



## FINDING OF INQUEST

*An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> days of March 2013 and the 30<sup>th</sup> day of September 2013, by the Coroner's Court of the said State, constituted of Mark Frederick Johns, State Coroner, into the death of Pasquale Giannini.*

*The said Court finds that Pasquale Giannini aged 68 years, late of 279 Nicolson Avenue, Whyalla Stuart, South Australia died at the Royal Adelaide Hospital, North Terrace, Adelaide, South Australia on the 12<sup>th</sup> day of November 2010 as a result of infarction of the small and large bowel due to superior mesenteric artery thrombosis. The said Court finds that the circumstances of his death were as follows:*

### **1. Introduction and cause of death**

1.1. Mr Pasquale Giannini was 68 years of age when he died in the Royal Adelaide Hospital (RAH) on 12 November 2010. A pathology review was conducted by Drs McIntyre and Gilbert of Forensic Science South Australia<sup>1</sup>. They gave the cause of death as infarction of the small and large bowel due to superior mesenteric artery thrombosis, and I so find.

### **2. Mr Giannini's medical history**

2.1. Mr Giannini had a medical history including hypertension, Type 2 diabetes, ischaemic heart disease with coronary artery stents, hypothyroidism and left carotid endarterectomy. It is important for the purposes of this case to put Mr Giannini's medical history in a proper context. The expert witness in this case, Dr Bessell, who is a gastrointestinal surgeon and who gave evidence, said that Mr Giannini had well

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<sup>1</sup> Exhibit C2a

established systemic vascular disease. His previous history of cardiovascular disease was evidenced by his previous coronary angioplasty to the right coronary artery in the year 2000. He also had peripheral vascular disease and that was evidenced by the fact that he had documented blockages or stenoses in his superficial femoral arteries. These arteries supply the leg and those blockages caused him intermittent claudication or pain in the calves on walking. Mr Giannini also had cerebrovascular disease which was evidenced by the fact that he had required a carotid endarterectomy. His comorbidities of diabetes, high blood pressure, mixed pattern dyslipidaemia and cigarette smoking are all conditions widely acknowledged to cause and accelerate systemic vascular disease<sup>2</sup>. Dr Bessell provided a report on his opinion of Mr Giannini's treatment<sup>3</sup> and several articles dealing with the subject of acute mesenteric ischaemia<sup>4</sup>.

- 2.2. In July 2010 Mr Giannini had been reviewed by Dr Raptis (vascular surgeon), Dr Peter Windsor (physician and endocrinologist) and Dr Straznicky (cardiologist) as recently as September 2010. At that time his arterial vascular disease was considered stable. Between March and November 2010 Mr Giannini had 19 contacts with his local general practitioner, mostly for prescriptions and other minor ailments.

### **3. The circumstances leading to Mr Giannini's death**

- 3.1. Mr Giannini's first presentation for the condition that ultimately led to his death was on 30 October 2010 when he presented at the Whyalla Hospital. He complained of abdominal pain after lunch saying that it was a burning type pain, that he felt nauseated and that he had two loose bowel motions that day. These symptoms were described by Dr Bessell in evidence as non-specific<sup>5</sup>. Mr Giannini presented to the Whyalla Hospital later that day. He was still complaining of the same pain he had experienced earlier in the day. He was provided with augmentin duo, an antibiotic, and nexium which is an antacid medication. He was also given De-Gas or simethicone. He was advised to follow-up with his regular general practitioner. Again, this presentation was described by Dr Bessell as one involving non-specific symptoms. He noted that the treatment provided was symptomatic<sup>6</sup>.

