QUEENSLAND COURTS

CORONERS COURT OF QUEENSLAND

FINDINGS OF INVESTIGATION

CITATION:	**Non-inquest findings into the death of PG**
TITLE OF COURT:	Coroners Court
JURISDICTION:	Southport
DATE:	24 May 2017
FILE NO(s):	2013/1612
FINDINGS OF:	James McDougall, Coroner
CATCHWORDS:	CORONERS: back pain, surgery, post-operative period treatment

Contents

Background

PG was 75 years old. He lived in Southport. He had a complex range of medical conditions which included supra-nuclear palsy, cognitive impairment and Parkinson's disease with significant movement and speech difficulties. He also had a history of hypertension, hypercholesterolaemia and glaucoma.

On 16 April 2013, Mr PG was admitted to a private hospital from a Rehabilitation Unit from another private hospital for the treatment of chronic low back pain which had been unresponsive to steroid injections and analgesia. The cause of his back pain and right sciatica was found to be advanced degenerative disease of the lumbar spine at L3/4 and L4/5 with spinal canal stenosis associated with a right lateral disc protrusion compressing the nerve root. Mr PG was reviewed by neurosurgeon, Dr LT who suggested that he undergo operative management. Between 23 and 25 April 2013 Mr PG underwent a two-stage back surgery initially involving L3/4 and L4/5 extreme lateral interbody fusion, and a decompression lumbar laminectomy and L3/4 discectomy. He was immediately commenced on anticoagulation medication. Post-operatively, Mr PG reportedly had no pain when lying still in bed, but experienced considerable pain when he repositioned. He subsequently started to complain of abdominal pain and distension, and was found to have deteriorating renal function.

On 1 May 2013, a CT scan of the abdomen was conducted which showed extensive retroperitoneal haematoma on the left-hand side extending from the level of the mid-kidney to the left common femoral vessels. The left kidney was not obstructed. At this time his anticoagulation therapy was ceased. On 2 May 2013, Mr PG was reviewed by nephrologist, Dr AP who was of the view that he was suffering from acute renal failure secondary to blood loss and hypotension. He was subsequently transferred to the intensive care unit for haemodynamic monitoring. There were differing diagnoses as to the cause of the retroperitoneal haemorrhage, but it was thought to be most likely venous blood. An echocardiogram was performed which showed a small left ventricular cavity with abnormal septal wall motion. Mr PG's renal function improved with fluid therapy and although he continued to have pain, it was able to be adequately controlled through pain relief. On 7 May 2013, Mr PG was scheduled to be discharged from the ICU. Unfortunately, he suddenly became unconscious and went into cardiac arrest. Despite extensive resuscitation efforts, Mr PG was declared deceased at 8.22am. It was suspected that he had suffered a massive pulmonary embolus.

Autopsy findings

An autopsy was conducted on 9 May 2013. Following internal examination, a large haemorrhage was observed which originated from the area of the lumbar spine at the site of recent surgery that continued into the back of the abdomen. No discrete blood vessels could be identified as to the source of the haemorrhage, with the major arteries and veins in the lower abdomen and their branches appearing to be intact. A blood clot weighing almost 2.4kg, which is almost 50% of Mr GP's blood volume, was removed from the haemorrhage. Coronary atherosclerosis was also found, however no significant luminal narrowing was noted. The pathologist concluded that the cause of Mr PG's death was left retroperitoneal haemorrhage associated with his lumbar spine surgery.

Clinical statements

During the course of the coronial investigation a number of statements were sought from the doctors involved in Mr PG's care and treatment at the private hospital.

