Bariatric and Gastric Surgeon, Dr B

District Health Board (Te Whatu Ora)

A Report by the

Deputy Health and Disability Commissioner

(Case 19HDC01764)

Health and Disability Commissioner

Te Toihau Hauora, Hauātanga

Contents

Executive summary

1. This report concerns the care provided to a woman following gastric sleeve surgery. The case highlights the importance of assessing and managing a patient's nutritional status adequately, and recognising the risk of nutritional deficiency.

2. The gastric sleeve surgery was performed privately by a bariatric and gastric surgeon.

3. On 3 November 2018, approximately two weeks after the gastric sleeve surgery, the woman presented to the Emergency Department (ED) with vomiting and nausea, the cause of which was uncertain and unable to be diagnosed immediately. The initial impression was of some twisting of the lower end of the stomach remnant, but appendicitis was also suspected.

4. On 8 November 2018, the woman's appendix was removed. Following this, her symptoms resolved for a short period of time and she was discharged on 10 November 2018. However, she was then re-admitted to hospital on two subsequent occasions with ongoing symptoms of nausea and vomiting.

5. The woman was found to have developed a moderate post-gastric-sleeve stenosis and, following treatment, her symptoms of nausea and vomiting resolved.

6. On or about 23 December 2018, the woman began to experience progressive tingling and pain in her feet, legs, and hands, and was unable to move properly. She was re-admitted to hospital on 22 January 2019.

7. Because of the woman's prolonged nutritional deficiency relating to previous obesity, poor nutritional intake, the anatomical and functional changes caused by the bariatric surgery, and the lack of supplementation and macronutrients following the surgery, she developed polyneuropathy and required rehabilitation to assist her recovery.

Findings

8. The Deputy Commissioner considered that the surgeon did not assess and manage the woman's nutritional status adequately, and did not provide the necessary multivitamin supplementation. The Deputy Commissioner found that in the context of the woman's ongoing nausea and vomiting, the surgeon, as the responsible clinician, did not provide services with reasonable care and skill, in breach of Right 4(1) of the Code.

9. The Deputy Commissioner made adverse comments about the district health board (DHB) (now Te Whatu Ora), as multiple staff did not recognise the risk of nutritional deficiency, and did not identify and act on the woman's need for nutritional support and multivitamins, particularly in light of her gastric sleeve surgery and ongoing vomiting.

10. The Deputy Commissioner also made adverse comments about both the surgeon's and the DHB's clinical documentation, as the advice about taking multivitamins that was given to the woman at discharge was not documented in the clinical records.

Recommendations

11. The Deputy Commissioner recommended that the surgeon provide a formal written apology to the woman for the deficiencies in care outlined in this report.

12. The Deputy Commissioner also recommended that the surgeon continue to adopt the practice of providing patients who have had bariatric surgery with a three-week course of thiamine, advising patients to start taking multivitamins as soon as they are able to tolerate these after surgery, seeking the advice of a dietitian for patients who have had disrupted oral intake for more than five days, and giving patients who are admitted to hospital an intra-muscular dose of multivitamins.

13. The Deputy Commissioner recommended that Te Whatu Ora provide a formal written apology to the woman for the deficiencies in care outlined in this report.

14. The Deputy Commissioner also recommended that Te Whatu Ora provide training to all clinical staff who were involved in the woman's care, and who are currently still employed by Te Whatu Ora, on the importance of assessing a patient's nutritional status, so that they are fully aware of the risk of micronutrient deficiency among patients who have had bariatric surgery, and that Te Whatu Ora use this report as a basis for staff learning.

15. Further, the Deputy Commissioner recommended that Te Whatu Ora review the quality of its clinical documentation to ensure that its staff record the advice given to patients at discharge accurately.

Complaint and investigation

16. The Health and Disability Commissioner (HDC) received a complaint from Ms A about the care provided by Dr B and the district health board (DHB) (now Te Whatu Ora[1]). The following issues were identified for investigation:

- *Whether Dr B provided Ms A with an appropriate standard of care in 2018 and 2019.*
- *Whether the district health board provided Ms A with an appropriate standard of care in 2018 and 2019.*

17. This report is the opinion of Deputy Commissioner Vanessa Caldwell, and is made in accordance with the power delegated to her by the Commissioner.

[1] On 1 July 2022, the Pae Ora (Healthy Futures) Act 2022 came into force, resulting in all district health boards (including the DHB) being disestablished and Te Whatu Ora — Health New Zealand being established in its place.

18. The parties directly involved in the investigation were:

Ms A	Consumer
Dr B	Provider/bariatric[2] and gastric surgeon
DHB	Provider

19. Further information was received from:

Ms C	Provider/nutritionist
Accident Compensation Corporation (ACC)	

20. Also mentioned in this report:

Dr D	Radiologist
Dr E	GP/ACC advisor

21. Independent expert advice was obtained from Dr Rowan French, a consultant general surgeon with an interest in bariatric and metabolic surgery (Appendix A).

Information gathered during investigation

Introduction

22. This report discusses the care provided to Ms A by Dr B and the DHB following gastric sleeve surgery.[3]

23. Approximately two weeks after the surgery, Ms A presented to the Emergency Department (ED) at a public hospital with vomiting and nausea, the cause of which was uncertain and unable to be diagnosed immediately. The initial impression was of some twisting of the lower end of the stomach remnant, but appendicitis was also suspected. Ms A's appendix was removed and, following this, her symptoms resolved for a short period of time. However, she was then re-admitted to hospital on two subsequent occasions with ongoing symptoms of nausea and vomiting. Ms A was found to have developed a moderate post-gastric-sleeve stenosis and, following treatment, her symptoms of nausea and vomiting resolved. However, because of Ms A's prolonged nutritional deficiency relating to previous obesity, poor nutritional intake, the anatomical and functional changes caused by the bariatric surgery, and the lack of supplementation and macronutrients after the surgery, she developed polyneuropathy[4] and required rehabilitation to assist her recovery.

[2] Bariatrics is a branch of medicine that deals with the causes, prevention, and treatment of obesity.
[3] Gastric sleeve surgery, or sleeve gastrectomy, is surgery for weight loss that involves the removal of a large part of the stomach.
[4] Malfunction of many of the peripheral nerves throughout the body. This can cause pain, discomfort, and difficulty in moving.

24. Ms A raised concern about the care she received from Dr B and the DHB following her gastric sleeve surgery. Ms A stated that she was most concerned about the "aftercare process" while she was under Dr B's care. She also raised concern that no dietitian input was requested when she was unable to manage an adequate diet or food intake after her first hospital admission on 3 November 2018, and when the anaesthetist noted that her potassium levels were low on 8 November 2019.

25. Ms A said that she was discharged from hospital repeatedly before proper treatment had occurred, resulting in an extensive treatment injury that was directly linked to her nausea and vomiting and the lack of nutritional care throughout her hospitalisations.

26. Ms A also questioned whether her appendix was removed unnecessarily, as her symptoms were not relieved following its removal.

Events prior to gastric sleeve surgery

27. Ms A first consulted Dr B privately on 14 December 2017 about gastric sleeve surgery.

28. Ms A told HDC that the risks of a twist in the gastric sleeve or vitamin deficiency were not discussed with her. However, Dr B has a different recollection.

29. The consent form noted that the risk of "stricture"[5] was discussed with Ms A. Dr B advised that a gastric twist is a potential cause of a stricture, and that this was discussed in detail with Ms A, including the symptoms she might experience in the event of a stricture (caused by a gastric sleeve twist). Dr B provided HDC with a copy of the diagram that was drawn during the initial consultation with Ms A to assist with the explanation of a stricture.

30. Dr B stated that the need for multivitamins was also discussed with Ms A. Dr B said that every patient meets with a nutritionist prior to surgery, and the nutritionist spends "a significant proportion of the time" discussing the need for multivitamins in the postoperative period.

31. In preparation for her surgery, Ms A met with the nutritionist, Ms C, on 17 January 2018. Ms C provided Ms A with a nutrition booklet outlining a detailed plan of how her diet should be constructed after the surgery. Ms A was also provided with multivitamin information.

32. Ms C recommended that Ms A start taking bariatric multivitamins[6] and additional calcium three weeks after the surgery.

33. Following her consultation with Ms A, Ms C advised Dr B that she had discussed with Ms A her post-surgery nutrition and supplementation, and explained to her how she had to approach eating after the surgery to reduce the risk of nutrient deficiencies.

34. Ms C told HDC that she discussed the recommended supplement regimen with Ms A in detail at each appointment. Ms C stated that at every pre-surgery consultation she specifically

[5] An abnormal narrowing of a body passage.
[6] Bariatric-specific vitamins are absorbed better and cause less irritation than standard multivitamins.

advises patients that the three main areas of focus during the first 12 weeks after surgery are to increase their water intake, start their supplement regimen, and increase their protein. She said that this is re-emphasised at the follow-up nutrition appointment (which occurs 12 weeks after surgery). She stated that she emphasises to patients to start taking a multivitamin/mineral post-surgery, and to take it consistently (daily) to maintain their health status.

Surgery on 15 October 2018

35. Ms A's gastric sleeve surgery was performed privately by Dr B on 15 October 2018. There were no intra-operative concerns or complications. Ms A was scheduled to see Dr B for a follow-up appointment on 5 November 2018. (This appointment did not eventuate because Ms A was admitted to hospital, as discussed in further detail below.)

Hospital admissions following gastric sleeve surgery

36. Between 3 November and 28 December, Ms A presented to the public hospital three times. A summary of each presentation, including the working diagnosis, investigations, and discharge plan, is set out below.

First admission — 3–10 November 2018

37. Following the gastric sleeve surgery and up until 1 November 2018, Ms A had been tolerating a puréed diet and soft food.

38. On 3 November 2018, approximately two weeks after the gastric sleeve surgery, Ms A presented to the ED at the public hospital with vomiting and nausea. She was admitted to the General Surgery ward.