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<sup>2</sup> Transcript, pages 203-204

<sup>3</sup> Exhibit C11a

<sup>4</sup> Exhibit C11b

<sup>5</sup> Transcript, page 205

<sup>6</sup> Transcript, page 206

3.2. Mr Giannini did attend his general practitioner on 1 November 2010 and saw Dr Issah who gave evidence at the Inquest. He complained to Dr Issah of burning pain all over the abdomen which had started two days before. Dr Issah noted that he had attended at the hospital and been provided with De-Gas, nexiom and augmentin. Dr Issah examined Mr Giannini and Mr Giannini pointed to the suprapubic and lower quadrants of the abdomen as the source of the pain. Dr Bessell said that this was still non-specific in his opinion<sup>7</sup>. Dr Issah noted that no tenderness was felt, nor any mass evident. He prescribed zantac and a CT abdomen was arranged for the following day with a request to 'rule out AAA'<sup>8</sup> or other pathology. Dr Bessell regarded this as appropriate treatment by Dr Issah<sup>9</sup>. A CT scan was carried out the following day and the radiologist's report dated 2 November 2010 was as follows:

'Two small lesions in right lower lobe of liver. Likely benign cysts. Spleen normal. There is a heavy calcified gallstone measuring approximately 11mm towards the gallbladder neck. Gallbladder is not abnormally distended, no wall thickening. Gastric outline is normal. The appendix appears to be present and is normal. The aorta is of normal calibre 14mm. Atherosclerotic wall thickening is present. The IMA is of quite generous calibre and there is mural thrombus present. I do note that the origin of the SMA showed reasonably poor enhancement and may well be chronically thrombosed.

Impression: Normal abdominal aortic calibre. Poor contrast enhancement in the origin and proximal segment of the SMA ?thrombotic occlusion. There is a large calibre IMA, possible compensatory. There are well developed arterial collaterals between the SMA and IMA and celiac axis. Solitary gallstone. No acute inflammation of gallbladder.'

3.3. Mr Giannini returned to Dr Issah the same day. Dr Issah noted on Mr Giannini's medical record that the CT showed:

'Nil abnormality but he has a solitary gallstone at the neck of the gallbladder. It would appear that obstruction to the gallbladder neck may be responsible for his symptoms.'<sup>10</sup>

Dr Issah wrote a letter of referral to Dr Mike Damp, a surgeon, for cololithiasis, and prescribed buscopan as required for Mr Giannini.

3.4. When commenting on the CT scan Dr Bessell remarked that there was a low flow state in the superior mesenteric artery. He referred to the compensatory dilation or expansion of another vessel nearby, namely the inferior mesenteric artery. Dr Bessell noted the reporting of well developed collaterals and said that those are vessels

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<sup>7</sup> Transcript, page 207

<sup>8</sup> Abbreviation for abdominal aortic aneurysm

<sup>9</sup> Transcript, page 207

<sup>10</sup> Exhibit C5

joining the superior mesenteric artery and the inferior mesenteric artery. Dr Bessell said these could be described as ‘detours’ to allow blood to supply parts of the intestines that might have been compromised by a low flow state in the superior mesenteric artery. He noted that dilated vessels and collaterals are something that takes a considerable time to form and that it does not occur acutely<sup>11</sup>. Dr Bessell’s impression was that the radiologist was attempting to demonstrate that he felt that the vessel may be chronically thrombosed.

- 3.5. In his evidence Dr Issah said that he was reassured by what he understood to be good blood flow to the bowel and the fact that the problem was chronic rather than acute. Dr Bessell took issue with that interpretation noting that the report does not state that there was good blood flow to the bowel, merely that there was an alternative source of blood supply. However, Dr Bessell thought that it was quite reasonable for Dr Issah to attribute Mr Giannini’s pain to the solitary gallstone that had been identified in the CT scan.
- 3.6. Dr Bessell also thought it reasonable for Dr Issah to refer Mr Giannini to a surgeon.
- 3.7. On the same day, namely 2 November 2010, Mr Giannini presented in the Emergency Department at Whyalla Hospital after his appointment with Dr Issah. As it happened, Dr Issah was the doctor on duty in the Emergency Department at the time and he attended to Mr Giannini. Dr Issah provided Mr Giannini with some oral opiate pain relief. He had already initiated a referral to a specialist and he had a working diagnosis of gallbladder pain and it was Dr Bessell’s opinion that Dr Issah’s approach was not unreasonable.
- 3.8. Mr Giannini’s next contact with any medical practitioner was with Dr Issah on 5 November 2010 when he presented, describing his pain as ‘unbearable’. Indeed, he said that he had been suffering from unbearable pain and diarrhoea for three days. Dr Bessell was initially of the opinion that on this occasion Mr Giannini required prompt specialist opinion and hospitalisation. Although that did not occur, I did not take Dr Bessell to be strongly critical. The fact of the matter was that Mr Giannini was to see a specialist surgeon, Miss Hepworth, on 9 November 2010 because Dr Damp was not available. Bearing in mind that these events occurred in a regional community, it is difficult to see that a more immediate response could have been obtained.

