and supervision of the staff, creating more awareness of the potential for errors and finally establishing a culture in which the critical incident is reported.

The aims of critical incidents reporting in medicine are to prevent the recurrence of incidents and decrease the possible morbidity and mortality. Documentation of the frequency of a particular incident we can identify the specific needs of training for the staff. Moreover the causes of the incidents can be found and long-term strategies to prevent such incidents in the future can be developed.

The National Patient safety Agency in 2003 developed a national reporting and learning system to collect and analyze patient safety incidents from local National Health Services organizations.[2] The main aim of this system is to learn lessons from our own mistakes and identify the trends in patient safety. Most of the NHS organizations use an incident form to record these incidents. This form includes basic clinical details and brief description of the incident. The data in these forms is being used mainly to manage complaints and settle any legal claims.

This article describes how critical incidents occur in the patients treated for a very common orthopaedic injury (distal radius fracture). It also explains the systematic way of recording these incidents and the usefulness of this system in patient management and staff training.

Patients and Methods

This is a prospective observational study conducted from March 2006 to May 2006. It is based upon observation of the critical incidents which were recorded in the proforma adapted from Orthopaedic Competence Assessment Project (OCAP) and Procedure Based Assessment (PBA). (Figure 1) by the surgeon or his first assistant. The critical incidents have been identified in the proforma. The guidelines for the proforma were mainly adapted from the Orthopaedic Competence Assessment Project (OCAP) and procedure based assessment (PBA'S) sheets from OCAP website [www.ocap.org.uk]. OCAP is the project of British Orthopaedic Association in collaboration with the Orthopaedic Speciality Advisory Committee, Royal College of Surgeons of Edinburgh and the Orthopaedic Department of University of Dundee.

The sample size was fifty and convenience sampling technique was used to select the patients.

All distal radius fractures, requiring Manipulation under anaesthesia (MUA), MUA and K-wire, open reduction and internal fixation and external fixation, were included in the study. Combined fractures of distal radius and ulna were excluded. Similarly fractures, which were manipulated or splinted in the Accident and Emergency Department (A&E) and were followed up in the fracture clinic, were not included.

Orthopaedic registrar on call in A & E department initially evaluated all the patients. The consultant in charge of the patient made the decision regarding the treatment. The procedure was explained to the patient and an informed consent was obtained. The actual procedure was performed either by the registrar or by the consultant himself. The proforma was made a part of the clinical notes and filled by the operating surgeon or the first assistant after completion of the procedure. Critical incidents where identified, were recorded in the proforma.

The data was collected from the proforma and analysed. The outcome of the critical incidents was measured in terms of unnecessary delay in surgery, prolonged surgical time, forced changed of surgical procedure, less favourable final results and any legal issue arising from these critical incidents.

Results

Between March 2006 to June 2006, 50 patients were admitted with fracture of the distal radius. Of these 36 (72%) were females and 14 (28%) were males. Male to female ratio was 1:2.2. The average age was 43.6 years (range 11-98 years).

The procedures done were; manipulation under anaesthesia in twelve (24%) patients, manipulation and K-wire fixation in twenty (40%) patients, application of external fixator in thirteen (26%) patients and open reduction and internal fixation with plate in 5 (10%) patients.

The procedures were carried out by the trainees in thirty five (70%) patients, by an associate specialist in four (8%) and by the consultants in eleven (22%) patients. Important instruments such as correct size screws and rods were missing from the tray on seven (14%) occasions, which caused un-necessary delay in the procedure. Suitable assistance and counter-traction was not available during three (6%) procedures. The scrub nurse was not familiar with the instruments and procedure in two (4%) cases. The drill was not working properly during two (4%) operations whereas in 1 (2%) patient, rushing through the procedure

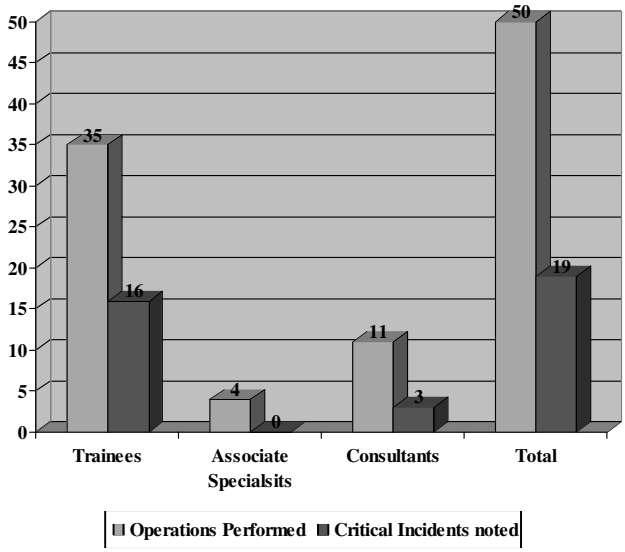

Figure: Critical Incidents in Distal Radius Fracture Management

occasion the Radiographer was not informed about the procedure on one (2%) occasion leading to delay in starting the procedure. One (2%) patient was not consented and marked before the operation and the consent was obtained in the recovery (Table 1).

Nineteen (38%) critical incidents were identified during these fifty procedures for the fractures of distal radius. Three occurred when a consultant orthopaedic surgeon was operating and sixteen occurred when trainees/ associate specialist were operating (Figure). Critical incidents occurred less frequently (27.22%) with consultants as compared to the trainees and associate specialist (41.02%).

