IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: 2008 5233

FINDING INTO DEATH WITH INQUEST

Form 37 Rule 60(1)
Section 67 of the ***Coroners Act 2008***

Inquest into the Death of: JEANETTE BROWN

Delivered On:	14 DECEMBER 2012
Delivered At:	MELBOURNE
Hearing Dates:	19 NOVEMBER 2012
Findings of:	CORONER K.M.W. PARKINSON
Place of death/Suspected death:	MONASH MEDICAL CENTRE.
Counsel Assisting	Sergeant Dave Dimsey
Appearances:	Mr Snowdon on behalf of Southern Health

I, KIM M. W. PARKINSON, Coroner having investigated the death of JEANETTE BROWN

AND having held an inquest in relation to this death on 19 November 2012
at MELBOURNE
find that the identity of the deceased was JEANETTE BROWN
born on 1 March 1942
and the death occurred on 22 November 2008
at Monash Medical Centre, 2/246 Clayton Road, Clayton, 3168

from:

1a. MULTIORGAN FAILURE ASSOCIATED WITH HAEMORRHAGE AND SEPSIS FOLLOWING CHOLECYSTECTOMY

in the following circumstances:

1. An inquest was conducted into the death of Mrs Jeanette Brown on 19 November 2012. The following witnesses gave evidence in the proceedings: Gastrointestinal Surgeons Mr Roger Berry and Mr Daniel Croagh. Associate Professor Richard Cade, who had been retained by the court to provide an expert opinion.

2. Mrs Brown was 66 years of age at the time of her death. She had a medical history of left nephrectomy, cholelisthiasis, hypertension and type two diabetes mellitus. She was admitted to the Monash Medical Centre on 13 November 2008 for elective laparoscopic cholecystectomy, intra-operative cholangiogram and possible biliary reconstruction. The surgery was described as relatively straightforward and routine, however as there were some indicators of possible malignancy, surgeons had considered and discussed with Mrs Brown the possibility of more extensive surgical intervention if necessary. Permission had been obtained.

3. Mrs Brown underwent laparoscopic cholecystectomy at Monash Medical Centre on 14 November 2008. The surgery was performed by Dr Daniel Croagh, a surgical fellow under the supervision of Mr Roger Berry. During the course of the surgery, a multi use applicator was utilised to apply arterial clips.

4. Dr Croagh described that there was some difficulty with the application and the use of the applicator and it became apparent that the surgical clips had not been properly fixed. The applicator was re-loaded and additional clips were applied.

5. The evidence is that the applicator being utilised was a multi-use applicator with which surgeons sometimes experienced difficulty in securely fixing the clips on discharge. This may have been as a result of the characteristics of the applicator, the manner of pre-loading or in the application itself. The evidence of each of the clinicians is that they prefer to use and now use single use applicators.

6. Dr Croagh identified the initial failure to securely fix the clips and repeated the process. It appeared at the conclusion of the surgery that the clips were adhering as required. The surgery was completed and Mrs Brown was transferred to the recovery room.

7. Whilst in recovery a 200mL bleed was detected from a port site and the surgical registrar attended and re-sutured the site. The bleeding was not sufficient to cause the registrar concern.

8. At 12.20pm on the ward, Mrs Brown was noted to be hypertensive at 199/90mmHg and anti-hypertensive medication amlodipine was administered which initially brought the blood pressure down to 140/80. At 3.05pm, Mrs Brown's blood pressure was recorded at 65/44mmHg. This hypotensive episode was attributed to the anti-hypertensive medication administered earlier in the morning. She was administered 250mL bolus of haemaccel, which had short-term effect to increase her blood pressure, however shortly afterwards Mrs Brown again became hypotensive.

9. At 4.50pm, she was again hypotensive at 100/70 and assessed by the surgical resident, Dr Arulanandarajah who felt she was suffering with hypovolaemia. Dr Arulanandarajah reported that her abdomen was soft and with no tenderness. Another bolus of fluid was administered with short-term effect. She was again hypotensive at 6.25pm when her blood pressure dropped to 100/50.

10. Neither the consultant nor Dr Croagh was notified at that time of the profound or continuing hypotension. Monitoring continued and Mrs Brown's blood pressure was unstable from that time. A further review at an un-noted time recorded BP at 100/50mmHg, soft abdomen and mild discomfort. By 7.40pm notes record that she was sweaty and clammy + + +, her blood pressure was 106/71 and that her abdomen was tender with some guarding. Dr Arulanandarajah contacted the on-call surgical registrar, Dr Koh. There is some uncertainty as to whether this contact occurred at 7pm or 7.40pm, however when contact was made, Dr Koh instructed her to call for the pathology results and she would attend the ward shortly. Her haemoglobin was reported as having fallen from the pre-operative level of 143g/L to 93g/L. Mrs Brown was then examined by the Dr Koh who then contacted Dr Croagh.