39. Ms A underwent a CT[7] scan of the abdomen and pelvis, which showed adequate passing of contrast[8] through the gastric cavity into the small bowel, and no evidence of any leaks. The scan report also noted thickening of the appendix that could be reflective of acute appendicitis.[9]

40. Dr B stated that with the information available at that time, it was considered less likely that a stricture or twist of the gastric sleeve was causing obstruction, but an obstructed sleeve was not excluded.

41. Further investigations were undertaken, including a barium swallow[10] on 6 November 2018 performed by radiologist Dr D. The test did not show any leaks, and Dr D's initial interpretation was of a mid-gastric twist. Dr B viewed and discussed the results of the barium swallow with Dr D, and it was agreed that Dr D's initial interpretation of the images taken during the test was incorrect, and that the most likely interpretation was some angulation (partial twisting) of the lower end of the stomach remnant.

[7] Computed tomography (used in radiology to obtain detailed internal images of the body).
[8] A dye used in some CT scans to highlight the areas of the body being examined.
[9] Inflammation of the appendix.
[10] An X-ray that allows a doctor to view the upper part of the bowel.

42. Dr B stated that the swallow study did not support the gastric sleeve being the cause of Ms A's symptoms, and Ms A underwent a further CT scan on 8 November 2018. This scan concluded that the appearance of the appendix was "in keeping with acute appendicitis without evidence of complication". As a result, Ms A's appendix was removed on 8 November 2018.

43. It was noted in the operation record that the tip of the appendix had an unusual appearance, and that there was possible appendicitis. The anaesthetist noted that Ms A's potassium levels were low,[11] and intravenous potassium was provided.

44. Following the removal of her appendix, Ms A's symptoms improved and she was managing a soft diet. She was discharged on 10 November 2018. The discharge plan was for Ms A to resume her regular post-gastric-sleeve diet, and for her to be seen by Dr B privately in a week's time. However, this appointment did not eventuate as Ms A was re-admitted to hospital.

45. Dr B told HDC that at discharge, Ms A was advised to start taking the multivitamins, as per the nutrition plan and information booklet she had received prior to her gastric sleeve surgery. However, this discussion was not recorded in the discharge letter, and no multivitamin prescription was provided to Ms A at discharge. Dr B told HDC that a prescription was not required because Ms A already had multivitamins at home.

Second hospital admission — 14 November to 6 December 2018

46. On 14 November 2018, Ms A was re-admitted to hospital under the care of Dr B's team with ongoing symptoms of nausea and vomiting. Ms A was referred to the gastroenterology team for an upper gastrointestinal (GI) endoscopy.[12]

47. On the same day, a CT scan of the chest and abdomen was completed, which showed no signs of obstruction.

48. On 23 November 2018, an upper GI endoscopy and balloon dilatation[13] was performed (Ms A's first balloon dilatation). The report showed oesophagitis[14] caused by Ms A's persistent vomiting, and a twist was seen in the mid-gastric body related to the gastric sleeve surgery. Following the balloon dilatation procedure, Ms A's symptoms gradually improved.

49. On 26 November 2018, Ms A advised Dr B by text message that she had not vomited since the endoscopy procedure on 23 November 2018, and that she had had her first puréed meal.

[11] Her potassium level was 3.0mmol/L (normal is 3.5 to 5.2mmol/L). Potassium is a mineral that conducts electrical impulses throughout the body and assists in essential body functions.
[12] A procedure to examine the upper GI tract, which includes the food pipe (oesophagus), stomach, and the first part of the small intestine (duodenum).
[13] Gentle stretching of a strictured area.
[14] Inflammation of the lining of the oesophagus.

50. On 4 December 2018, another barium swallow was performed to assess Ms A's progress. This showed that a partial twist remained in the body of her stomach, but that passage of the barium through the stomach was still occurring freely.

51. Ms A was able to resume her puréed diet, and her nausea and vomiting improved. At this point, the primary diagnosis was a post-gastric-sleeve twist. Ms A was discharged on 6 December 2018, to be followed up by Dr B in private.

52. Dr B told HDC that Ms A was discharged only once they, and Ms A, were confident that Ms A was able to tolerate a puréed diet, adequate water intake, and tablets. Dr B stated that on discharge, once again Ms A was advised to return to the usual post-gastric-sleeve diet and multivitamin supplements. Dr B said that Ms A had assured Dr B that she had a sufficient supply of multivitamins at home, and as Ms A had been a habitual user of multivitamins and other supplements prior to the gastric sleeve surgery, Dr B felt reassured by this.

53. The discharge summary contains no record of the advice given to Ms A in relation to her multivitamin intake.

54. Ms A acknowledged that she was aware that she had to take multivitamins two weeks after her surgery. She told HDC:

> "[Dr B mentioned] that I was to start taking vitamins two weeks post op, at this point of my post op journey I was already unwell and then in hospital being looked after by [Dr B] …"

55. On 8 December 2018, following her discharge from hospital, Ms A sent a text message to Dr B asking when she could start taking her multivitamins, to which Dr B replied: "[N]ow would [be] fine."

Third hospital admission — 11–28 December 2018

56. On 11 December 2018, Ms A was re-admitted to hospital with ongoing nausea and vomiting. Dr B arranged an urgent GI endoscopy and balloon dilatation, which was performed on 13 December 2018 (Ms A's second balloon dilatation). Some oesophagitis was seen, but no severe stenosis.[15]

57. Following the procedure, Ms A's symptoms of nausea and vomiting were still present, and there was concern that she might have a bowel obstruction.

58. On 17 December 2018, Ms A underwent another barium swallow. The report noted that Ms A had been tolerating fluids, but that she had had six episodes of vomiting in the preceding 24 hours. It was reported that the barium had passed freely through the oesophagus and gastric sleeve, and that there was a moderate narrowing in the mid-gastric body, but there did not appear to be high-grade stenosis or significant pooling of contrast.

[15] Narrowing.

59. On 19 December 2018, Ms A underwent another GI endoscopy and balloon dilatation (third balloon dilatation). The report noted a moderate stenosis, and that it appeared that previously the stenotic area had not been dilated effectively. During the procedure, a potassium tablet was retrieved from the sleeve proximal to the stenosis.

60. The primary impression at this point was that Ms A had developed a moderate post-gastric-sleeve stenosis.

61. It was recommended that the potassium tablets be stopped as they could cause significant ulceration,[16] and that a replacement be given.[17]

62. Following Ms A's third balloon dilatation procedure on 19 December 2018, her symptoms improved significantly, and she was discharged on 28 December 2018.

Subsequent events

63. On 29 December 2018, following Ms A's discharge from hospital, Dr B sent Ms A a text message, asking Ms A to get in contact by phone. Dr B's intention, as stated to HDC, was to discuss with Ms A her oral intake and confirm her multivitamin use.

64. Dr B stated that a follow-up text message was sent to Ms A two weeks later, with no response. Dr B said that the receptionist also called Ms A on 15 January 2019 to arrange a follow-up appointment, and messages were left for Ms A and emails were sent, none of which Ms A responded to.

65. Dr B stated that the inability to contact Ms A was a significant factor that prevented crucial information from being passed on to her regarding eating and supplementation.

66. Dr B said that usually during the first post-surgery consultation the plan is discussed with patients around building up to a normal diet, to ensure that multivitamins have been started. However, Ms A did not have a post-surgery consultation due to her hospital admission.

67. Dr B said that at three months post-surgery, usually a full range of nutrition blood tests will also be completed to check on vitamin and mineral levels. At this point, patients also see the nutritionist again to ensure that their diet is well balanced.

Development of vitamin deficiency

68. On or about 23 December 2018, Ms A began to experience progressive tingling and pain in her feet, legs, and hands, and was unable to move properly. She was re-admitted to hospital on 22 January 2019.

[16] Formation of an ulcer (an open, painful sore).
[17] K-Effervescent (a potassium supplement for people who do not get enough potassium from food) was recommended.

69. Ms A's primary diagnosis was polyneuropathy secondary to vitamin deficiency and a severe nutritional deficit. On 7 February 2019, she received rehabilitation to aid her neurological recovery, and she was discharged on 5 March 2019.

Further information

Ms A

70. Ms A told HDC that the aftercare she received from Dr B and the team was not one that had minimised harm. Ms A said that she should not have suffered a vitamin deficiency, and that she was already unwell two weeks after the gastric sleeve surgery, which was when she was meant to start taking the multivitamins. She stated: "[I]f [Dr B] was thorough enough and providing sufficient care, [Dr B] would have started me on [multivitamins] however, [Dr B] did not."

Dr B

71. Dr B was sorry that Ms A experienced significant complications that required further hospital admissions, investigations, and surgery. Dr B said that Ms A's case was complex, and the best was endeavoured in what were difficult circumstances.

72. Dr B told HDC that during Ms A's hospital admissions, the focus was on identifying the cause of her nausea and vomiting by doing numerous blood tests and investigations, including CT scans, swallow tests, and gastroscopies. The focus was also on restoring fluid and electrolyte balance, and performing therapeutic interventions, such as endoscopic dilatations, to restore oral intake. Dr B said that this had been achieved, as Ms A was tolerating fluids, soft food, and tablets at the time of each discharge.

73. Dr B maintains that at the time of each discharge, and once oral intake had been re-established, Ms A was advised verbally to start, or re-start, her multivitamins. Dr B stated that the importance of multivitamin use to prevent deficiencies was discussed with Ms A.

74. Dr B said that while Ms A was symptomatic in hospital, she was "profoundly nauseated" and unable to tolerate oral multivitamin supplementation. Dr B stated that if it had been considered that any resolution of oral intake would take longer than one week, dietitian input would have been considered with a view to starting total parenteral nutrition (TPN[18]).

75. Dr B explained that TPN is a less desirable option for a patient, as it requires insertion of a central line, which comes with risks such as sepsis, vascular injury, or blood clots. It also "ties a patient to a drip for long periods of time", making them less mobile with increased risks of lung dysfunction, infection, and deep vein thrombosis. Dr B stated that in retrospect, the introduction of intravenous or intramuscular administration would be sought sooner, as this likely would have prevented the resulting vitamin depletion.

[18] TPN supplies all daily nutritional requirements, and can be used in the hospital or at home.