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<sup>11</sup> Transcript, page 208

Furthermore, it is not obvious to me that an earlier referral at this point to Miss Hepworth would have avoided the ultimate tragic outcome.

- 3.9. Dr Bessell was of the opinion, with the aid of hindsight, that on 5 November 2010 Mr Giannini was experiencing what Dr Bessell described as crescendo mesenteric angina. He added:

'... which essentially means, in retrospect, with all the available evidence that I considered, I believed at that point in time he had a parlously low flow state in his mesenteric vessels and that the pain he was experiencing was not in fact from gallstones, I believe it was coming from bowel ischaemia.'<sup>12</sup>

- 3.10. Dr Bessell noted that had a medical specialist concluded at that time that Mr Giannini was experiencing pain from mesenteric ischaemia, which was in his opinion by no means a certainty<sup>13</sup>, that they may have arranged a review of a vascular surgeon who may or may not have reached the same opinion<sup>14</sup>. However, if those circumstances had occurred, then Dr Bessell said that successful treatments would have been available for the vascular surgeon to consider. Furthermore, had he been treated and blood flow successfully restored at that point, it was Dr Bessell's opinion that there was a 90% chance that Mr Giannini's bowel would not have been affected at that point.
- 3.11. Mr Giannini's next contact with any medical practitioner was on 9 November 2010 when he consulted Miss Hepworth in her consulting rooms. Miss Hepworth took a history from Mr Giannini and was aware of the medications he had been prescribed in the previous ten days. She examined him and the examination did not provide any real clue as to the cause of Mr Giannini's pain. She decided to perform an endoscopy investigation on Mr Giannini the following day. This approach was considered by Dr Bessell to be reasonable<sup>15</sup>. Dr Bessell commented that this was an attempt to refine the diagnosis and exclude other causes of the pain and doing an endoscopy to look for a peptic ulcer was not an unreasonable test.
- 3.12. An endoscopy was indeed performed on 10 November 2010. Miss Hepworth found a small superficial ulcer in Mr Giannini's stomach.

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<sup>12</sup> Transcript, page 214

<sup>13</sup> Transcript, page 216

<sup>14</sup> Transcript, page 217

<sup>15</sup> Transcript, page 218

- 3.13. Following the endoscopy and after meeting the requirements for discharge, Mr Giannini was sent home. However he was readmitted via ambulance to the Whyalla Hospital at 1643 hours that day. Dr Bessell summarised the situation to this point as follows:

'By the time Mr Giannini was readmitted to Whyalla Hospital on 10 November at 1643 hours he had been suffering 10 days of unrelenting abdominal pain, which was associated with some other mild gastrointestinal symptoms such as sporadic vomits and diarrhoea. Clinical examination and observations were within normal limits. The picture was non-specific, but with the aid of retrospect the patient was suffering from crescendo mesenteric angina, which subsequently developed into acute mesenteric ischaemia (AMI).'<sup>16</sup>

