THE QUALITY OF CARE AND THE CAUSATION OF DEATH

Death taking place in hospital within 30 days of a surgical operation is generally the consequence of a number of interrelated factors. This is very clearly seen by NCEPOD coordinators and advisors as they examine the questionnaires and other information for the many hundreds of deaths that make up each year's sample. Within these interrelated factors that contributed to the death of a patient will be some that are avoidable and some that are unavoidable. It is the responsibility of NCEPOD to identify the avoidable or remediable factors and then make recommendations as to how they might be eliminated. With quantifiable issues, for example organisational arrangements or the provision of facilities such as critical care beds, this is relatively straightforward but when it is an issue that is subject to judgement, for example the actions and behaviour of medical staff, then those judgements need to be carefully considered. NCEPOD only examines those patients who died and does not consider those who did well. In addition, we have the advantage of hindsight, and both these factors can cause bias unless we guard carefully against them. Yet much of the recent criticism of doctors has come from those outside of the profession who also have the advantage of hindsight and are invariably looking at aspects of care that did not go well for the patient. Often the judgements made appear simplistic to those who have a fuller understanding of all the factors that were involved.

Collected here are a number of cases from the current NCEPOD sample that in some way illustrate the interlinking of factors that contribute to death and the arbitrary way in which blame can sometimes fall on a single individual who may themselves be unaware of the consequences of their actions. If there is a conclusion to be drawn then it must be that only through examining the issues relating to individual cases can we begin to understand the relative importance of the many factors involved. For surgeons and anaesthetists this should be through multidisciplinary audit; specialists meeting together to improve care, recognising and wishing to overcome one's own shortcomings and limitations and not just blaming others. For patients, relatives and the public in general, it is the development of an understanding of modern healthcare, and particularly surgery and anaesthesia, based on the realities and not the fictional dramas of the mass media.

Case Study 1

An elderly man was admitted with a fractured neck of femur following a fall. He was a Jehovah's Witness and made clear that he would not accept a blood transfusion, signing forms to this effect. The consultant anaesthetist responsible for his care completed a detailed free text entry in the questionnaire returned to NCEPOD. This together with the postoperative notes from the intensive care unit gives a very clear description of the patient's medical management.

The anaesthetist and the theatre staff were concerned about the competence of the designated orthopaedic surgeon - a long term locum staff grade doctor - to undertake the operation on this patient. The theatre sister contacted two consultant orthopaedic surgeons to express these concerns prior to the operation, but they did not apparently feel the need to intervene.

The operation lasted nearly two hours and the measured blood loss was 1500 ml. The patient was moved to recovery and initially awoke and was orientated with stable vital signs. However, he then began to deteriorate with significant bleeding from the wound. He was transferred to the ICU where his haemoglobin which had been 12.5 gm/dl prior to the operation, was now measured as 4.9 gm/dl. The patient continued to develop progressive hypotension despite ventilation, fluids and adrenaline. He eventually died ten-and-a-half-hours after the end of the operation. At autopsy, the left anterior descending coronary artery was 70% stenosed

by atheroma and the right coronary artery showed 50% stenosis by atheroma. The pathologist gave the disease or condition leading to death as congestive cardiac failure due to or as a consequence of coronary artery atheroma. Anaemia secondary to osteoporotic fractured neck of femur (operated) was listed as a significant condition contributing to the death but not related to the condition causing it.

The orthopaedic surgeons did not return the questionnaire sent to them by NCEPOD.

Can we take the pathologist as the final arbiter and accept that the coronary artery atheroma was the primary cause of this patient's death? Alternatively, should we read between the lines of the anaesthetist's comments and accept that this death was avoidable if a more competent surgeon had carried out the operation? Or is the death the consequence of the patient's own choice in being a Jehovah's Witness, refusing blood transfusion and then suffering a significant traumatic injury?

Case Study 2

An 86-year-old woman was admitted in the late evening from the A&E Department under the care of a locum consultant surgeon. The admission note records that she had had a lump in the left groin for a year and during the previous three weeks she had been unwell with vomiting. However, her general health was good and she lived independently. On examination she was severely dehydrated, she had abdominal pain with vomiting and a long-standing uterine prolapse. Although the presumptive diagnosis was an incarcerated left femoral hernia, no decision was made to operate but further investigations were requested. It was stated that the patient needed an HDU bed. However, for some reason she stayed for resuscitation on the general ward.

