

# Nursing of a lactating patient with superior mesenteric artery syndrome: a case report

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## Shanshan Jin, Hua Zhou and Wenrui Li 💿

## Abstract

Superior mesenteric artery syndrome (SMAS) involves duodenal obstruction caused by compression of the horizontal section of the duodenum between the superior mesenteric artery and abdominal aorta. Here, the experience of nursing a lactating patient with SMAS is summarized. Nursing care was performed according to a multiple therapy approach of treating the SMAS in addition to particular psychological factors that may be present during lactation. The patient underwent exploratory laparotomy under general anaesthesia, duodenal lysis, and abdominal aorta–superior mesenteric artery bypass with great saphenous vein grafting. The key nursing care included pain control, psychological care, positional therapy, observation and nursing care of fluid drainage and body fever, nutrition support and discharge health guidance. Through the above nursing methods, the patient was eventually able to return to a normal diet.

## Keywords

Superior mesenteric artery syndrome, lactation, nursing, nutrition, case report, benign duodenal stasis syndrome

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## Introduction

Superior mesenteric artery syndrome (SMAS), also known as benign duodenal stasis syndrome or Wilkie's syndrome, is characterised by chronic duodenal obstruction caused by compression of the horizontal section of the duodenum between the superior mesenteric artery and the abdominal aorta, due to low origin of the superior

Department of Vascular Surgery, Beijing Friendship Hospital, Capital Medical University, Beijing, China

#### **Corresponding author:**

Wenrui Li, Department of Vascular Surgery, Beijing Friendship Hospital, Capital Medical University, 95 Yong'an Road, Beijing, 100050, China. Email: li\_wenrui@bjmu.edu.cn

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mesenteric artery, high insertion of the ligament of Treitz and other abnormalities.<sup>1,2</sup> SMAS is usually associated with individuals who are thin or underweight, and the incidence rate of SMAS is 0.13‰-0.3‰.<sup>3</sup> The main clinical symptoms of SMAS are recurrent epigastric pain, fullness, and nausea after meals, accompanied by intermittent vomiting, resulting in malnutrition and anaemia.<sup>4</sup>

Cases of SMAS have rarely been reported in breast-feeding women. As a special population, postpartum hormone changes and the need to care for and feed newborns may easily lead to anxiety and depression in novice mothers.<sup>5</sup> Postpartum depression is a common and serious mental health problem,<sup>6</sup> and lactating mothers are reported to be affected by changes in steroids and peptide hormones, with a global postpartum depression incidence rate of up to 15–30%.<sup>7,8</sup> Postpartum depression affects patients' appetite and may lead to significant weight loss, which is one of the risk factors of SMAS.<sup>3</sup> Failure to administer timely and effective treatment to a breast-feeding patient with SMAS may not only seriously endanger the physical and mental health of the patient themself, but also directly affect growth of the infant and family life. The present case report describes the authors' clinical experience of the treatment and nursing of a breast-feeding patient with SMAS who was admitted to Beijing Friendship Hospital in China. After careful treatment, timely and effective nutritional support and nursing, the patient was successfully treated and returned to a normal diet.

## **Case presentation**

Case reports are exempt from the requirement of IRB approval at Beijing Friendship Hospital, Capital Medical University, Beijing, China. Written informed consent was obtained from the patient for publication of this case report and accompanying images, and all patient details were de-identified. A copy of the written consent is available for review by the Editor of this journal. The reporting of this study conforms to CARE guidelines.<sup>9</sup>

## General data

A 28-year-old female patient was hospitalized at Beijing Friendship Hospital, China, in May 2020, for repeated nausea, vomiting, anxiety and postprandial pain for the previous 2 months. The patient was lactating and presented at 5 months after a natural and uneventful delivery. The patient reported that her symptoms were aggravated by supine positioning. She was otherwise in good health and had no history of trauma or surgery before this hospitalization. Physical examination showed that the patient was malnourished with a body mass index of  $16 \text{ kg/m}^2$ , and the patient reported that her weight had dropped by 7 kg over the previous 2 months. Palpation and percussion showed slight abdominal swelling and tenderness of the upper abdomen. Other routine examinations were unremarkable. Laboratory test results revealed poor nutritional status: total protein 53.2 g/l, albumin 35.3 g/l, globulin 17.9 g/l, total cholesterol 2.41 mmol/l, and triglyceride 0.36 mmol/l. Gastroscopic examination showed that the third portion of the duodenum was compressed by external structure, so that an enteral feeding tube could not be placed. Upper gastrointestinal angiography showed delayed gastroduodenal emptying, and the contrast medium was 'cut off' vertically in the horizontal portion of the duodenum (Figure 1a). Abdominal contrastenhanced computed tomography examination showed that the duodenum was compressed (Figure 1b), the left renal vein was narrow, the retroperitoneal adipose tissue was scarce, and the SMA/aortic angle was decreased to 13.7° (Figure 1c). The patient was diagnosed with SMAS through the above results. After admission, the patient's