76. Dr B also stated that it is very difficult to measure a person's thiamine[19] levels accurately. There is no reliable, one-off test for measuring thiamine levels, and it is not routine practice to test for thiamine deficiency either preoperatively or postoperatively.

DHB

77. The DHB recognised the distress suffered by Ms A and her whānau, and acknowledged the detrimental effect this experience has had on her, both physically and emotionally. The DHB stated that Ms A's postoperative circumstances were unusual, which resulted in stress and discomfort for her, and while it was disappointing to hear that the DHB had failed to meet a patient's expectations, in this case, it considers that it happened despite the care provided having met the required standard.

ACC

78. ACC obtained internal clinical advice from a general practitioner, Dr E, in the assessment of Ms A's treatment injury claim.

79. Dr E advised that supplementation of micronutrients and macronutrients is required after bariatric surgery in order to avoid nutritional deficiencies. She stated that even with an optimal, nutrient-rich and varied post-surgical diet, there is still a risk of deficiency due to the small amounts of food able to be consumed and the changes in nutrient absorption. She advised that nutritional deficiency is more likely than not to occur in patients who have had bariatric procedures. She said that she would consider this an expected outcome in most, if not all patients who have had this procedure, and therefore good nutrition and supplementation is "absolutely required" in order to avoid deficiencies.

80. Dr E noted that the obstruction caused by twisting of the stomach or intestine[20] would have limited Ms A's intake further, but, in her opinion, this was not the direct cause of the nutritional deficiency suspected to be the cause of the polyneuropathy.

81. Dr E advised that under normal circumstances, the body will have sufficient reserves to compensate for temporary reduction of dietary intake, even for a period of several weeks. She stated that polyneuropathy is not a condition that occurs acutely, and prolonged nutritional deficiency is needed before the condition develops to the point that nerve damage is apparent. In her opinion, Ms A's polyneuropathy was caused by prolonged nutritional deficiency relating to previous obesity, nutritional intake, the normal result of anatomical and functional changes caused by bariatric surgery, and the lack of supplementation and macronutrients after that surgery. Dr E stated that Ms A was already in a vulnerable position when the twisting of the stomach occurred, but that that in itself would not have been the direct cause of the polyneuropathy.

82. Dr E concluded that the polyneuropathy was not directly caused by the twisting of the stomach incident and/or stenosis. Rather, the nutritional deficiency thought to have led to

[19] Thiamine is a vitamin that plays a vital role in the growth and function of various cells. It cannot be made in the body, and is found in food and supplementation.
[20] Volvulus.

the polyneuropathy was a chronic process mainly caused by the underlying condition, poor nutritional intake, and the expected result of bariatric surgery.

Responses to provisional opinion

83. Ms A was given an opportunity to respond to the "information gathered during investigation" section of the provisional opinion.

84. Ms A told HDC that she was hospitalised and reliant on the medical team to prescribe vitamins, which did not occur. She said that she had lost faith in Dr B and that this was why she had presented to the ED for admission to the public system for treatment.

85. Dr B was given an opportunity to respond to the sections of the provisional opinion that relate to Dr B.

86. Dr B accepted the conclusion that Ms A's polyneuropathy, if caused by thiamine deficiency, could have been avoided by the initiation of alternative modes of supplementation during her admission. However, Dr B said that insufficient account has been given to the fact that following Ms A's discharges on 10 November and 6 December 2018, the treating team had been under the impression that Ms A had been taking her oral multivitamins, as she had been counselled to do at both discharges.

87. Dr B said that it was important to emphasise that Ms A was discharged only when, following the initial beneficial effect of each treatment (i.e., the removal of her appendix, and the first endoscopic balloon dilation), Ms A had regained confidence in her oral intake to the point that she was tolerating soft foods, fluids, and tablets. Dr B said that in this context, concerns about the possibility of a micronutrient deficiency were obviated by their understanding that Ms A's micronutrient levels were replenished by daily multivitamin use (as well as soft food/fluid intake) during the period of reprieve when she was out of hospital. Dr B said that in this context, it would be unnecessary to introduce the risks associated with more invasive modes of supplementation (e.g., TPN) to the equation.

88. Dr B reiterated sympathies to Ms A, and was sorry to read about the challenges Ms A has faced since events.

89. Dr B's comments have been incorporated into this opinion where appropriate.

90. Te Whatu Ora was given an opportunity to respond to the provisional opinion. It accepted the provisional findings.

Opinion: Dr B — breach

Introduction

91. First, I acknowledge the distress that these events have caused Ms A and her whānau. Following her gastric sleeve surgery, Ms A had multiple hospital admissions, during which she did not take multivitamins and developed polyneuropathy, which required extended hospital stays and rehabilitation. It is evident that this was a traumatic experience for Ms A.

92. I have undertaken a thorough assessment of the information gathered in light of Ms A's concerns, and I consider that the care provided by Dr B breached Right 4(1)[21] of the Code of Health and Disability Services Consumers' Rights (the Code). The reasons for my decision are set out below.

Assessment and management of nutritional status after gastric sleeve surgery — breach

93. I acknowledge that preoperatively Dr B told Ms A about the importance of multivitamin intake, and that Ms A was aware of this. The focus and key issue in this case is the assessment and management of Ms A's nutritional status during the repeated hospital admissions after her gastric sleeve surgery — a period of more than 40 days from her first hospital admission until the third balloon dilatation was performed and her symptoms finally resolved.

94. During the majority of this time, Ms A was troubled by nausea and vomiting, and had limited nutritional intake, but no multivitamin supplementation was provided to her.

95. Patients who have had gastric sleeve surgery are known to be at risk of vitamin deficiencies because of their restricted diet, and therefore need to take multivitamins on an ongoing basis. As advised by ACC's clinical advisor, Dr E, good nutrition and supplementation is "absolutely required" to avoid deficiencies.

96. I accept Dr E's view that Ms A's polyneuropathy was caused by prolonged nutritional deficiency relating to previous obesity, poor nutritional intake, the normal result of anatomical and functional changes caused by bariatric surgery, and the lack of supplementation and macronutrients after that surgery.

97. My expert advisor, Dr French, noted that there is a risk of B vitamin deficiency when vomiting is the main clinical issue. He stated that of these B vitamin deficiencies, thiamine (B1) may be the most important to recognise and treat, as it can cause irreversible neurological impairments.

98. Dr French considers it likely that Ms A's neurological symptoms were caused by thiamine deficiency, although other vitamin deficiencies may have played a part. He stated:

> "In my view, [Ms A] should have been prescribed multivitamin supplementation, probably during the first admission and definitely during the second and third

[21] Right 4(1) of the Code provides that every consumer has the right to have services provided with reasonable care and skill.

admissions. Failure to do so unfortunately represents a serious deficiency in her care. Oral supplements could have been trialled, but a better option would likely [have been] an intravenous B group vitamin (eg, Cernevit[22] complex) with or without intravenous thiamine (Pabrinex[23]).”

99. Dr French concluded that Ms A’s nutritional status, particularly with reference to micronutrients, was neglected, which led to serious consequences. He considers that this represents a moderate departure from the accepted standard of care.

100. I accept Dr French’s advice and agree that the assessment and management of Ms A’s nutritional status during her hospital admissions was inadequate. While Ms A’s vomiting abated over the course of the three hospital admissions, and on occasion she was able to tolerate puréed food, the improvements lasted only for short periods of time. For the most part, Ms A had persistent vomiting, which, as a post-bariatric patient, placed her at risk of micronutrient deficiency, particularly thiamine (B1).

101. Dr B was aware of the risks for a post-bariatric patient not taking multivitamins. Dr B was also aware of Ms A’s persistent nausea and vomiting, and that consequently Ms A was unable to take her multivitamins orally. Given Dr B’s knowledge of these issues, I am concerned that Dr B did not instigate an alternative mode of administration to ensure that Ms A received adequate multivitamins during her hospital admissions.

102. Although I note the lack of documentation, I accept that at each discharge, advice was provided to Ms A to commence taking multivitamins at home, and I accept that efforts were made to improve her oral intake. However, Ms A had repeated hospital stays during which she received no multivitamins. In my view, Dr B overlooked the nutritional assessment and requirements during Ms A’s hospital stays.

103. I accept Dr B’s submissions that Ms A was tolerating fluids, soft food, and tablets at each discharge, and that she was advised to take multivitamins. I also accept that Dr B was under the impression that Ms A had been following the advice she was given about taking her multivitamins, and that her micronutrient levels were replenished by daily multivitamin use (as well as soft food/fluid intake) during the periods when she was out of hospital. However, even if Ms A was in fact taking multivitamins at home, given the sheer number of days she was in hospital over the relevant period (more than 40 days from her hospital admission until the third balloon dilatation was performed and her symptoms finally resolved), I conclude that there was insufficient consideration of her vitamin supplementation. As commented on by Dr French, I do not accept that it was sufficient to rely on Ms A to attempt self-medication of multivitamins at home in between hospitalisations, nor was there sufficient consideration given to the likely impact of poor vitamin absorption given the ongoing vomiting that Ms A was experiencing.

104. Ms A was at home for only short periods of time, and I am of the view that she should have been provided with vitamin supplementation while she was in hospital. As noted by Dr

[22] A multivitamin supplement given as an injection or infusion.
[23] B vitamins including thiamine.

French, this should have been at least partially by intravenous (or intramuscular) administration. During Ms A's time in hospital, insufficient attention was paid to the effect of her vomiting on her ability to maintain an adequate intake of micronutrients.

105. Further, as Dr French advised, there was no input from a dietitian during Ms A's hospital admissions. Had a dietitian been involved, the risk of nutritional deficiencies may have been acted on earlier, and a plan could have been put in place to monitor Ms A's oral intake more closely, and assess whether it was adequate for her nutritional needs.

106. As multiple staff members and teams were involved in Ms A's care, I have considered whether any other individuals should be held to account. I conclude that because Dr B was the consultant responsible for overseeing Ms A's recovery following her surgery and during the subsequent hospital admissions, ultimately responsibility rests with Dr B.