The impact of these critical incidents was recorded (Table 2). It was observed that unnecessary delay occurred on three occasions, prolonged operative time on fourteen occasions and less favourable outcome on two occasions. There was no forced change of operative strategy in any patient due to these critical incidents.

Table 1: Critical Incidents associated with Distal Radius Fractures.

Critical Incident	Consultants n=11	Associate Specialist n=4	Trainees n=35	Total n=50
Instruments missing from the tray	2 (18.1%)	NIL	5 (14.2%)	7 (14%)
Suitable traction/counter-traction not available	Nil	NIL	3 (8.5%)	3 (6%)
Scrub nurse not familiar with the procedure	Nil	NIL	2 (5.7%)	2 (4%)
Drill not working properly	1 (9.0%)	NIL	1 (2.8%)	2 (4%)
Rushing through the procedure	Nil	NIL	1 (2.8%)	1 (2%)
Patient not clerked	Nil	NIL	1 (2.8%)	1 (2%)
Limb not elevated	Nil	NIL	1 (2.8%)	1 (2%)
Radiographer not informed	Nil	NIL	1 (2.8%)	1 (2%)
Patient not consented and marked	Nil	NIL	1 (2.8%)	1 (2%)
Total Incidents	3 (27.1%)	NIL	16 (45.7%)	19 (38%)

Table 2: Outcome of Critical Incidents.

Critical Incident	Total Incidents n=19	Outcome
Instruments missing from the tray	7 (89.4%)	Instruments like suitable rods for external fixation, suitable size pins and screws missing from the tray therefore prolonged operation time
Suitable traction/counter-traction not available	3 (15.7%)	Prolonged operation time
Scrub nurse not familiar with the procedure	2 (10.5%)	Prolonged operation time
Drill not working properly	2 (10.5%)	Replacement drill not sterilized therefore prolonged operation time
Rushing through the procedure	1 (5.2%)	Adequate reduction of the fracture not achieved therefore less favourable outcome
Patient not clerked	1 (5.2%)	Delay in Surgery
Limb not elevated	1 (5.2%)	Excessive swelling of the limb associated with prolonged hospital stay and less favourable outcome
Radiographer not informed	1 (5.2%)	Delay in Surgery
Patient not consented and marked	1 (5.2%)	Consented and marked in theatre therefore delay in Surgery

was identified as another emergency patient was on the way. On one (2%) occasion, the operation was delayed because the patient was not clerked in the period before being transfered to the theatres. In one (2%) case the arm was not elevated on a Bradford sling preoperatively and on another

Discussion

Critical incidents during patients care are not rare. About 3% to 17%[3,4] of the hospital inpatients have been associated with critical incidents that either did or could

have done patient harm.

The critical incident reporting system, which is in place in most of the hospitals in United Kingdom, has the tendency to miss significant safety incidents. Ali et al[5] demonstrated that the current system of incident reporting detected only 24% of all patient safety incidents and only 5% of incidents that resulted in patient harm. In 2006 Committee of Public Accounts recommended that relying on voluntary system of reporting may not be sufficient in gathering information on serious patient critical incidents.[6]

There is a high frequency of distal radius fractures and these injuries are managed mostly by trainees. This study was carried out on these aspects of the injuries. We identified that the most common critical incident associated with orthopaedic injuries was some instruments missing from the orthopaedic tray. These were correct size screws, drill bits and correct size plates for fixation. Replacing the used instruments was identified as a common factor associated with missing instruments from the trays. Critical Incident Identification form was considered to be an effective tool to check, replace and re-check the instruments tray before sterilization.

Incorporating the critical incident form with the clinical notes of 50 patients we identified 19 significant events occurring from patient's admission to discharge from the hospital.

Critical incident Identification form is very simple, easy to comprehend and very easy to complete. It takes minimum time to complete it and does not miss any event as compared to traditional incident reporting forms, which are difficult, and thus have a tendency to leave out important areas. This form can be used as a checklist for trainees to make sure that the patients with a distal radius fractures are managed appropriately. Algorithmic listing of actions to be performed in a given clinical setting ensures, that no step will be forgotten. This will allow them to thoroughly examine the patient, identify preoperative problems, take appropriate actions to manage these problems and make sure that the patient is ready to go ahead with the surgery. It will also ensure that proper postoperative instructions and care are advised for safe management of the patient. This same form can also be used by ward and theatre staff to make sure that the patient is ready for the theatre. This will facilitate safe and timely transfer of the patient to the operating room, reduce the operative time and avoid any delay in surgery.

Another advantage of this form is to identify any problem areas in the training of the junior orthopaedic doctors and the theatre staff, so that they can be addressed appropriately. This will also provide an evidence of satisfactory progression of the trainee's operative knowledge and skills. The trainees can also use these forms as an evidence of satisfactory training and log book.

Currently no sensitive and reliable system is available to identify critical incidents retrospectively. As these forms provide most accurate information on the management of the patients with distal radius fractures, they can be used as an effective tool for collecting retrospective data for audit and research purpose. The form can be used as a model for other commonly performed orthopaedic procedures to identify any critical incidences.

Conclusion

Routine critical incident reporting systems in hospitals do not give the broad spectrum of the problems especially those where actual harm to the patient has occurred. This technique of reporting of critical incidents, helps to identify the problem, take speedy action, to introduce the change and prevent its recurrence. This cost effective and user friendly technique is useful for identifying trends and issues to be discussed in departmental meetings for many elective and emergency orthopaedic procedures, but requires persistent motivation of the reporting staff.

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