At 01.00 the ICU SpR visited the patient and examined her. The note made at the time recommends hourly CVP and urine output measurement but it was felt that she did not warrant ICU admission at that time. At the ward round the following morning it was recorded that the patient had had no urine output since admission but no medical staff had been made aware by the ward staff of her overnight anuria. At 10.00 the patient was transferred to the ICU but despite aggressive resuscitation with fluids she continued to deteriorate and required intubation and ventilation. A review at 12.30 notes that she was now on adrenaline and dopamine, peripherally shut down with a distended abdomen and a base deficit of -16.5 mmol/l. Following discussion, it was agreed that although the prognosis was very poor, it was necessary to proceed to an emergency laparotomy. At the operation, which was carried out by another consultant, the peritoneal cavity was found to be full of faecal fluid and that a large part of the bowel was ischaemic. The wound was closed. She was returned to the ICU and made comfortable. She died at 17.48.

Would the findings at operation have been different if she had gone to theatre soon after admission rather than 14 hours later? Would the resuscitation have been more effective if she had gone to ICU overnight rather than being on a ward where her continued anuria was ignored? Or was the patient's apparent stoicism, which resulted in her not reaching hospital until her malaise and vomiting had lasted for three weeks, the ultimate cause of her own demise? Her son and daughter lived close to her and their involvement with the decisions relating to her hospital care are carefully recorded; could they have done more prior to her admission? Certainly once she developed extensive bowel ischaemia her death was inevitable, but at what time was this point of no return reached?

Case Study 3

A 57-year-old arteriopath died three days after a below knee amputation. The cause of death given at the post-mortem was 1a) acute left ventricular failure 1b) myocardial ischaemia 1c) coronary artery atheroma. Fifteen years earlier, at the age of 42, he had undergone an aorto-femoral by-pass and later a false aneurysm developed at the distal end of the graft. A second operation to repair this had been followed by ischaemia which had necessitated the amputation.

The patient admitted to smoking 70 cigarettes a week, but the anaesthetist recorded the consumption as up to 50 per day. The report of the carefully conducted postmortem makes no reference to this history of cigarette consumption nor is smoking listed anywhere as the cause of death.

This is a gross example of the contribution that patients can make to their own death. In many other cases there are less obvious, but none the less

important contributory factors, that relate to the patient's lifestyle and general health, excess weight being the most obvious. In assessing the causation of death there is a curious reluctance to state openly the patient's own contribution. Perhaps this is because we can all, including doctors and other health professionals, be patients. It is however still remarkable that in a case such as this, the officially recorded cause of death makes no reference to this self-inflicted factor.

Case Study 4

Four days before Christmas, a man aged 63 went to theatre for a right hemicolectomy. He suffered from hypertension and was receiving treatment with atenolol and nifedipine but he was of normal weight and was graded as ASA 2. The anaesthetist inserted a radial arterial line, a triple lumen CVP through the right internal jugular and sited an epidural at L2/3. The surgery lasted 90 minutes and the patient was stable throughout, under a general anaesthetic together with the epidural. The operative blood loss was recorded as 850 ml and a litre of crystalloid followed by 2.5 litres of colloid was given in theatre. The anaesthetist noted that 'ideally the patient would have been managed in an HDU postoperatively so that the epidural could have been continued for analgesia'. As there was no HDU, the epidural catheter and arterial line were removed in the recovery suite and a PCA pump was set up for pain relief. The anaesthetist had left instructions that the patient was to be transfused if the haemoglobin fell below 7.0 gm/dl. A check on the blood gas machine in recovery showed it to be 8.4 gm/dl. After three-and-half-hours in recovery the patient was returned to the ward.

The postoperative information available is limited, because the surgical questionnaire was not returned. However the anaesthetist states that there was an initial fall in urine output on day one and it was unclear whether this was due to a blocked catheter or hypovolaemia. In any event, it is clear that the patient received 5500 ml of crystalloid and a further 2000 ml of colloid in what would appear to be four fluid challenges of 500 ml, during the first 24 hours following the operation. There was bleeding through the abdominal drain of 800 ml and the haemoglobin on the first post-operative day fell to 5.0 gm/dl. At this stage the patient received a 6-unit blood transfusion. On Christmas Day, day four, the patient who was continuing to receive pain relief from the PCA and was requiring about 50 mg of morphine a day, suffered respiratory distress. There was consolidation in the right middle and lower lobe. This improved with physiotherapy and ICU transfer was considered but no bed was available. Following this, the patient's confusion increased and his oxygen saturation decreased. His arrest, at midday on Boxing Day, was noted as being unwitnessed by medical or nursing staff.

The anaesthetic questionnaire records that this anaesthetic department does not have morbidity/mortality review meetings and that this case will not therefore be discussed.

The obvious response to this patient's demise is to say that all acute hospitals require HDU beds and this patient's management clearly suffered as a result of the lack of this essential resource. However, the failure to return a surgical questionnaire and the absence of essential medical audit in this hospital might suggest that the clinicians involved would benefit their patients if they examined the totality of the care they offered and developed a more coordinated cross disciplinary team ethos. Finally, although the information available on which to base conclusions is limited, there must be questions as to the quality of patient care on this ward during a long Bank Holiday period.