Conclusion

107. I consider that as the responsible clinician during Ms A's hospital admissions, and in the context of Ms A's ongoing nausea and vomiting, Dr B failed to assess and manage Ms A's nutritional status adequately and provide her with the necessary multivitamin supplementation. Accordingly, I find that Dr B failed to provide services to Ms A with reasonable care and skill, in breach of Right 4(1) of the Code.

Documentation — adverse comment

108. At discharge, Dr B advised Ms A verbally to commence taking her multivitamins, but the advice was not documented in the clinical records.

109. The Medical Council of New Zealand's publication *Good Medical Practice* states that clear and accurate patient records must be kept that report the information given to patients, options discussed, and the proposed management plan. In previous reports, HDC has made numerous comments stressing the importance of good record-keeping and the accuracy of clinical records.[24]

110. Dr B was the specialist responsible for Ms A's care, and I am critical that Dr B did not ensure that the advice given to Ms A at discharge about taking multivitamins was documented. However, I appreciate that Dr B may have delegated the documentation of the reviews and the discharges, and that others also did not document the advice provided (discussed further below). Accordingly, I consider that this failure does not amount to a breach of the Code.

111. I suggest that Dr B consider how the record-keeping can be improved and, in future, add further detail in the clinical documentation.

Removal of appendix — no breach

112. Ms A raised concern about whether the removal of her appendix was necessary, as her symptoms were not relieved following its removal.

[24] For example: 19HDC01547, 12HDC00437, and 11HDC01103.

113. Dr French advised that it was clear that Ms A's presentation was not typical of appendicitis, but at that point, the gastric sleeve had been "exonerated", leaving the appendix as the remaining abnormality. He stated that a persistently abnormal appendix could also represent a small tumour, which eventually might need to be dealt with. Dr French concluded that the decision to remove the appendix was within acceptable practice. I accept this advice.

114. When the decision was made to remove Ms A's appendix, she was unwell and had symptoms of appendicitis, such as difficulty with her bowel, vomiting, nausea, and abdominal pain. The CT scan on 8 November 2018 also showed that the appendix's appearance was in keeping with acute appendicitis. While removal of the appendix did not resolve Ms A's symptoms, if appendicitis is left untreated, it can be life-threatening.

115. In the circumstances, I consider that it was reasonable for Dr B to err on the side of patient safety and to proceed with the removal of Ms A's appendix. I accept the advice that this was an appropriate clinical decision.

Other comment

Risks and benefits

116. Based on the information set out at paragraphs 29 and 30, I am satisfied that the risks and benefits of the gastric sleeve procedure, including the risk of nutritional deficiencies post procedure and the importance of vitamin supplementation, were explained to Ms A appropriately. I also note that my advisor, Dr French, considers that this aspect of the care met accepted practice, and I accept this.

Advice about multivitamins

117. Dr French was mildly concerned about the instructions given to Ms A about the timing of when to commence her postoperative multivitamin supplementation. He accepted, however, that there is no real consensus on how soon multivitamins should be started after gastric sleeve surgery, but advised that given that some water-soluble vitamins (including thiamine B1) have very little stores in the body and can become deficient within three to four weeks if intake is poor, earlier commencement of a multivitamin with adequate B1 content would be preferable.

118. I accept Dr French's advice and agree that patients should be instructed to commence taking multivitamins as soon as these can be tolerated after gastric sleeve surgery. However, as noted by Dr French, Ms A was taking multivitamins regularly prior to her surgery, and likely was replete in micronutrients at this time. I am therefore not critical of the advice provided to Ms A about when to commence her postoperative multivitamins.

119. I also acknowledge the changes Dr B has made, and that Dr B now advises patients to start taking their multivitamins while they are on the preoperative diet, and to re-start in the postoperative period when they are feeling confident about their oral intake. Dr B said that multivitamin intake is now discussed with patients three weeks after surgery, and, if they have not started their multivitamins, the importance of doing so is re-iterated.

Opinion: DHB — adverse comment

Assessment and management of nutritional status

120. During each of her hospital admissions, Ms A was admitted to the General Surgery ward under Dr B's care. Multiple staff members were involved in Ms A's care, and she was also reviewed by other specialties, including general medicine and gastroenterology.

121. As discussed above, it was more than 40 days from when Ms A was first admitted to hospital, until her symptoms finally resolved following the third balloon dilatation. During the majority of this time, she was troubled by nausea and vomiting, and had very limited nutritional intake. No multivitamin supplementation was provided to Ms A by any of the treating doctors over this period of time while she was in hospital.

122. While Ms A's vomiting did lessen, and on occasion she was able to tolerate puréed food, the improvements lasted only for short periods of time. As noted by Dr French, during the periods of improvement, there was little evidence of sustained intake of nutritional value, and no multivitamin intake. He advised:

> "I don't believe it is good enough to rely on the patient to attempt self-medication of vitamins at home during short periods between hospitalisations, instead attempts to provide vitamin supplementation should have occurred in hospital. This should have been at least partially by the intravenous (or intramuscular) route."

123. Dr French advised that Ms A's nutritional status (particularly with reference to micronutrients) was neglected by the treating doctors, which he believes represents a moderate departure from the accepted standard of care.

124. I accept Dr French's advice. I am concerned that multiple staff members failed to identify Ms A's need for nutritional support and multivitamins. I would have expected the medical staff to have been aware of the importance of providing patients who have had bariatric surgery with multivitamin treatment postoperatively. The DHB's guidelines on "Eating after Bariatric Surgery" also state that multivitamins should be started in the first three weeks after surgery, and that two multivitamins per day should be taken for the first year after surgery. The importance of multivitamins for Ms A, and the risk of nutritional deficiency, were not recognised sufficiently, particularly in light of her ongoing vomiting.

125. The need for Ms A to be taking multivitamins should have been identified and acted upon. At no stage during any of Ms A's hospital admissions was there any discussion about the need for Ms A to be provided with alternative forms of nutrition or multivitamins while her condition was being assessed and investigated. There was also no assessment of her nutritional status in light of her inability to tolerate anything orally. In my view, this indicates a lack of understanding and knowledge about nutritional requirements among multiple staff members.

126. I have recommended that Te Whatu Ora provide training to all clinical staff who were involved in Ms A's care, on the importance of assessing a patient's nutritional status, so that

they are fully aware of the risk of micronutrient deficiency among patients who have had bariatric surgery.

Assessment and management of symptoms

127. Ms A's first endoscopy and balloon dilatation was performed on 23 November 2018, which was nine days after her second hospital admission on 14 November 2018.

128. Dr French advised that there was "quite a bit of delay" before the first endoscopy and balloon dilatation was performed. He said that given the potential risks of an endoscopy following gastric sleeve surgery, some degree of caution was reasonable. However, he considers that the need to resolve Ms A's symptoms "probably outweighed" the risks of an endoscopy. He concluded that the assessment and management of Ms A's symptoms represents a mild departure from the accepted standard of care.

129. I accept Dr French's advice. While I acknowledge that performing an endoscopy and balloon dilatation within the first four weeks following gastric sleeve surgery could risk rupturing the newly formed staple line,[25] the four-week waiting period had already lapsed by 12 November 2018. Therefore, the first balloon dilatation could have been performed earlier.

130. However, as noted by Dr French, the delay was mitigated by the prompt response when Ms A was re-admitted to hospital on 11 December 2018. During this hospital admission, a second endoscopy and balloon dilatation was performed on 13 December 2018, and a third endoscopy and balloon dilatation was performed on 19 December 2018, which finally resolved Ms A's symptoms.

Documentation

131. At each discharge, Ms A was advised verbally to commence taking her multivitamins, but this advice was not documented in the clinical records.

132. I am critical that several staff members failed to document the advice that was given to Ms A at discharge about taking multivitamins. Given the importance, I would have expected this advice to have been documented in detail in the clinical notes.

133. The Medical Council of New Zealand's publication *Good Medical Practice* states that clear and accurate patient records must be kept that report the information given to patients, the options discussed, and the proposed management plan. Several staff members did not meet the standards outlined by the Medical Council, as they did not document the advice given to Ms A at discharge about taking multivitamins.

134. I am also concerned that the importance of this advice may not have been communicated to Ms A clearly. Ms A's text message to Dr B on 8 December 2018 asking when to start taking her multivitamins suggests that Ms A was unclear about the advice, and that the advice was not communicated in such a way that enabled Ms A to understand it. However, as there is no record, I am unable to determine exactly what advice was provided.

[25] Staples are used in surgery to close skin wounds or connect or remove tissues inside the body.

135. In previous reports, HDC has made numerous comments stressing the importance of good record-keeping and the accuracy of clinical records.[26]

136. It is the responsibility of Te Whatu Ora to provide oversight of its staff in relation to the standard of clinical documentation. I have recommended that Te Whatu Ora review the quality of its clinical documentation to ensure that staff record the advice given to patients at discharge accurately.

Changes made since events

Dr B

137. Dr B told HDC that these events had a significant effect on the subsequent management of patients following gastric sleeve surgery. Dr B said that a three-week course of thiamine is now included in the discharge medication pack for all patients to prevent thiamine deficiency, particularly during the early postoperative period.

138. Dr B stated that patients are also now advised to start taking their multivitamins while they are on the preoperative diet, and to re-start in the postoperative period when they are feeling confident about their oral intake. Dr B said that multivitamin intake is also discussed with patients three weeks after surgery, and, if they have not started their multivitamins, the importance of doing so is re-iterated.

139. Dr B told HDC that advice from a dietitian is now much more likely to be sought for any patient who has had disrupted oral intake for more than five days. Dr B also now gives all bariatric patients who are admitted to hospital a single intra-muscular dose of multivitamins as a preventative step for vitamin malnutrition.

140. Dr B stated that these events have changed the way in which vomiting is managed following gastric sleeve surgery and, essentially, Dr B aims to expedite dilatation as a definitive treatment. Dr B said that if resolution of oral intake is not successful, then early consideration of intravenous multivitamin preparation is essential.

Te Whatu Ora

141. Te Whatu Ora said that while the DHB was not involved in performing Ms A's surgery, Te Whatu Ora's protocol will be discussed and reviewed in accordance with its usual review processes, to ensure that they are in keeping with best practice.