Statement of Neurosurgeon, Dr LT, dated 3 June 2014

According to Dr LT, he first saw Mr PG on 15 April 2013 in relation to complaints of increasing back pain said to have been present since November 2012. Previous attempts to treat his ailments conservatively had been unsuccessful. A subsequent x-ray and MRI conducted

showed a grade 1 L3/4 and L4/5 degenerative listhesis with severe L3/4 and L4/5 canal stenosis. It also showed right L3/4 disc protrusion and right L3/4 and L4/5 foraminal stenosis. Dr LT noted that Mr PG had been bed bound for quite some time and had been hospitalised. As such, his risk of developing a post-operative deep vein thrombosis (DVT) was considered to be significant and he was commenced on perioperative anticoagulant therapy.

Subsequently Dr LT recommended operative treatment by way of L3/4 and L4/5 extreme lateral interbody fusion (XLIF), and a decompression lumbar laminectomy and L3/4 discectomy. Dr LT said he explained the nature of the surgery to Mr PG and his family, as well as the operative risks, including the 1% chance of a patient suffering a serious or minor complication as a result. Patient information sheets about the two-stage operation procedures were also provided to the family. He maintains that Mr PG's family were well-informed as to the nature of the operations to be performed and the associated risks. Dr TL says that Mr GP's family provided consent for the surgery to be conducted and, as such, on 17 April 2013 he was transferred from the initial private hospital to the second private hospital. Dr LT describes Mr PG's surgery as 'uneventful'. Unfortunately, four days after surgery he started to develop a distended bowel. It was discovered that he had a retroperitoneal haemorrhage and, as such, anticoagulant therapy had to be ceased. He received a blood transfusion, however as he was unable to mobilise due to the pain he was at high risk of developing a pulmonary embolism (PE). Although his condition was said to be stabilised, Mr PG died suddenly after suffering a cardiac event on 7 May 2013.

Statement of Intensivist and Emergency Physician, Dr JR, dated 28 June 2014

Dr JR first became involved in Mr PG's care and treatment at the private hospital on 2 May 2013 when he was contacted by Dr AP and advised of a patient transfer to the ICU. Dr JR subsequently performed a 'rapid primary survey' of Mr PG, from which he determined that whilst he appeared to be relatively stable, he required intravenous fluids and blood transfusions. This treatment was organised and a bed was sought in the ICU. A further comprehensive history and examination was conducted following Mr PG's admission to ICU at 10:15am on 2 May 2013. Dr JR suspected that he was suffering from a retroperitoneal bleed following his back surgery, as was supported by a prior abdominal CT scan. Dr JR describes Mr PG as 'awake, cooperative and answering questions slowly but accurately'. His pain was primarily abdominal, for which he was being provided analgesia. He had no respiratory distress and was well saturated on nasal oxygen. He was suffering from acute renal failure with normal potassium. Dr JR noted that the previous imaging conducted was suggestive of an extensive left-sided retroperitoneal haemorrhage, which extended from the left kidney to the level of the left common femoral vessels. The kidneys were well perfused and there was no evidence of ureteric obstructions. Dr JR concluded that the most likely cause of Mr PG's condition was a venous bleed associated with thrombo-prophylactic anticoagulation. He noted that there was potentially a number of contributing factors to the acute renal failure, including raised intra-abdominal pressure, hypovolaemia and drug toxicity.

Dr JR subsequently organised an echocardiogram and measurement of intra-abdominal pressure, which was normal. He concluded that blood transfusion, fluid resuscitation, and cessation of anticoagulants and a watchful waiting conservative management strategy was appropriate. This plan was discussed and collectively agreed to by Dr AP, Urologist, Dr JP, Physician, Dr SN and Dr LT. Dr JR subsequently prescribed Mr PG ongoing intravenous fluid and a transfusion of packed cells. Anti-thrombotic stockings and devices were continued. He remained stable during the treatment provided by Dr JR on 2 May 2013. Dr JR had no further involvement in Mr PG's care and treatment after this date.