11. Dr Croagh stated that the surgical registrar contacted him at 8.20pm to advise of the low haemoglobin result and he directed that the patient be transferred immediately to surgery. When he arrived at the hospital at 9pm Mrs Brown was still on the ward and with the assistance of the registrar, he pushed the bed around to the theatre at 9.10pm.

12. A further delay was experienced at surgery due to there being no operating theatre immediately available, however the anaesthetists attended upon Mrs Brown and commenced resuscitation measures. The delay to surgery was in the order of half an hour and it is unclear whether this delay contributed to Mrs Brown deterioration, although it cannot be entirely excluded.

13. Dr Croagh reported that the second operation began at 9.45pm. The old port site was reused to enter the abdomen and there was a large amount of blood (approximately 1.5litres) in the abdominal cavity, which was evacuated. The cystic artery was bleeding secondary to the clips having displaced and Dr Croagh stated that this was clearly the source of the bleeding.

14. The cystic artery was then re-clipped and the bleeding controlled. A drain tube was left to monitor for further post-operative bleeding. Dr Croagh stated that whilst Mrs Brown did not lose consciousness prior to the surgery she was very acidotic following the haemorrhage, suggesting that she had been profoundly shocked and her liver and kidneys were severely affected by the low blood pressure.

15. She was transferred to the Intensive Care Unit where her condition appeared to improve sufficiently for discharge to the ward late on 15 November 2008. However her condition again deteriorated and she became increasingly drowsy, unresponsive and hypertensive. Her respiration rate was greatly elevated at 40 breaths per minute. She was reviewed by the intensive care and renal physicians. Mrs Brown was readmitted to the ICU on 20 November where she was intubated. Whilst a CT brain scan did not reveal any infarcts (strokes), an MRI suggested abnormality of the brain stem and deep white matter and she developed multi-organ failure. Neurological, Surgical and ICU Review occurred and doctors advised her family that her prognosis for recovery was poor. After consulting with family, Mrs Brown was palliated and she died on 22 November 2008.

16. Professor David Ranson, Forensic Pathologist and Deputy Director of the Victorian Institute of Forensic Medicine reported the cause of death as: 1(a) Multi-organ failure associated with haemorrhage and sepsis following cholecystectomy.

17. The operative and post-operative management and in particular the length of time taken to identify the post surgical bleed and consequent surgical intervention were considered during the inquest.

18. Dr Croagh stated that he believed that there were difficulties in using the multi use clip applicator, which may have contributed to inadequacy of the second clipping of the artery at the first operation. He stated:

> *"It was sometimes difficult to ensure smooth passage of the clip applier through the laparascopic port with the result that there was sometimes minor dislodgement of the clip in this process and subsequent misapplication around the cystic duct or artery. Certainly in this case the application of the clips was initially inadequate and these were replaced".*

and that:

> *"The application of the clips may have been inadequate or the clips may have been disturbed or knocked during the conduct of the remainder of the operation".*

19. Dr Croagh commented that there was no bleeding upon division of the vessel suggesting that at the time, the artery had been adequately clamped and the reapplied clips appeared to be secure. He concluded that the dislodgement of the clips post operatively was perhaps partly precipitated by the very high postoperative blood pressure and a failure of the reapplied clips to fully secure the artery.

20. None of the surgeons were concerned that the laparoscopic procedure of itself was a contributing factor to the difficulties associated with clipping the artery.

21. Dr Croagh stated that the hypotension was a significant indicator of possible post surgical bleeding and that warranted further investigation. He commented:

> *"A blood pressure of 65/44 in the post operative period is always a concern. The patient did respond to filling, but then became hypotensive again which one might expect if Mrs Brown had ongoing haemorrhage. The overall impression from the BP recordings taken between 1505 and 1830 is that of significant hypovolaemia. Unfortunately, otherwise healthy patients can often appear quite "well" as they attempt to compensate for hypovolaemia. More senior surgical review may have recognised these subtle signs and prompted more aggressive intervention".*

22. His evidence was that a more senior clinician such as the consultant or the surgical registrar ought to have been notified of the patient's status at 3.05pm and that intervention would then have occurred, probably in the form of returning the patient to surgery. Dr Croagh stated that had there been earlier intervention either by surgery or aggressive resuscitation measures at or around 3.05pm or as the hypotensive episodes continued, the outcome may well have been different.