- 3.14. On his arrival at the hospital nursing staff promptly contacted Miss Hepworth. She ordered a dose of subcutaneous morphine pending her review of Mr Giannini in person. Miss Hepworth gave evidence that she saw Mr Giannini in the Emergency Department sometime after 5pm. She said that she was surprised that he was in so much pain. She said that at that time she did not have mesenteric ischaemia in her contemplation. The notes of Miss Hepworth's review indicated that she was happy to let Mr Giannini eat. It follows from this that she was not contemplating surgery at that time. Overall, it is plain that at that time Miss Hepworth had no plan to do anymore than assess and manage Mr Giannini's pain. She had no plan to investigate its cause at that point.
- 3.15. During the course of that evening, Miss Hepworth was contacted by nursing staff to inform her that Mr Giannini's pain was increasing and he had been unable to open his bowels<sup>17</sup>. Miss Hepworth gave an order for a fleet enema and that was subsequently administered by Nurse Clark at 9:35pm. Nurse Clark's evidence was that the enema produced very little and certainly no relief of Mr Giannini's pain.
- 3.16. At approximately 10pm Nurse Clark contacted Miss Hepworth again following a large vomit by Mr Giannini. Miss Hepworth reviewed Mr Giannini at approximately 11pm. The significant finding by Miss Hepworth was that Mr Giannini's abdomen at that time was soft and non-tender. This seems to be at odds with nursing observations to the effect that Mr Giannini's abdomen was distended and firm to touch. However, it may be that the abdomen had become slightly softer following the vomit.

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<sup>16</sup> Exhibit C11a

<sup>17</sup> Exhibit C6

- 3.17. Following the consultation at 11pm Miss Hepworth ordered an antiemetic. She order IV fluids and IV pantoprazole and ordered a sleeping tablet for Mr Giannini.
- 3.18. Nurse Clark gave evidence that following the administration of the pantoprazole Mr Giannini suffered a shaking episode<sup>18</sup> and at this time Nurse Clark decided that Mr Giannini should be transferred to the High Dependency Unit. Her reason for this was that Mr Giannini could be more closely monitored in the High Dependency Unit and that Mr Giannini had been occupying almost all of her attention to that point and she had other patients to nurse during the nightshift. Both Nurse Clark and Nurse Lawson, who was the High Dependency Unit nurse who received Mr Giannini, said that the transfer was not due to a deterioration in Mr Giannini's condition, but was actually due to his need for closer attention and the need to free nursing staff for other patients in the transferring ward.
- 3.19. Nurse Lawson attended to Mr Giannini in the High Dependency Unit. She gave evidence that he remained in a great deal of pain and in a highly anxious state<sup>19</sup>. She carried out hourly observations which showed Mr Giannini to be both tachycardic and hypertensive. She also instigated measurements of Mr Giannini's girth. Nurse Lawson administered additional morphine as needed during the course of her shift. She said that following such a dose of morphine at 4:30am Mr Giannini was observed to sleep for a short period.
- 3.20. It was Dr Bessell's opinion that following Miss Hepworth's review of Mr Giannini shortly after 5pm on 10 November 2010, she should have constructed a differential diagnosis. He said that he would expect such a list to include gallstones, a gastric ulcer and mesenteric ischaemia amongst the differential diagnoses. Dr Bessell's opinion was that his priority would have been to get to the root of what had been many days of abdominal suffering. Dr Bessell used the expression that it was necessary to draw a line in the sand and get to the bottom of this man's suffering. Dr Bessell was of the opinion that mere symptomatic management of Mr Giannini's pain on the evening of 10 November 2010 was inappropriate. It was his opinion that the evening of 10 November 2010 represented the final opportunity to intervene to save Mr Giannini's life.

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<sup>18</sup> Transcript, page 55

<sup>19</sup> Transcript, page 68

3.21. Miss Hepworth next saw Mr Giannini at approximately 8:30am on 11 November 2010. By this stage Miss Hepworth had formed the suspicion that Mr Giannini did have mesenteric ischaemia. She ordered blood tests and a further CT scan which she marked as urgent. The request for CT scan contained the following:

'? Mesenteric ischaemia' <sup>20</sup>

3.22. The bloods that Miss Hepworth ordered were collected at 8:40am that day, but the CT scan did not take place until shortly after midday and was not reported until 12:45pm.