**Figure 1.** Preoperative images from a 28-year-old lactating patient who presented with repeated nausea, vomiting, anxiety, postprandial pain and weight loss: (a) upper gastrointestinal angiography image showing obstruction of the horizontal portion of the duodenum by the superior mesenteric artery; (b) computed tomography (CT) image in axial plane, showing duodenal compression (red arrow); and (c) CT image in sagittal plane showing the angle between the aorta and the superior mesenteric artery (measured to be 13.7°).

condition was complicated by weight loss, anaemia, malnutrition, water electrolyte and acid-base balance disorder, and emotional changes. The patient was given parenteral nutrition support, pain care, and psychological care, however, her symptoms were not significantly relieved. After 2 months of conservative treatment, the patient's symptoms did not improve, and because the patient was in a postpartum state, there was a need to resume breastfeeding as soon as possible. After the patient provided informed consent to surgical treatment, she underwent exploratory laparotomy under general anaesthesia, duodenal lysis, and abdominal aorta-superior mesenteric artery bypass with great saphenous vein grafting. The operation was successful, and the patient recovered well and was discharged uneventfully. During 6 months of post-operative follow-up, the patient was in good physical condition, the symptoms of nausea and vomiting were completely relieved, and her postoperative weight increased by 9 kg.

Adequate perioperative nursing care was provided for successful completion of the treatment, as described below.

#### Nursing care

Pain management. The patient's pain was scored during hospitalization using the international Numeric Rating Scale (NRS); an 11-point scale with 0 being no pain and 10 being the worst possible pain. Pain scores were classified as follows: mild pain ( $\leq 3$ points), moderate pain (4-6 points), and severe pain ( $\geq$ 7 points). During hospitalization, the patient had obvious pain symptoms, and the patient was treated with multi-mode analgesia according to the different reported grades of pain. For severe pain, 50 mg pethidine hydrochloride (intramuscular injection [i.m.]), 10 mg morphine (hypodermic injection), or 100 mg flunarizine hydrochloride (i.m.) were administered combined with 50 mg promethazine (i.m.). For moderate pain, 100 mg tramadol hydrochloride (i.m.), 50 mg flurbiprofen axetil

(intravenous injection) or 30 mg papaverine (i.m.) were administered. Mild pain was mainly relieved by psychological nursing. The nurses formulated suitable pain intervention measures and improved the patient's pain through accurate, timely and objective evaluation. The patient reported that pain symptoms were aggravated when in the supine position, and the nurse helped relieve the patient's pain by advising the patient to change to the knee-chest position. Psychological intervention was also a necessary means of pain treatment.

Psychological care. The patient initially presented with depression, and rejected communication and treatment interventions. During hospitalization, the patient underwent psychiatric assessment and was diagnosed with anxiety and depression. She was administered 0.5 mg lorazepam, orally, once nightly; 5 mg olanzapine, orally, daily; 0.5 mg escitalopram oxalate, orally, twice daily; and 10 mg flupentixol melitracen, orally, daily, as directed by the physician. The nurse explained the diagnosis of SMAS to the patient, in addition to the necessity and method of treatment in detail. To give the patient confidence, the nurses shared successful cases of other patients with the same disease, informed the patient that a gradual recovery process was needed, and advised that only by actively cooperating with treatment, could she have the opportunity to restore normal diet, work and life. In order to help the patient improve her mood, nurses guided the patient to read books and listen to music appropriately, in order to ease her tension, and adjust her psychological state. Through medication therapy combined with psychological intervention, the patient actively cooperated with treatment and nursing, and established the confidence to overcome the disease.

Observation and nursing care of fluid drainage and fever. After surgery, the patient was fitted with a gastric tube, urinary tube, jejunal nutrition tube and drainage tube. The quantity, colour, and characteristics of the draining fluid was closely observed, and the patient was taught the methods and precautions in managing the reserved lines, to prevent any tubes from slipping. The patient experienced fever several times following the surgery, but her body temperature did not exceed 38°C, so physical cooling was the first choice of treatment. This was achieved by warming 0.9% saline ice bags until the ice was semimelted into frosty water, so that the bags were soft and easy to place, and increased the heat dissipation area in contact with the forehead. After treatment, the patient's body temperature returned to normal.