23. Mr Berry also agreed that this would have been the appropriate management.

24. Associate Professor Cade provided an expert opinion to the court of the post surgical clinical management and stated that a 200ml bleed from the port site, whilst having regard to the subsequent events might suggest manifestation of internal bleeding, was reasonably assessed

as from the site itself and not from the peritoneal cavity. In those circumstances, he regarded the initial postoperative management in recovery as reasonable.

25. Associate Professor Cade, however, commented that the hypotensive events at 3.05pm and following warranted earlier and more senior intervention and review. He commented that had a more experienced surgical clinician or the consultant been notified of the hypotensive event at 3.05pm or the subsequent recurring hypotensive events, a diagnosis of post-operative bleed would likely have been made earlier and surgical intervention would have occurred. The concern was a failure to recognise the deterioration and a failure to escalate the deterioration to a more senior clinician.

26. Professor Cade also commented that most hospitals have now implemented escalation protocols for care in a deteriorating patient that results in progressively senior clinicians being called rather than a junior doctor continuing to deal with a deteriorating patient.

27. The hospital made the following concessions in relation to the events:

    (i) That Southern Health does not assert that the clips supplied were defective or unfit for purpose.

    (ii) Southern Health concedes that the clips referred to above and applied during Mrs Brown's surgery to the cystic artery, or at least one of them, was not applied strictly as intended by the operator and was slightly misplaced in terms of its final, fixed position.

    (iii) The misplacement described above was the precursor incident to the event which resulted in Mrs Brown suffering post-operative bleeding.

28. Southern Health submitted additional statements from Dr Croagh and Mr Berry in relation to the issues of clinical management, which Southern Health adopted, and the health service did not challenge the opinions as to clinical management expressed by Associate Professor Cade in his report of 3 February 2012.

29. Dr Arulanandarajah the surgical resident attending Mrs Brown upon the ward, was unavailable to give evidence in the proceedings however advised the court that she accepted

the conclusions of the expert Professor Cade and the observations of Dr Croagh and the concessions made by Southern Health.

30. I find that Mrs Brown suffered a significant post surgical bleed in circumstances where the arterial clips applied during the surgery on 13 November 2008 to the cystic artery were displaced possibly as a result of initial misapplication and assisted by the significant hypertension post surgery.

31. I am satisfied that had there been earlier and more senior medical response to the profound hypotension at 3.05pm it is likely that the post surgical bleed would have been identified earlier and this would have resulted in earlier surgical intervention and that death may have been prevented.

32. I find that failure to notify the surgeon of the concerning and persistent hypotension was a contributing factor in the death.

33. I find that reliance on the fact that anti-hypertensive medication had been administered as the explanation for the profound hypotension was a significant error in management of the patient and that error was borne out of lack of experience.

34. I find that failure in the junior medical staff to recognise that the persistent hypotension was a concerning clinical indicator which warranted more senior intervention was a contributing factor in the death.

35. I find that Ms Jeanette Brown died on 22 November 2008 as a result of Multi-organ failure associated with haemorrhage and sepsis following cholecystectomy.

I make the following comment(s) connected with the death including matters relating to public health and safety and (including any notification to the Director of Public Prosecutions under 67(3) of the Coroners Act 2008

36. The evidence is that Southern Health has introduced additional protocols for escalation of care of deteriorating patients to more senior clinicians. These protocols ought to reduce the likelihood of failure to respond to significant clinical indicators.

37. Whilst it is not suggested by the hospital or the witnesses that the applicators were faulty, the evidence is that the hospital no longer uses the multi use clip applicators in use at the time of the surgery and now use single application disposable applicators. The surgeons have given evidence that they find these applicators easier to use as they passes through the port in an unloaded state and are loaded within the abdominal cavity, making them less prone to opportunity for the clip to be knocked out of correct alignment as it pass through the abdominal port.

I make the following recommendation(s) connected with the death under s72 (2) of the Coroners Act 2008:

1. In view of the procedural changes discussed above, I make no recommendations in this matter.

2. I direct that a copy of these findings be provided to the Family, the Interested Parties, Associate Professor Cade, Mr Roger Berry and Mr Daniel Croagh.

Signature:

KIM M. W. PARKINSON
CORONER
Date: 14 December 2012