3.23. Miss Hepworth said that she communicated some degree of urgency to the Radiology Department. However, there was some considerable delay before the CT was done. Unfortunately, on the information available to me at the Inquest it was not possible to determine the reason for this. In any event, on Dr Bessell's evidence, any intervention after 8:30am that day was not likely to have saved Mr Giannini's life.

3.24. It was Dr Bessell's opinion that the CT scan should have been done within an hour to an hour and a half<sup>21</sup>.

3.25. The CT scan when it came reported distended upper and mid small bowel which was interpreted as suggesting a distal small bowel obstruction. Dr Bessell made the following comments about this:

'That is a finding that can represent blockage of the bowel. Blockage of the bowel can be caused by a number of different causes, probably irrelevant to the doctor's differential diagnosis at this point in time. Obstruction by cancer, by kinking from bowel adhesions. Although not mentioned here, these appearances, in my opinion, actually don't represent a distal small bowel obstruction, in my opinion, with the aid of retrospect and knowledge of what happened after this, these appearances were actually that of what is called an ileus. An ileus is essentially an obstruction of the bowel, but an adynamic obstruction of the bowel; an obstruction of the bowel because the bowel is not actually squeezing the food and fluid through. It is laying there fallow, so to speak, and it's laying there fallow because it was dead or dying.'<sup>22</sup>

3.26. Miss Hepworth noted the findings of the CT scan and arranged for Mr Giannini to be transferred to the RAH. Mr Giannini was collected by the Royal Flying Doctor Service at 1850 hours. Once at the RAH Mr Giannini underwent an urgent laparotomy that evening. The surgeon who undertook the procedure found necrotic

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<sup>20</sup> Exhibit C9c

<sup>21</sup> Transcript, page 225

<sup>22</sup> Transcript, page 226

small bowel which was resected with the hope that some of it could be saved, however during this process more necrotic tissue was found. Further resection of the bowel was deemed incompatible with life and the decision was made to close the abdomen and provide Mr Giannini with comfort care. Mr Giannini died at 1630 hours the following day, 12 November 2010.

#### **4. Conclusions**

##### **4.1. Dr Bessell concluded his opinion as follows:**

'Acute mesenteric ischaemia is an important, life threatening surgical problem that is encountered commonly in elderly women with multiple comorbid conditions and risk factors for advanced atherosclerotic disease. This condition might occur as a consequence of acute thrombosis of a pre-existing mesenteric artery stenosis or as a result of embolisation from a proximal arterial or cardiac source. Thus, this patient group harbors coexisting conditions such as were in evidence with Mr Giannini. When symptomatic mesenteric ischaemia progresses to bowel necrosis, the overall mortality of the condition, according to several reports, exceeds 70%.

Efforts to detect mesenteric vascular occlusion before the development of bowel necrosis have been frustrated by the fact that symptoms and physical findings to suggest the diagnosis are variable and overlap with many other conditions (ie. non specific). The classic clinical presentation is described by Hirsch and colleagues: The clinical findings consist of severe abdominal pain of relatively sudden onset that is not localised. The pain is frequently perumbilical indicating its origin in the small bowel. Classically, the pain is described as "out of proportion to the physical findings". This situation occurs because the ischaemic process does not result in transmural necrosis early in its course and, therefore, the peritoneal irritation which is the cause of localised abdominal tenderness is a late finding which is not seen in patients with acute mesenteric ischaemia until transmural necrosis of the intestine has already occurred. Other symptoms and signs are also non-specific. Diarrhoea or constipation might be present.