Expert reports

Neurosurgeon, Dr Leigh Atkinson

On 26 September 2014, Neurosurgeon Dr Leigh Atkinson provided an expert report in relation to the appropriateness of the care and treatment provided to Mr PG, particularly whether the operative treatment was contraindicated. In relation to Mr PG's medical history, Dr Atkinson noted that he had a complex range of comorbidities. The cause of his back pain and right sciatica was advanced degenerative disease of the lumbar spine at L3/4 and L4/5 with spinal canal stenosis associated with right lateral disc protrusion compressing the nerve root. Relevantly, in relation to the operative treatment of Mr PG's back pain by Dr LT, Dr Atkinson noted the following:

- Having reviewed the records and MRI of the lumbar spine on 20 March 2013, he is of the view that the cause of Mr PG's back pain was his degenerative condition of his lumbar spine with associated lumbar disc protrusions on the right at L3/4, and associated spinal canal stenosis at L3/4 and L4/5. He is of the view that Mr PG's spine was stable.

- Mr PG had considerable comorbidities.

- In light of the above, the two planned operations conducted over two days were inappropriate in Mr PG's case.

- Had Mr PG's pain been so distressing that analgesic and opioid drugs did not control the situation, then he is of the view that the appropriate operation was a simple laminectomy and lateral discectomy on the right at L3/4.

Whilst Dr Atkinson expressed concern as to Mr PG's capacity to consent to the operation conducted given his speech and cognitive difficulties associated with his Parkinson's disease, he did acknowledge that he did not have sufficient clinical information to reach a definitive conclusion.

Dr Atkinson notes that the complication of a retroperitoneal haemorrhage is well-known by spinal surgeons, who carry out procedures, such as an XLIF. He highlights that with this procedure, there is the possibility of damage to major vessels, such as the inferior vena cava or the aorta, as well as the possibility of damage to feeding arteries and veins.

Accordingly, Dr Atkinson is of the view that the possibility of a retroperitoneal haemorrhage due to an operative complication should have been identified in Mr PG's case on 27 April when there was clinical evidence of abdominal pain, distension and bloating. He is also of the view that anticoagulants were contraindicated on or after 27 April. Dr Atkinson questions why an angiogram was not performed on 27 April, although he does acknowledge that the ICU staff considered the possibility in early May, however, felt that it was inappropriate due to Mr PG's apparent renal failure. He questions why a CT scan of the abdomen was not carried out on 27 April rather than 1 May, and is of the view that appropriate action should have been taken on 27 April. Dr Atkinson notes that the retroperitoneal haemorrhage was evident to the teams, as headed by Dr LT, as from 2 May, however, no intervention was advanced for the progressive blood loss. He is of the view that Mr PG's management was therefore a concern.

Specialist in Intensive Care Medicine and Anaesthesia, Associate Professor Peter Kruger

On 26 April 2015, Deputy Director and Senior Specialist at Princess Alexandra Hospital Intensive Care Unit, Associate Professor Peter Kruger provided an expert opinion in relation to the care and treatment Mr PG received whilst in the ICU at the private hospital.

Associate Professor Kruger shares the opinion expressed by Dr Atkinson regarding the management of Mr PG in the early post-operative period. He notes that Mr PG's clinical course post-operatively suggests that an abdominal CT scan prior to 1 May 2013 may have been appropriate. He also questions the use of subcutaneous Heparin as a prophylaxis

against DVT, as this can increase the risk of bleeding and may have been a contributing factor to his renal impairment. Associate Professor Kruger does acknowledge that this anticoagulation therapy was appropriately stopped on Mr PG's admission to the ICU. Professor Kruger agrees with the ICU clinician's decision to delay diagnostic imaging following ICU admission, due to the risk of intravenous contrast worsening his renal condition. He is of the view that given Mr PG's haemodynamic parameters were relatively stable and his haemoglobin level could be maintained with periodic transfusion, this suggests that the observation and supportive care provided in the ICU was appropriate. Associate Professor Kruger is also of the view that Mr PG's blood loss likely occurred slowly. He notes that during his ICU stay he was appropriately treated with both intravenous fluid and blood transfusion to manage any ongoing fluid loss. Ultimately, Associate Professor Kruger opines that whilst some elements of Mr PG's management during his stay on the ward before his transfer to ICU could have been optimised, he agrees that the decision in ICU to focus on supportive care and not to embark on additional imaging was appropriate.