Case Study 5

An 81-year-old woman suffered a complicated intertrochanteric fracture of the femur. She had surgery the following day on a daytime trauma list. The surgeon was a locum registrar and there was no consultant in theatre. A consultant anaesthetist started the case. He advised the locum orthopaedic registrar to get senior help as the surgery was obviously going to be complicated and challenging. The registrar ignored this advice. The anaesthetist was called away and left the case with a staff grade doctor. There was considerable bleeding and eventually, when the operation was clearly not going well, the consultant orthopaedic surgeon was summoned. The operation took three-and-a-half-hours. The consultant anaesthetist specifically asked the locum registrar to review the patient postoperatively and consider blood transfusion if indicated. The anaesthetist reported that there was no documentation in the notes that this was ever done. The following day the patient developed a stroke. This was followed by a chest and wound infection. She died one week after surgery.

The locum orthopaedic registrar appears to lack insight. Faced with a difficult fracture and advice from a senior anaesthetic colleague to seek help, he ploughed on. The abortive attempts to reduce the fracture and subsequent difficulties resulted in excessive blood loss and an operation that took three times longer than expected (according to advice from our Advisors). To compound this patient's problems, the surgeon failed to review the patient in the immediate postoperative period and take appropriate steps to correct blood loss. However, not all the blame can be levelled at this registrar. We must ask what steps the consultant orthopaedic surgeon had taken to assess the locum's ability particularly when faced with a difficult fracture. Why was the consultant surgeon not present, at least at the start of the procedure? The consultant anaesthetist is critical of the locum registrar surgeon but was it reasonable given the concerns he or she expresses, to leave the anaesthetised patient with a staff-grade anaesthetist, and did not the anaesthetist also have a responsibility to visit the patient postoperatively to ensure all was well? Or are these various deficiencies in care irrelevant when the cause of the patient's death was the unfortunate postoperative stroke?

Case Study 6

An 80-year-old patient was admitted with a displaced intracapsular fracture of the femoral neck. She was known to have ischaemic heart disease, confusion and transient ischaemic attacks. Both the house surgeon and registrar were new and were not available to talk to the consultant anaesthetist when he visited the patient on the day prior to surgery. The anaesthetist noted that the patient had not had adequate fluid therapy and that the latest blood results were not available. The new orthopaedic registrar did a hemi-arthroplasty using cement. There was no surgical consultant in theatre. The patient suffered a cardiac arrest at 'cementation'. She was resuscitated but died in ICU 15 days later.

The consultant anaesthetist pointed out that the changeover of trainees at certain times of the year causes problems. These include inexperience, lack of knowledge of the patients and impaired continuity of care, poor communication and lack of awareness of local guidelines and surgical practice. In this case there were doubts about preoperative electrolyte imbalance, the preoperative biochemistry was not available and the surgical staff were not accessible in order to discuss the patient. Should we take these comments at face value or are they indicative of the anaesthetist shifting responsibility away from his/her failure to resuscitate the patient adequately prior to the operation?

Case Study 7

An 88-year-old man with senile dementia suffered an intertrochanteric femoral fracture. Five days were spent improving his general condition, as he had an established chest infection when admitted. With antibiotics and chest physiotherapy he improved and was deemed fit for anaesthesia albeit in a high-risk category. Surgery was done by an experienced registrar with a consultant assisting. He slowly declined and died in a community hospital six days later.

Fluid charts submitted with the questionnaires covered six days, from two days prior to surgery until the third postoperative day. Preoperatively these charts show no numerical entries in the 'Output' side other than comments such as 'wet bed', 'incontinent ++' and 'damp pads'. The totals for output are recorded as question marks. This situation clearly continued for two-and-a-half-days until the afternoon of surgery, during which the patient was catheterised. The catheter was removed on the third postoperative day and immediately the charts revert to recording output as '?' and 'wet bed'.

This patient was a high risk but a decision was made to embark on a programme of chest physiotherapy in the hope that successful surgery and subsequent mobilisation would relieve pain and help prevent further deterioration of respiratory function. Despite these positive decisions, he was allowed to lie in a wet bed for two-and-a-half-days, fluid charts were poorly completed and there can have been no satisfactory assessment of his state of hydration. There cannot be a sensible argument against catheterising such a patient and, even if the surgeons were reluctant to do so for fear of infection, there would have been some compelling nursing indications such as accurate fluid balance measurement and the prevention of pressure sores. The impression is one of neglect, poor nursing standards and the negation of the professed intention to achieve a successful outcome. The advisors identified many similar cases both in orthopaedic surgery and other specialties.