Diagnostic delay, therefore, is a major challenge and is the reason for the oft repeated observations made by clinicians that the diagnosis is not made until abdominal tenderness and haemodynamic instability have occurred, signalling that the extent of intestinal necrosis has placed the patient in a high mortality risk category, heralding a commonly fatal outcome. The case of Mr Giannini illustrates the non-specific nature of the condition and the normality of examination findings unfortunately very well, and it is therefore very important to strongly bear in mind that in this regard, the doctors looking after Mr Giannini were no different than legions of their colleagues who have had patients suffer a similar outcome over many generations. I believe many clinicians would agree that premorbid diagnosis of acute mesenteric ischaemia to be the exception rather than the rule.

Hirsch et al also point out that laboratory studies and abdominal XRays also offer little in the way of useful diagnostic findings. Leucocytosis and lactic acidosis might be present but these are also late signs indicating progression to transmural intestinal necrosis. The

diagnosis of mesenteric artery occlusion can be confirmed with imaging studies including colour flow Doppler imaging, CT angiography, contrast enhanced MRI, and conventional contrast angiography. The majority of these are not available in Whyalla. However CT scanning in patients with acute mesenteric ischaemia may show thickening of the bowel wall, early pneumatosis, and free abdominal fluid that might raise the suspicion that mesenteric vascular occlusion has occurred and contrast enhanced CT angiography could confirm the diagnosis.'<sup>23</sup>

- 4.2. I have commented that Dr Bessell was mildly critical of Miss Hepworth not having constructed a differential diagnosis when Mr Giannini was readmitted to the hospital on the afternoon of 10 November 2010. For her part Miss Hepworth said that she still thought that the ulcer was responsible, although she did consider that 'this was a lot of pain for somebody with an ulcer'<sup>24</sup>. However, she made it quite plain that at that time she did not consider mesenteric ischaemia was a likely diagnosis. It seems to me that even if Miss Hepworth had constructed a list of differential diagnoses at that point, it would not have included mesenteric ischaemia on her evidence. I do not take Dr Bessell to be suggesting that it should have. When asked about this, Dr Bessell said in evidence:

'The counsel of perfection is to have an index of suspicion of the condition, to attempt to exclude alternative diagnoses but also to pursue investigations to try to diagnose acute mesenteric ischaemia.'<sup>25</sup>

When asked directly by counsel for Miss Hepworth why she should have an index of suspicion for possible mesenteric ischaemia that evening, Dr Bessell said:

'I'm not saying she should have. I'm saying it's a counsel of perfection that doctors would have that as an index of suspicion and pursue that line of investigation. But as I've made the point in the closing remarks of my evidence, it's unfortunate that that is not common for doctors to have that index of suspicion nor act on it in a timely manner because of the difficulties of diagnosis.'<sup>26</sup>

- 4.3. I do not take Dr Bessell to be critical of Miss Hepworth. Dr Bessell has very properly and fairly taken the opportunity to comment upon the extreme difficulties in making an early diagnosis. The ACC/AHA 2005 Practice Guidelines for the management of patients with peripheral arterial disease (lower extremity, renal,

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<sup>23</sup> Exhibit C11a

<sup>24</sup> Transcript, page 175

<sup>25</sup> Transcript, page 250

<sup>26</sup> Transcript, page 251

mesenteric and abdominal aortic)<sup>27</sup> kindly provided by Dr Bessell contain the following at page E560:

'Despite treatment, acute intestinal ischaemia caused by arterial obstruction is most often fatal. Various surgical series show both that treatment outcome has changed little during the past several decades and that mortality averages approximately 70%. The reason for this grim prognosis is found in the time course of the signs and symptoms of the disease. Because patients present initially with abdominal pain and few findings, diagnosis is often delayed. By the time the diagnosis is obvious because of an abdominal distension, perforation, shock, and so on, ischaemia is far advanced, and survival is doubtful, despite treatment.'

## 5. **Recommendations**

5.1. In the circumstances I have no recommendations to make in this matter.

*Key Words: Mesenteric Ischaemia; Hospital Treatment*

*In witness whereof the said Coroner has hereunto set and subscribed his hand and*

*Seal the 30<sup>th</sup> day of September, 2013.*

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*State Coroner*

Inquest Number 3/2013 (1771/2010)