Clinicians' response to expert reports

In response to the concerns raised by Dr Atkinson and Associate Professor Kruger, clinicians involved in Mr PG's care and treatment were provided with the opportunity to respond.

Dr JR agrees with Associate Professor Kruger's conclusions in relation to the treatment provided whilst Mr PG was in the ICU.

Dr AP, who assessed Mr PG at the request of Dr LT on 2 May, was unable to provide an explanation as to why an abdominal CT scan was not performed prior to 1 May. Whilst he notes that this is normal practice for a post-operative patient to be prescribed Heparin, as he was not responsible for commencing such medication in Mr PG's case, he is unable to explain the reasoning.

Dr LT's response

On 7 November 2016 Dr LT provided a response in relation to the concerns expressed by both of the experts.

Relevantly, Dr LT states the following:

- Mr PG was admitted to the private hospital on 28 March 2013 under the care of Endocrinologist Dr SN with lower back pain, right-sided sciatic pain and recurrent falls. He was subsequently referred to the Rehabilitation Unit, however due to the severity of his condition it was found that rehabilitation was not an option. An opinion was therefore sought from Orthopaedic Spine Surgeon, Dr LM and then himself.

- As Mr PG was not suitable for rehabilitation, and other past treatments including CT guided nerve root sheath block and epidural performed on 19 November 2012, 21 March 2013, 26 March 2013 and 5 April 2013, had failed, and he was experiencing increased difficulty mobilising, consideration was then given to surgery. Dr LM was approached for an opinion, following which he recommended surgery. A second opinion was sought from himself (Dr LT) and he also agreed that the surgery was appropriate.

- He first saw Mr PG on 15 April 2013 and then again on 17 April 2013. On each occasion, Dr LT discussed both operative procedures with him and his family. They were also referred to the NuVassive website for further information. Possible complications of the surgery were also discussed. Mr PG and his family were happy for the surgery to proceed.

- In relation to his reasoning for performing the surgery in two stages, Dr LT notes that this is often more physiologically tolerant for the patient. This would also allow any complications experienced following the first procedure to be dealt with prior to performing the second procedure.

- He explained that his decision to carry out the surgeries on Mr PG was based upon the clinical features, failure of conservative treatment, failure of nerve root sheath block, failure of epidural and failure of rehabilitation as well as the pre-operative assessment by Dr McN, Anaesthetist, who confirmed by way of medical notes on 23 April 2013 that Mr PG had recently failed rehabilitation at a private hospital.

- He disagreed with Dr Atkinson's opinion that a lumbar discectomy or laminectomy would have adequately treated Mr PG's pathology. He notes that the indications for surgical treatment were grade 1 L3/4, grade 1 L4/5 degenerative listhesis, and severe L3/4 and L4/5 canal and foraminal stenosis. This was associated with right L3/4 disc protrusion, with evidence of nerve root impingement. There were also signs of spinal canal stenosis and an unstable spine. Dr LT notes that known complication associated with simple discectomy and simple laminectomy, and with Mr PG's pre-operative MRI scan findings, is that following decompressive laminectomy the spine can become even more unstable. He would have then required more surgery, which Dr LT did not think was a good option. His decision to stabilise the spine, decompress the spinal canal, and the nerve root through the surgery was therefore the optimal option for Mr PG.

- He notes that both stages of the surgery were uneventful. The XLIF was done so whilst Mr PG was in the park bench position, with the use of image guidance. A minimal access approach (keyhole) was utilised. An intraoperative CT scan was used during the second stage of surgery. A post-operative CT scan was also conducted immediately following surgery, which did not show evidence of any haemorrhages or other complications associated with the surgery.