[26] For example: 19HDC01547, 12HDC00437, and 11HDC01103.

Recommendations

142. Dr French advised that the changes that have been made by Dr B since the events are "spot on" and will prevent any similar problems in the future. Taking into account the changes made by Dr B since the time of events, I recommend that Dr B:

a) Provide a formal written apology to Ms A. The apology should be sent to HDC, for forwarding to Ms A, within three weeks of the date of this report.

b) Continue to adopt the changes made in providing patients who have had bariatric surgery with a three-week course of thiamine, advising patients to start taking multivitamins as soon as they are able to tolerate these after surgery, seeking the advice of a dietitian for patients who have had disrupted oral intake for more than five days, and giving patients who are admitted to hospital an intra-muscular dose of multivitamins. Dr B is to provide HDC with evidence of having done so over a three-month period from the date of this report.

143. I recommend that Te Whatu Ora:

a) Provide a formal written apology to Ms A for the deficiencies in the care provided, as outlined in this report. The apology should be sent to HDC, for forwarding to Ms A, within three weeks of the date of this report.

b) Provide training to all clinical staff who were involved in Ms A's care and who are currently still employed by Te Whatu Ora, on the importance of assessing a patient's nutritional status, so that they are fully aware of the risk of micronutrient deficiency among patients who have had bariatric surgery. Evidence of this is to be provided to HDC within six months of the date of this report.

c) Review the quality of the clinical documentation of its bariatric service to ensure that its staff record the advice given to patients at discharge accurately. Evidence of this is to be provided to HDC within six months of the date of this report.

d) Use this report as a basis for staff learning at Te Whatu Ora, and provide HDC with evidence that this has been completed, within six months of the date of this report.

Follow-up actions

144. A copy of this report with details identifying the parties removed, except the expert who advised on this case, will be sent to the Medical Council of New Zealand and the Royal Australasian College of Surgeons, and they will be advised of Dr B's name.

145. A copy of this report with details identifying the parties removed, except the expert who advised on this case, will be sent to the Health Quality & Safety Commission and placed on the Health and Disability Commissioner website, www.hdc.org.nz, for educational purposes.

Appendix A: Independent clinical advice to Commissioner

The following expert advice was obtained from Dr Rowan French, a consultant general surgeon with an interest in bariatric and metabolic surgery:

"**Independent surgical advice to the Commissioner — Mr Rowan French**

C19HDC01764

Thank you for asking me to provide advice to the Commissioner regarding the care of [Ms A] provided by [Dr B] between August 2018 and January 2019. I declare no conflicts of interest related to this case. I have read and agree to follow the HDC's Guidelines for Independent Advisors.

My qualifications are MBCHB 1996, FRACS 2004. I am a consultant General Surgeon with an interest in Bariatric and Metabolic Surgery. I am currently Clinical Unit Leader of Surgery and Subspecialties at Waikato District Health Board. I previously set up and currently run the Bariatric Programme at Waikato DHB for the midland region, and have been performing bariatric surgery in public and private sectors for 12 years. I am a member of the Court of Examiners for the Royal Australasian College of Surgeons. I am current President of the New Zealand Association of General Surgeons.

I have been requested to address the following questions:

1. Was assessment and management of [Ms A's] nutritional status by [Dr B] consistent with accepted practice, both prior to the bariatric surgical procedure, and during [Ms A's] subsequent hospital admissions?
2. Was the assessment and management of [Ms A's] gastrointestinal symptoms during her hospital admissions 14 November–6 December 2018 and 11 December–28 December 2018 including the decision to perform appendicectomy, consistent with accepted practice?
3. Was there timely diagnosis of [Ms A's] polyneuropathy, thought to be related to nutritional deficiency? If the diagnosis was delayed, was this the result of any identifiable deficiency in her care at the public hospital?
4. Do you have any additional comments to make on the issues raised in the complaint or the provider responses?

I have reviewed the following information in order to provide this opinion

— Letter of complaint from [Ms A] dated 12 September 2019
— [The private hospital's] response dated 24 October 2019, including clinical notes
— [The DHB's] response dated 20 December 2019
— Responses from [Dr B] Dated 24 February 2020 and 28 May 2020
— Clinical records from [the DHB] covering the relevant period
— Notes from nutritionist [Ms C] dated 17 January 2019
— … Surgery Nutritional guide

— Source images from contrast swallows dated 6/11/18, 4/12/18 and 17/12/18

Summary of events

On the 14 December 2017 [Ms A] first consulted with [Dr B] regarding bariatric surgery. A surgery information pack including nutrition booklet was sent out to [Ms A] along with request forms for initial blood tests. These tests included full blood count, urea/ electrolytes, thyroid function, C-reactive protein, vitamin D, lipid profile, ferritin, Hba1c, albumin, calcium, vitamin B12 and folate. These were all within normal limits. On 22.01.2018 [Ms A] consulted with nutritionist [Ms C] as part of her further workup for surgery. As part of this consultation [Ms A's] current diet and exercise patterns were reviewed, and a number of recommendations were made. These included a recommendation to start a multivitamin … and extra calcium at 3 weeks postoperatively, and to use a 'greens powder … or fresh greens added to a smoothie everyday' to provide more vitamins, minerals and phytonutrients. The letter from the nutritionist notes that discussions included '… how to approach eating to reduce the risk of nutrient deficiencies and maintain weight long term.'

[Ms A] decided to delay surgery, but did have a further consultation with the nutritionist (a 'refresher' I would imagine) closer to the date of her surgery on 14.09.2018. The panel of blood tests were repeated at that point and were again normal, apart from a slightly elevated C-reactive protein which is likely of no concern.

On the 15 October 2018 [Ms A] was admitted to [the private hospital] for the Sleeve Gastrectomy procedure. A prior note from the preadmission nurse records that [Ms A] seemed to have a good understanding of the preparation for her admission. Her Body Mass Index (BMI) was noted to be 57. The recovery from surgery seemed largely unremarkable while in [the private hospital].

Approximately 2 weeks following the surgery [Ms A] awoke with nausea and vomiting. Up until that point she had apparently been tolerating a puréed diet reasonably well. She was admitted to the public hospital on 02.11.2018, at that point of time her weight was 133.7kg. A Computed Tomography (CT) scan showed no obvious complication from the sleeve, in particular no leakage was noted. An apparently incidental finding was noted of her appendix being thickened to 13mm, with some 'trivial' fat stranding around it. [Ms A] had not complained of right iliac fossa abdominal pain, but was noted to have tenderness on deep palpation over the appendix. The note from the registrar reads '… presentation highly atypical for appendicitis …'. The C-reactive protein was slightly raised at 26. Antibiotics were prescribed, presumably to treat any existing appendicitis.

On the 06.11.2018 [Ms A] underwent a water soluble contrast swallow. The provisional report written in the notes suggests 'typical post sleeve mid gastric (very tight) twist'. The formal report by the radiologist amends the impression to 'I initially thought this was post surgical gastric stenosis but reviewed with the surgical SMO I think this looks like some angulation of the pylorus with a rather unusually long duodenal cap …' The impression on [Dr B's] ward round on 07.11.2018 was 1. Appendicitis and 2. Typical post

sleeve twist. It seems the former of these two diagnoses was preferred as antibiotics were continued to treat the appendicitis medically.

By 08.11.2018 the symptoms had not settled. It appears from the notes that [Ms A] had significant nausea/vomiting and minimal oral intake since admission 6 days before. The ongoing impression seemed to be a diagnosis of appendicitis. A repeat CT scan showed similar changes of possible appendicitis (appendiceal thickening) but no evidence of phlegmon or collection. The result was discussed with [Dr B] and a plan made to proceed to appendicectomy. At surgery that same day there was noted 'unusual appearance of appendix tip — dilated, no perf'. [Ms A] had further vomiting in the evening after surgery. There was one episode of vomiting on 09.11.2018 after 'a bite of food'. On the 10.11.18 [Ms A's] nausea was improved, and she was discharged from hospital. A plan was made for follow up with [Dr B] in [Dr B's] private clinic the following week.

On 14.11.2018 [Ms A] was readmitted with further vomiting despite regular antiemetics. Two vomits were witnessed in the Emergency Department. Slightly deranged liver function tests were noted and a biliary ultrasound was requested the next day, this showed gallbladder sludge only. On 16.11.2018 a 500ml vomit was noted with ongoing nausea. The registrar note suggests reluctance to consider upper endoscopy because of risks with the recent sleeve. A gastroenterology review on this day occurred, but there were no particular suggestions for management. A General Medical review occurred on 17.08.2018 with a suggestion to reconsider the diagnosis of pancreatitis.

On the 21.11.2018 a further gastroenterology consult occurred, and a plan was made to perform upper GI endoscopy. The notes suggest ongoing nausea and vomiting since admission with little oral nutritional intake. There are vomits recorded on the 16th, 17th, 18th, 19th and 20th prior to the gastro consult. The nursing notes suggest [Ms A] was able to hold down some soup on the 22nd and the 23rd, but vomits are also recorded on both these days.

On 23.11.2018 an Upper GI endoscopy was performed. This showed oesophagitis and a mild stenosis in the mid-sleeve. A balloon dilatation was performed. The comments indicate a classic twist seen in mid gastric body related to sleeve, but the scope could traverse easily. Over the following few days there appeared to be improvement with minimal vomiting, and [Ms A] appeared to tolerate a soft diet at times. I note the meeting on the 28.11.2018 between the Clinical Nurse Manager, [Ms A] and [her father] regarding their concerns about the appendicectomy.

On 29.11.2018 things seem to deteriorate again, with reports of vomiting on this day and over the next few days (29th, 30th, 1st and 3rd). On the 04.12.2018 a further contrast swallow was performed. The report indicated a 'twist is shown in the mid body causing some proximal holdup but ultimately this does open and probably up to 10 or 12mm in diameter …' Notes from the [Dr B] ward round that day indicated 'no stenosis, tolerating

>1L fluid, keen to go home'. [Ms A] was discharged on 06.12.2018. It was planned for her to follow up with [Dr B] in private.