Case Study 8

A mildly-obese woman (weight 86 kg: height 5' 6": BMI 31) aged 39 was admitted for an elective laparosopy to investigate abdominal pain that was thought to result from an ovarian cyst. She was otherwise well and was graded as ASA 1. The laparoscopy was carried out by an SpR 1/2 in gynaecology who had been seven months in the grade and who had carried out 45 similar procedures in the previous 12 months. The consultant was 'supervising but not scrubbed'. The ovaries were found to be normal but there was old blood stained fluid within the adnexae and it was concluded that the pain was caused by a recurrence of the patient's endometriosis. Some adhesions were divided bluntly. The procedure lasted 20 minutes.

The patient recovered well and was seen four hours after the operation by the surgeon when she was eating, drinking and all appeared well. It was planned that she would go home the next morning but in the event she was unwell and could not do so. The consultant gynaecologist was engaged at peripheral clinics all day and did not see the patient. The note made by the SHO at the 09.00 ward round records that the patient complained of 'feeling terrible', had generalised abdominal pain and hot/cold sweats. On examination she was flushed with a temperature of 37.4°C, the pulse rate was 100 and the blood pressure 130/70 mmHg. Abdominal examination showed mild distension and it was noted that the patient 'doesn't allow the slightest touch'. The SHO's impression was that this might be the result of bleeding or the retention of laparoscopic gas. At 14.10 the patient was noted to have continuing lower abdominal pain and she had had diarrhoea and had been vomiting. She was examined and bowel sounds were heard. The lower abdomen was tender but there was no rebound or guarding. The impression recorded was that a bowel perforation was unlikely.

At 05.30 the following morning the patient pressed her buzzer as she wished to pass urine. The nursing note records that she was feeling dizzy and was breathing rapidly. As she sat on the edge of the bed she became 'quite clammy'. She was laid back in bed and her blood pressure was now 90/60 mmHg but was 'very faint'. The nurse could not measure her saturation as 'the machine would not work'. The gynaecology SHO was called but was unable to site an IV so the anaesthetic SHO who came to assist inserted a 17G Venflon and started fluid resuscitation. Oxygen was given. The medical on-call SpR, the gynaecology SpR and the anaesthetic SpR from ICU were all called. The nursing note records that the ECG machine would not work and another had to be found. At 06.05 the anaesthetist states that the patient was 'severely unwell'. She was cold, clammy and peripherally shut down and was semi-conscious. Respiration was laboured and poor, an arterial blood gas showed the PCO_2 to be 10 kPa. It was decided to intubate the patient but it is recorded that no emergency drugs for intubation were immediately available nor was there any suction tubing. The patient was pre-oxygenated and given 10 mg etomidate and 100 mg suxamethonium. The initial intubation with cricoid pressure was into the oesophagus but this was immediately noted. However the patient was now pulseless with electro-mechanical dissociation on the ECG. After two further attempts intubation was successful and the patient was transferred to the ICU, but following various further interventions, she died just over an hour later.

At postmortem, well-established faecal peritonitis was noted and about 800 ml of thick faeculant fluid was drained. No bowel perforation could be identified despite a careful search. The pathologist in his report noted that

> *"Inadvertent traumatic perforation of the bowel is a well-recognised potential complication of laparoscopy, with reported incidence of 1.6 to 1.8 per 1000 procedures. Only about 60% of bowel injuries are detected at the time of the laparoscopy. Injuries to the bowel can be treacherous because they may not be recognised at the time of the procedure. Perforation, however small, leads to spillage of intestinal contents into the peritoneal cavity and hence peritonitis. Mortality is high once peritonitis has set in".*

The consultant gynaecologist is critical of the nursing notes. The Anaesthetic Advisors at NCEPOD were critical of the consultant gynaecologist for not attending the postmortem because of 'other commitments' and because he 'did not know the time' of the procedure. They were also critical of the resuscitation arrangements on the ward. The Surgical Advisors were critical of the 'junior staff' for being 'unaware of the dangers of perforation and signs of perforation'.

When considering this unfortunate patient it is difficult not to be influenced by her young age. A death at the age of 39 years in such circumstances is tragic, particularly when the patient was fit and the procedure was essentially investigative. The case is described in detail because individually, the actions of the staff involved would appear to have been satisfactory. Yet, as the criticisms made with the advantage of hindsight by the Anaesthetic and Surgical Advisors demonstrate, at some point this must have been avoidable. But was it?

CONCLUSION

From time to time, NCEPOD has been condemned for presenting vignettes that merely criticise clinicians and afford no educational value. The cases highlighted here might be seen as an example of this tendency, particularly by those doctors who think they can identify themselves from the amount of information given. No clinician at NCEPOD would be able to make such an identification due to the anonymisation of the patient records. It is hoped that those reading this section will, whilst recognising the highly selected nature of the cases, see that they represent the difficulties that are experienced in everyday practice. Too often, individuals or groups misunderstand the efforts of others and so criticise their actions, whilst at the same time they do not address their own failings. This applies to patients as well as the medical staff and those administering the provision of resources.