- Given Mr PG was in hospital for some time prior to the procedures, he was at significant risk of developing a post-operative DVT/pulmonary embolus. Having considered his various comorbidities, including renal failure, Dr LT recommended that Mr PG commence Heparin subcutaneously on 27 April 2013.

- When he reviewed Mr PG on 27 April he noted that his haemoglobin had dropped post-operatively due to blood loss from the operation on 25 April. Two units of blood were transfused and his haemoglobin improved by 28 April. No complaints of any increased abdominal pain or pain in the left groin area were noted at that time. It was only later that evening that these issues were raised. All other vital signs that evening were otherwise stable. As he had not had a bowel movement for 5-6 days, a decision was made to perform an abdominal x-ray, which took place on 28 April. This showed a moderate degree of faecal loading, for which he was given a laxative. A further x-ray was conducted on 30 April which showed that the faecal loading had been resolved. As Mr PG continued to complain of abdominal pain, and his haemoglobin dropped again, an abdominal and pelvic CT scan was arranged, which took place on 1 May. These tests confirmed that he had left-sided retroperitoneal haemorrhage.

- Following discovery of the retroperitoneal haemorrhage, discussions were had with Dr AP and Dr SN. Due to the risk associated with compartment syndrome and the development of a DVT or pulmonary embolism, it was felt important to discuss this matter with an expert. Accordingly, advice was sought from Urologist, Dr JP. The decision was then made for Mr GP to stop the Heparin therapy on 1 May.

Dr LT disagrees with Dr Atkinson's opinion that the surgery he performed on Mr PG was inappropriate or in any way radical. He maintains that Mr PG's quality of life was deteriorating due to his condition, and the surgery undertaken was appropriate. He also disagrees with the concerns raised by Dr Atkinson as to Mr PG's ability to make a decision in relation to the surgery. Dr LT had two meetings with him and his family where all of the relevant information was provided so as to enable them to make an informed decision. At no point did he consider that Mr PG did not have the capacity to make a decision about his health.

Conclusion

Mr PG was 75 years old when he died on 7 May 2013 as a result of retroperitoneal haemorrhage following lumbar spine surgery. Mr PG's clinical presentation was clearly complex. He suffered from a number of comorbidities, and had failed recent rehabilitation treatment provided for chronic, ongoing back pain associated with degenerative disease of the lumbar spine. Subsequent tests and imaging confirmed the extent of the condition, which was then treated operatively by Dr LT during a two-stage lumbar surgery.

Dr Atkinson raises concerns as to the appropriateness of the surgery conducted by Dr LT, which he refutes. I accept that Mr PG had a challenging clinical presentation, and that it is commonplace for there to be a difference in opinion amongst surgeons as to the optimal course for a patient. I am satisfied that Dr LT considered Mr PG's clinical presentation, particularly his deteriorating quality of life following recent rehabilitation and treatment failings, when determining what operative course was most appropriate. From the medical records, it appears that Dr LT did adequately discuss with Mr PG and his family the reasons for recommending the two-stage surgical procedure as well as its possible complications.

While the retroperitoneal haemorrhage which ultimately caused Mr PG's death was not identified for some six days following spinal surgery, other possible causes of his abdominal pain and distension were explored and treated. Both surgeries were uneventful and post-operatively a CT scan was conducted on both occasions which showed no evidence of haemorrhage. Once Mr PG's faecal loading, which was initially thought to be the cause of his abdominal discomfort, was addressed, further sources were then considered. It was at this point that the haemorrhage was identified.

While I am satisfied that the care and treatment provided to Mr PG following his transfer to the ICU was appropriate, some elements of his post-operative management before transfer could have been improved. While earlier identification of Mr PG's haemorrhage may have allowed for the commencement of earlier intervention measures, I find that in the circumstances, the care and treatment provided to Mr PG did not fall below the standard reasonably expected of a medical practitioner.

I am of the opinion my investigation into the death of Mr PG would not be further advanced by proceeding to inquest. I therefore close my investigation.

James McDougall
Southeastern Coroner
Southport
24 May 2017