On the 08.12.18 there is a text message from [Ms A] to [Dr B] 'when can I start taking my multivitamins?', to which [Dr B] replied 'now would be good'.

On 11.12.18 [Ms A] was readmitted to [the public hospital] with recurrent nausea and vomiting. She was given intravenous fluids, omeprazole and antiemetics and referred for Upper GI endoscopy. On 13.12.18 she was noted to be 'unable to keep food down'. [Dr B's] ward round stated 'for ogd today' (upper GI endoscopy). Two further vomits were noted. The endoscopy reported 'no severe stenosis seen. Usual narrowed angularis. Dilated to 35mm …' Unfortunately this procedure didn't improve [Ms A's] symptoms much, with further vomiting noted on the 15th, 16th and 17th. On each of these days the fluid prescribed was dextrose saline.

A third contrast swallow study was performed on 17.12.18. The formal report suggests a 'moderate relative narrowing in the mid gastric body, however this did not appear to cause significant pooling of contrast proximally'. A decision was made on the 18.12.18 to trial a gastric stent, and this decision appears to be confirmed on [Dr B's] ward round on 19.12.18. Repeat endoscopy went ahead on 19.12.18, and a moderate stenosis was dilated with a 35mm balloon. The report states 'does not look like the stenotic area has been dilated effectively as no signs of disruption and patient didn't have even temporary relief'. A potassium tablet was noted proximal to the stenosis. A suggestion was made to stop potassium tablets and commence effervescent potassium instead.

From the 20.12.18 to the 25.12.18 it appears that [Ms A] made a gradual improvement after the third endoscopy. Although difficult to ascertain it seems likely her nutritional intake improved over this time. She had home leave on the 25.12.18 but returned for review on 27.12.18 because she was 'uncertain about any improvement in her symptoms'. By this time [Ms A] had begun complaining of bilateral thigh numbness. Power exam was normal. On review by the ward physio she was noted to be 'safe and steady ?functional overlay to her presentation.' Food intake appears better during this admission but there was nausea. On the 28.12.18 she was discharged with the instructions '[Ms A] to organize follow up with [Dr B] in private'.

On 29.12.19 [Dr B] sent a text message to [Ms A] 'Hi [Ms A], can you give me a ring when you can?'. Her intention as stated was to discuss oral intake and confirm multivitamin use. The text message was not answered.

On 22.01.2019 [Ms A] was admitted to hospital under the medicine service with neurological symptoms and neuropathic pain. Her ability to walk was compromised and she had developed foot drop. Red cell thiamine was 82 at one point (normal >140). Subsequent CT head showed no intracranial abnormality. Eventually nerve conduction studies are done on the 30.01.2019, and on 01.02.2019 a formal diagnosis of polyneuropathy due to vitamin deficiency was made. On 07.02.19 [Ms A] was admitted to rehabilitation to help with her neurological recovery.

1. **Was assessment and management of [Ms A's] nutritional status by [Dr B] consistent with accepted practice, both prior to the bariatric surgical procedure, and during [Ms A's] subsequent hospital admissions?**

[Ms A] had what I would view as a fairly standard preoperative workup for bariatric surgery. The indication for surgery was appropriate. She had an assessment by an experienced bariatric nutritionist which is consistent with the standard of care. The range of blood tests performed was comprehensive and consistent with the standard of care. I note that both the nutritional consultation and the blood tests were repeated after [Ms A] delayed her surgery which is commendable. Some practices might also add Zinc and Parathyroid Hormone (PTH) but I would not see these as mandatory in the case of [Ms A].

I hold some mild concern about the instructions given to [Ms A] with regards the timing of when to commence her postoperative multivitamin. The … Nutritional Guide recommends that supplements be started 3 weeks postoperatively and this was the advice given to [Ms A]. I accept that there is no real consensus on how soon multivitamins should be started after a Gastric Sleeve. However given some water soluble vitamins (including thiamine B1) have very little stores in the body and can become deficient within 3–4 weeks if intake is poor, I think it is advisable to consider commencing these earlier, say at 1 week. I do note from the Nutritionist letter however that [Ms A] was taking a multivitamin preoperatively which perhaps somewhat mitigates the delay. I note [Dr B] now plans to commence thiamine supplementation early postoperatively which is sensible, but earlier commencement of a multivitamin with adequate B1 content would perhaps be preferable.

In summary, with regards to the management of [Ms A's] nutritional status prior to surgery, the assessment and management was of an appropriate standard.

I turn my attention now to the assessment and management of [Ms A's] nutritional status during the subsequent hospital admissions. This is perhaps the area of most concern. [Ms A's] case reveals quite striking similarities with a previous HDC case (09HDC01932)[2] to which I have referred during the writing of this report. Bariatric surgery, by its very nature of greatly restricting the ability to eat, carries risk of deficiencies in both macronutrients and micronutrients. Water soluble vitamins in general are more difficult for the body to store, and can easily become deficient when intake is curtailed. The gastric sleeve is perhaps considered to have a lower long term risk of vitamin deficiency compared to other procedures such as the gastric bypass or duodenal switch because it is not associated with small bowel diversion. When the main clinical problem is vomiting however, it probably carries a similar risk of B group vitamin deficiencies as the other procedures. B group vitamin deficiencies can carry a number of consequences, but probably the most important to recognize and treat is thiamine (B1) deficiency, because it can cause irreversible neurological sequelae in the form of Wernicke's encephalopathy and other neurological impairments. It seems very likely, although impossible to prove beyond doubt, that [Ms A's] neurological symptoms were due to thiamine deficiency (although other vitamin deficiencies may have played a part).

Thiamine plays an important role in carbohydrate metabolism. The importance of early recognition and treatment of thiamine deficiency has long been recognized in alcoholics and is usually prescribed for such patients during hospital admissions. In recent years there has been similar recognition of the possibility and importance of thiamine deficiency in bariatric surgery patients, particularly those with poor early food tolerance and recurrent vomiting. An otherwise well patient with little or no thiamine intake will usually become deficient within approximately 30 days (although there is likely some variability), with a range from 2 weeks to 3 months[3]. It is therefore not surprising that [Ms A] developed deficiency. The typical symptoms of Wernicke's encephalopathy include the triad of opthalmoplegia (weakened eye muscles) with nystagmus, motor ataxia and confusion, although it is said only 16% have all three[4]. [Ms A's] main symptom appeared to be motor ataxia (weakened and discoordinated leg muscles), with some sensory changes. A systematic review in 2007 confirmed that the highest risk of deficiencies is in young women with vomiting after bariatric surgery, and highlighted that symptoms are often atypical[5].

There was a total of 47 days between [Ms A's] first admission on 2.11.18 and the 3rd endoscopy procedure on 19.12.18 when her symptoms were finally resolved. During the majority of this time (but not all) [Ms A] was troubled by nausea, vomiting and very limited nutritional intake. No multivitamin supplementation was provided by the treating doctors over this period of time while she was in hospital. Looking through the timeline I created from the notes, there appears to be only two short periods in this 47 day period when [Ms A] was not so troubled by nausea and vomiting. These are a period of 3–4 days between 10.11.18 and 14.11.18 (just prior to the second admission), and potentially 8–9 days when there was intermittent improvement after the first dilatation. Even during these periods of relative symptom abatement, there is little evidence of sustained intake of nutritional value, and seemingly no multivitamin intake. These periods of improvement appeared to lull the team into a false sense of security, even though the periods probably did little to prevent the developing vitamin deficiency.

In my view [Ms A] should have been prescribed multivitamin supplementation, probably during the first admission and definitely during the second and third admissions. Failure to do so unfortunately represents a serious deficiency in her care. Oral supplements could have been trialled, but a better option would likely be an intravenous B group vitamin (eg Cernevit complex) with or without intravenous thiamine (Pabrinex). Although macronutrients are generally of less concern, another option would be polymeric nasojejunal feeding via tube (although one would wish to keep in mind the original aim of careful sustained weight loss of course). In addition, [Ms A] had fairly liberal prescription of dextrose saline as maintenance fluid during long periods of vomiting — normally entirely appropriate, but in someone with developing thiamine deficiency giving glucose without thiamine replacement can hasten neurological problems. It is however the junior staff who prescribe the fluids usually, and it would be drawing a long bow to expect them to connect the dots on this issue. On one level I can understand how preoccupation with finding the cause of symptoms

perhaps dominated the team's and [Dr B's] thinking during this time, however provision of adequate micronutrient support falls into the 'too important to forget' category. The consequences for [Ms A] have been severe.

I note in the responses from [Dr B] and [the DHB], that the treating doctors felt [Ms A] improved substantially on several occasions. In reality the periods of improvement were fairly short and the improvement patchy. There seems to have been a reliance on her commencing her multivitamin supplement on discharge. It is stated, but not documented, that she was reminded at each discharge to commence her multivitamin. Unfortunately this communication doesn't appear to have been effective, given the text message by [Ms A] to [Dr B] 2 days after the second discharge asking 'when can I start taking my multivitamins?'. Given each discharge was only for a short number of days, relying on the patient's self-medication of multivitamins at home to mitigate vitamin deficiency was unlikely to succeed.

I note there was no request for dietician involvement in [Ms A's] care during her admission. There may be a number of reasons for this. Perhaps the most common is that private Bariatric surgeons usually have their preferred dietician/nutritionists, and sometimes the aims of a hospital dietician may be different to those of a dietician/ nutritionist with expertise in controlled weight loss. In [Ms A's] case however I believe there would have been value in the involvement of a hospital dietician during her admissions. They have expertise in micronutrient management and, given their likely focus solely on the patient's nutrition, I believe it is highly likely that the risk of deficiencies may have been drawn to the attention of the doctors far earlier. I note this particular hospital has substantial experience in bariatric surgery and it is likely that the hospital dieticians do as well, so I remain uncertain why they were not involved in [Ms A's] case.

I believe that [Ms A's] treating doctors became preoccupied with finding the cause of her symptoms, but her nutritional status (particularly with reference to micronutrients) was neglected which unfortunately led to serious consequences for her. I believe this represents a moderate departure from expected standard of care, and would be viewed with a moderate degree of disapproval by my peers in the field of bariatric surgery.

2. **Was assessment and management of [Ms A's] gastrointestinal symptoms during her hospital admissions 14 November–6 December 2018 and 11 December–28 December 2018, including the decision to perform appendicectomy, consistent with accepted practice?**

The discussion now turns to the assessment of [Ms A's] symptoms. I am going to include the admission from 2 November 2018–10 November 2018 because the appendicectomy was performed during this admission. The initial presentation was essentially of a patient, 2 weeks after a gastric sleeve who developed quite sudden nausea and vomiting, after initially having reasonable tolerance of at least a puréed diet. The initial presentation was not suggestive of an inflammatory/sepsis problem, with minimal abdominal pain and mostly normal inflammatory markers. An early CT

scan was performed the next day which is entirely appropriate, it helped rule out problems such as staple line leak or collection. The CT scan did reveal some thickening of the appendix (to 13mm) but with few other radiologic signs of appendicitis (apart from 'trivial' fat stranding). There appears to have been some (I would say healthy) scepticism about the diagnosis of appendicitis, but it was felt that treating with intravenous antibiotics was reasonable. This was a strategy to try and avoid appendicectomy initially by treating any existing appendicitis medically. This is a reasonable initial strategy in my view and I think would be supported by my peers.

Given that nausea and vomiting were the main symptoms, the team quite reasonably went on to seek other causes. To this end [Ms A] underwent a water soluble contrast study on 6.11.2018. The initial provisional report in the handwritten notes from the radiologist states 'typical post sleeve mid gastric (very tight) twist. Otherwise as expected'. I understand there was subsequent discussion between [Dr D] (reporting radiologist) and [Dr B] about the swallow. The formal report reflects this discussion, and the area of narrowing was subsequently reported as being an angulated pylorus. Subsequent to this over the next couple of days the treating team seemed to be reassured by the contrast swallow results and attention turned to the appendix as a possible explanation for symptoms.

Given the differences between the provisional and final radiology reports on this contrast swallow, I have viewed the films myself. It is important to note that the films are likely only a subset of those taken, it is a dynamic study and a large part of the interpretation is done by the person performing the study at the time. I would agree with the formal report that the area of luminal narrowing near the lowermost surgical clips is likely the pylorus as described. However I believe this has detracted attention from where the real problem lies, higher in the mid-stomach. I believe there are some signs of gastric twisting on this first swallow test, although it can be subtle. This is likely easier for me in retrospect, given the mid-gastric twist is subsequently proven on later swallow tests. Gastric sleeves can be prone in some cases to twisting in the postoperative period in a manner depicted by model in fig. 1[1]. It occurs when the residual antrum distal to the angularis folds over towards the right. This can create a functional obstruction, when the 'top half' of the sleeve fills with content and distends, causing nausea, retching and vomiting. I don't believe there is any clear consensus on how to prevent it, but some surgeons employ techniques such as reattaching the omentum, or using fibrin glue which may help. I would not consider it due to a technical deficiency during the procedure, and it is probable that most surgeons doing this procedure have had cases from time to time (recognized or not).

Perhaps my main concern regarding this initial swallow test is the comment made in [Ms A's] complaint letter (page 2) where she comments

'November 7th — [Dr B] told me there was no twist or anything wrong with my sleeve. [Dr B] then told the Radiologist [Dr D] off for showing me my results and told [Dr D] off and to change the report as was wrong'.

I don't have any record of the nature of conversations between [Dr D] and [Dr B] regarding this test result, apart from the brief mention by [Dr D] in the radiology report that he 'reviewed with the surgical SMO'. In the reply from [the DHB] by [the] (CMO) there is stated reassurance from [Dr B] that the conversation was collegial and there was no 'telling off'. I am uncertain of the grounds on which [Ms A] suggests that [Dr B] 'told off' [Dr D]. **It is often helpful for a radiologist and a treating clinician to view radiology films together to help with interpretation, and if this occurred in a congenial, two way fashion then this would be good practice. If however, there was coercion by [Dr B] for [Dr D] to alter what may have been a correct provisional report (as suggested by [Ms A]) then this would be viewed with some disapproval.**

A repeat CT scan on the 8.11.2018 showed ongoing thickening of the appendix (but no progression) and [Dr B] recommended appendicectomy which occurred that evening. It is clear that the presentation was not at all typical for appendicitis. However if, in the team's mind the sleeve had been exonerated, then the abnormal appendix was the one remaining abnormality. The other thing to consider is that a persistently abnormal appendix on CT could represent a small tumour such as a carcinoid, so may eventually need dealing with anyway. **As such I think the decision to remove the appendix was within acceptable practice.** My concern about the appendicectomy is more in relation to the communication with [Ms A] about the procedure, than the decision to proceed per se. It should have been clear to the treating doctors that there was a fair chance that removing the appendix might not fix the presenting problem (nausea and inability to hold food down). This uncertainty about how the appendicectomy may help (or otherwise) [Ms A's] symptoms should have been communicated in the discussions and consent process, and I'm not convinced that it was based on the notes and [Ms A's] account.

It is probable that there was little improvement in [Ms A's] condition after the appendicectomy and she was readmitted with the same symptoms on 14.11.2018. There is early consideration given to an upper gastrointestinal endoscopy, but there seemed to be reluctance to proceed, perhaps based on the potential risks of an endoscopy in the setting of recent surgery (staple line disruption etc). I would consider some degree of caution reasonable here, but the need to sort out the symptoms probably outweighed the risks of endoscopy at this stage in my view. At this point [Ms A] was 4 weeks postoperative. There is quite a bit of delay before endoscopy was performed on the 23.11.2018 (9 days). During this time there were reviews by a Gastroenterology registrar and the medical teams. While it was reasonable to request these consultations, they turned out to be not particularly helpful. In my view there was a little too much reliance on the first swallow test (which may have been incorrectly interpreted, and perhaps should have been reviewed with colleagues at this time), and a little too much time looking for other causes. In probability terms, when a patient presents with nausea and poor food tolerance/vomiting after a restrictive bariatric procedure, in most cases the problem will lie with either the procedure itself or poor eating habits.

Endoscopy was performed on the 23.11.2018, a twist was noted and a dilatation performed. It seems that [Ms A] improved substantially for a time after this procedure, but on approximately the 29.11.2018 the vomiting appears to have returned for a while, although by the 04.12.2018 the notes indicate [Ms A] as feeling 'normal now'. Another contrast study is done on this day, and is provisionally reported as showing an angle in the mid-body of stomach, offering some restriction and hold up and inducing retching. The formal report confirms a twist in the mid-body, but this ultimately opens to let barium through. In my review of the films, the pictures look very similar to those in the first contrast swallow nearly a month before. Unfortunately it seems the treating doctors were again reassured by this, and [Ms A's] ability to tolerate at least 1L of fluid, and she was discharged on the 05.12.2018. In retrospect it seems her symptoms weren't resolved, and she was readmitted on the 11.12.2018.

During this readmission that occurred on the 11.12.2018, the treating doctors moved quite quickly to a further endoscopy which I would support as the correct course of action[6]. The report says 'no severe stenosis seen. Usual narrowed angularis' and dilatation was performed. It is not surprising that there was no severe stenosis seen, as during endoscopy the sleeve tends to 'untwist' (see fig 1). The obstruction caused by a twist is a dynamic occurrence with the distal half of the sleeve folding over rather than a fixed constant fibrotic narrowing. The lack of improvement after the procedure this time would perhaps have been perplexing for the treating doctors, and they quite reasonably repeated the contrast swallow on the 17.12.2018. On the basis of this test, a repeat endoscopy was promptly performed on 19.12.2018 by Dr … who I understand is highly experienced in endoscopic management of bariatric surgery complications. A more complete dilatation was performed. It seems from my reading of the notes that [Ms A] 'turned the corner' at this stage and her food tolerance and nausea slowly improved without further significant recurrence.

Fig.1

Overall I do have some concern about the assessment and management during the first two admissions (02.11.2018–10.11.2018 and 14.11.2018–06.12.2018). While I feel the appendicectomy was ultimately reasonable, there may have been an unwarranted alteration of [Dr D's] provisional report on the first swallow. There seemed to have been an overly optimistic expectation that appendicectomy would solve the problem. There seemed to have been an over-reliance on the initial formal swallow report leading to delays in getting the first endoscopy and dilatation done on the 23.11.2018. The reply on behalf of [the DHB] from [the] (CMO) strongly implies that [Ms A's] doctors believed early on that there was a sleeve twist but 'we were unable to do immediate endoscopic procedures due to the risk of rupturing your gastric sleeve suture line …'. The conclusion drawn from reading the medical records doesn't really back this up, and the requested consultations from medicine and gastroenterology suggests there was still a search for alternative diagnoses going on. The suggested waiting time for safe endoscopy in [the CMO's] reply (4 weeks) had also elapsed at the very beginning of the second admission (14.11.18), and there are references in the notes to a 'normal swallow study' which makes me suspect the treating doctors did not really believe there was a twist. These shortfalls were mitigated somewhat in my mind by a fairly prompt and rational response to readmission on the 11.12.2018 which ultimately resulted in the therapeutic endoscopy on the 19.12.2018. Other mitigating factors include the fact that causes of vomiting after bariatric surgery can be varied, and in some cases are 'functional' (in simple terms some patients take a long time to get used to eating small and slowly).

My view is that more thorough attention to the first and second swallow tests may have expedited earlier resolution. Review of these films with another experienced bariatric colleague may have been useful**. There are some mitigating factors, but in summary I believe the assessment/management of [Ms A's] symptoms represents a mild departure from standard of care. It would be viewed with mild disapproval by my peers in this field.**

3. Was there timely diagnosis of [Ms A's] polyneuropathy, thought to be related to nutritional deficiency? If the diagnosis was delayed, was this the result of any identifiable deficiency in her care at [the public hospital]?

The first documentation I have been able to find regarding [Ms A's] neurological symptoms was when she returned for ward review by a surgical registrar on 27.12.2018. The notes comment on 'Bilateral thigh numbness feeling', but lower limb power seemed to be normal on examination. A physiotherapy review occurred later in the day on request of the registrar. Given the non-specificity of the symptoms this was a reasonable initial approach to the symptoms described. I imagine the registrar may have been thinking of pathology in the lumbar spine, given a comment in their note 'mild tenderness lower lumbar area'. The physio described 'very extreme wobbles' (which is perhaps a strange description) but felt [Ms A] was safe and steady, and was happy to discharge her from physio care. There is no indication that the physio had close knowledge of all that had gone on before, so I feel their assessment was reasonable. [Ms A] remained in hospital it seems and was reviewed by another registrar the next day. There is no further documentation of neurological symptoms at this point — this

may have been because at this stage symptoms were relatively mild or perhaps intermittent.

[Ms A] was readmitted under medicine with far more pronounced neurological symptoms on 22.01.2019. The symptoms appeared to be predominantly in the lower limbs with neuropathic pain, an element of foot drop and difficulty walking. The investigations instigated by the medical team seem quite reasonable — an initial CT scan of the head and a review by neurology shortly after. The first neurology review by Dr … is clearly the subject of substantial distress for [Ms A]. I have not been asked to specifically comment on this, and it would be difficult to do so without any alternative viewpoint. If [Ms A's] account of the consultation is correct then it would be somewhat disturbing. [Ms A] went on to have nerve conduction studies a few days later and review by another neurologist. At this stage a diagnosis of acute peripheral neuropathy, 'likely nutritional' was made.

Given the gap between the initial (non-specific) presentation on 27.12.2018 and the more profound presentation on 22.01.2019, and given the rarity of polyneuropathy secondary to vitamin deficiency (most likely thiamine B1), my view is that the diagnosis of the 'polyneuropathy secondary to vitamin deficiency' was reasonably timely and the process followed an acceptable standard. I reserve comment on the conduct of the first neurology consultation, this is something the commissioner may wish to look in to.

4. Do you have any additional comments to make on the issues raised in the complaint or the provider responses?

I would like to acknowledge the privileged position I have been able to take in looking at this case retrospectively, when it is of course far easier to make sense of things when not in the 'heat of battle'. As a clinician I fully understand how easy it can be sometimes to become blinkered in dealing with one aspect of a case (in [Ms A's] case trying to pin down a cause) which stops us from stepping back to look at all other aspects of a patient's problem. This case is a reminder to us all to keep remembering to do this, as the consequences of not doing so can be severe for our patients.

Please contact me if I can be of further assistance.

Rowan French
11/10/2020

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Further independent clinical advice to Commissioner

"**Reply to responses from [Dr B] and [the DHB]**

I am sure that [Dr B] was endeavouring to do [the] best for [Ms A] and acknowledge that the clinical situation was ambiguous at points.

1. With respect to commencement of multivitamins after surgery

Multivitamins can certainly cause nausea, particularly after sleeve compared to bypass for some reason. I agree that confidence in eating is important, but when progression to diet is significantly delayed then this philosophy could lead to even longer delays in restarting critical micronutrients. In this situation alternative forms of tolerable supplementation should be sought, such as chewable or dispersable vitamins. I am pleased to hear [Dr B] has adopted an 'as soon as tolerated' policy which I think is in line with most of that work in this field, and I also think adding a thiamine tablet to be taken immediately is excellent practice (as they are small and very easy to tolerate).

I continue to agree with [Dr B] that preop nutritional counselling and screening was satisfactory. Starting or continuing multivitamins I believe is good practice, and it was likely as [Dr B] states, that [Ms A] was replete in micronutrients going into surgery. Given the body's inability to store large reserves of thiamine however, this doesn't prevent deficiencies developing.

2. With respect to hunt for a cause of the symptoms

I don't agree with [Dr B's] comment that 'an obstructed sleeve presents with vomiting and food intolerance early in the postoperative period ie prior to discharge on Day 2'. The largest series of gastric sleeve obstruction/twisting was the paper by Abd Ellatif et al (1) which reports on 45 patients with sleeve twisting (out of a restrospective series of 3634 patients — 1.23%). The mean time of presentation to hospital for these patients was 59.8 days.

I am happy to take [Dr B's] reassurance and that of [Dr D] that there was no coercion related to the report issued for the contrast swallow on 6/11/18. As mentioned in my report, I regard two way discussion of radiology procedures as very important for good patient

outcomes. It may be that when [Ms A] notes in her complaint letter '[Dr B] then told the Radiologist [Dr D] off for showing me my results and told [Dr D] off and to change the report as it was wrong' that she misinterpreted what [Dr B] told with regards to the discussion.

3. With respect to consent for appendicectcomy

With regards to the decision to proceed to appendicectomy — I agree that it was reasonable to eventually proceed to remove the appendix, given two CT scans showing evidence of possible mild/early appendicitis. That being said it is evident from the notes that the clinical team realised that the clinical presentation was highly inconsistent with early appendicitis. In addition the patient appeared confused about the diagnosis immediately prior to the appendicectomy and the social worker visit on that day states 'Pt states communication is not good and wants a report about her condition'. [Dr B] states that part of the preoperative discussion with [Ms A] included the chance that removing her appendix might not fix the problems. Unfortunately there is no documentation either in the notes or on the consent form of this important piece of information. I am left thinking a better documented consent process would have been helpful here, as we can't be certain what [Ms A] was told.

It is stated that a discussion was had prior to discharge about re-starting multivitamins. There is no way to corroborate this either way as there is no note made with respect to it.

4. With respect to the extent of nutritional intake during the whole episode

[Ms A] does seem to have had some temporary relief after the endoscopic balloon dilatation on 23/11/18, however from the 29th through to 3/12/18 there was daily vomiting, leading up to discharge on 6/12/18. So I don't believe the relief was consistent enough to be confident it would solve the problem. Once again with regards to the discharge documentation we can't be sure what was said with regards to restarting multivitamins, although [Dr B] believes she was told to restart. [Ms A's] query to [Dr B] by text on 8/12/18 as to when vitamins should be started suggests to me that it wasn't strongly emphasized on discharge, if mentioned at all.

[Dr B] has provided a list of days when there was some food intake. Whilst there may have been some purée intake on these days the list gives an incomplete picture of a patient that never really consistently recovered right up until the last dilatation which probably fixed the problem. My review of the fluid/food charts and nursing notes indicates substantial troublesome vomiting throughout

14 November — 'ongoing nausea and vomiting'

16 November — 500ml vomit, ongoing nausea

17 November — vomiting at 0945 and 1600

18 November — fluid chart reports one vomit

19 November — fluid chart reports 2 vomiting episodes

20 November — fluid chart reports 3 episodes of vomiting

21 November — 'small amounts of clear fluids, no vomit noted'

22 November — one vomit according to fluid chart

23 November — one vomit according to fluid chart

24–26 November — appears temporarily improved after first dilatation

27 November — one vomit according to fluid chart

29 November — two vomits according to fluid chart

30 November — one vomit according to fluid chart

1 December — 4 vomits reported on fluid chart

3 December — 4 vomits reported over the previous 2 days (patient was on leave)

4–6 December — patient appears temporarily improved

11 December — readmitted with more vomiting

13 December — two small vomits

14 December — only 200ml oral intake

15 December — vomiting reported overnight

16 December — 'occ vomit'

17 December — 2–3 vomits overnight

20 December — a pattern of improvement after the final dilatation but still occasional vomiting (on 21st and 24th).

So the fact that on some of these days the patient may have been attempting to eat and holding down some elements of the diet doesn't detract from the persistent troublesome vomiting which puts a post-bariatric patient at risk of micronutrient deficiency, particularly thiamine (B1). [Dr B] states in reply that 'from the time of the original operation and over the period of 3 admissions … [Ms A] was intermittently and for days and even weeks tolerating a puréed diet and, we thought, oral vitamin supplantation' is, I believe, a gross over-estimation of her nutrient intake. Information from the family and [Ms A] refer to her being 'constantly sick' on more than one occasion. The non-prescription of even an oral multivitamin while [Ms A] was in hospital suggests to me that it was more likely forgotten about.

[Dr B] states that dietician input was less relevant in the setting of patient who isn't tolerating oral intake, although as [Dr B] emphasizes there were times when [Ms A] was tolerating some oral input. I believe a dietician could have been helpful in optimizing these sporadic opportunities, and also have likely taken a more holistic view with respect to micronutrient/vitamin status.

5. <u>With respect to thiamine deficiency</u>

[Dr B] discusses some information with regards to thiamine taken from an expert in the field of thiamine itself. I accept that assays assessing body thiamine stores are not 100% accurate, and I accept there is no way to be 100% certain that her neurological symptoms were a

result of thiamine deficiency. However in this situation 'if it barks like a dog it's probably a dog' applies and it does appear by far the most likely cause, certainly more so than rarities such as Charcot-Marie Tooth. I disagree that thiamine deficiency is more common after 'more radical procedures'. Postoperative nausea and vomiting is the most likely scenario associated with thiamine deficiency (2) and is generally more common after gastric sleeve than gastric bypass in my experience, and in the bariatric literature. Poor food tolerance in the postoperative period is a more important factor than site of absorption with regards to thiamine deficiency.

In summary, I accept this was a difficult case, and the symptoms waxed and waned to some degree. In my view however, the patient's nutritional intake over a period of at least 6 weeks was inconsistent, and devoid of adequate micronutrient intake. I totally understand how easy it is to focus on solving the underlying problem (we have all done this at some time), whilst perhaps not attending to what may seem a relatively minor element of care. However I don't believe it is good enough to rely on the patient to attempt self-medication of vitamins at home during short periods between hospitalizations, instead attempts to provide vitamin supplementation should have occurred in hospital. This should have been at least partially by the intravenous (or intramuscular) route.

I have read the changes in practice that [Dr B] describes. They are 'spot on' and will prevent any similar future problems.

There is no new information that would lead me to change my view on the case, with additional comments as above. There is no new information that would lead me to alter my opinion on departures from accepted standards.

Rowan French

1. Abd Ellatif et al. Management Options for Twisted Gastric Tube after Laparoscopic Sleeve Gastrectomy. Obes Surg (2017) 27:2404–2409
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