Nutrition support and discharge guidance. The patient was hospitalized with wasting, anaemia, malnutrition, and water electrolyte and acid-base balance disorder. During hospitalization, the patient was initially administered full parenteral nutrition through a left subclavian deep vein catheter. The patient retained the gastric tube and received gastrointestinal decompression to fully prepare for the operation. After the patient recovered from surgery, she was discharged to home with a jejunal nutrition tube. As the jejunal nutrition tube crossed the compressed horizontal segment of the duodenum, it reached the proximal jejunum, avoiding gastric storage and food reflux, so as to achieve the purpose of enteral nutrition. The nurse instructed the patient to take adequate enteral nutrition every day at home for gastrointestinal nutrition through the tube. When the patient returned to hospital for re-examination 50 days after surgery, she changed to gastric tube for continuous enteral nutrition. After a further 4 months, the patient ate orally without symptoms. The nurse instructed the patient to eat liquid food, such as rice soup, lean meat soup and milk, while at the same time slowing down the rate of eating and increasing the duration of a meal. The principle of eating was from less to more. Meanwhile, the family members of the patient were instructed to observe whether she had symptoms of abdominal distension, vomiting and gastric retention, and if there were no recurrent symptoms, increase the diet according to the actual situation. Following this plan, the patient achieved a completely normal diet.

Health education. Nurses also provided the patient with the following health advice during treatment: (1) The patient was instructed on appropriate activities. For example, not to lift more than 5 kg within the first 6 weeks after surgery, to exercise at moderate intensity (such as walking), and to gradually increase endurance; (2) The patient was instructed about diet. After resuming oral feeding, she was advised to adopt a balanced, high calorie and high protein diet, with more fresh vegetables and fruits, and to exclude stimulants, such as tobacco and alcohol; (3) The patient was advised that complete recovery of intestinal function would take a period of time, and that during recovery, it would be normal to have loose stools and increased frequency of bowel movements; and (4) The patient was advised to have regular check-ups, and to seek medical advice in a timely manner in case of discomfort, such as abdominal distension and pain.

## Discussion

Superior mesenteric artery syndrome may occur at any age, but is more common in emaciated young and middle-aged women, as well as in patients with rapid weight loss, long-term bed rest or spinal protrusion.<sup>10</sup> Due to its nonspecific clinical manifestations, SMAS is often misdiagnosed as

gastritis, functional dyspepsia, chronic peptic ulcer or nervous vomiting, with an estimated misdiagnosis rate of 57.1–67.3%, resulting in increased pain to patients.<sup>4</sup> Early diagnosis and surgical treatment may prevent gastroduodenal dilatation and may improve symptoms and quality of life.<sup>3</sup> In the present case, the patient was in the postpartum lactation period, and hormone levels at this particular stage may lead to great emotional fluctuation, which increases the difficulty of nursing. Personalized care should be developed for patients through an evidencebased approach, while observing and recording changes in the patient's condition.

Pain is a common postoperative symptom of patients. In the process of pain management, the primary responsibility of nurses is to screen, evaluate, and record the patient's pain, and report to the doctor for timely treatment, as required. During hospitalization, the patient in the present case was treated with multi-mode analgesia for different pain grades, according to other studies.<sup>11,12</sup> The psychological factors of patients with SMAS and psychological disorders are often ignored in clinical practice. Considering that the present patient was 5 months postpartum, due to the pain and distress related to the disease in addition to changes in postpartum hormone levels, it is easy to understand the development of postpartum psychological depression, moreover, digestive dysfunction related to depression often reduces the living and working ability of patients.<sup>12</sup> According to the actual situation of the patient, they should be guided to establish treatment confidence, effective nursing care should be provided, low patient mood and poor psychological status should be alleviated, and patients should be enabled to actively engage in treatment and recover as quickly as possible. As with other patients with SMAS, the symptoms

worsened in the present case when in the supine and right lying positions; the nurse relieved the patient's pain by changing the patient to the knee-chest position. Antidepressant medication and psychological counselling may improve a patient's mood, and an increase of adipose tissue may improve the angle between the aorta and SMA, alleviating the clinical compression symptoms of SMAS.<sup>13</sup> Regarding enteral nutrition, continuous and effective drainage is important for observation and protection against infection. If the line care is inadequate, related complications will occur.<sup>14</sup> Therefore, it is necessary to properly fix and handle all lines to keep them unblocked and prevent them from being compressed and twisted. Early enteral nutrition was one way in which the current patient was helped to recover, and following post-surgical recovery, she was discharged to home with a jejunal nutrition tube. As the jejunal nutrition tube crossed the compressed horizontal segment of the duodenum, it reached the proximal jejunum, avoiding gastric storage and food reflux, so as to achieve the purpose of enteral nutrition. Early enteral nutrition may increase visceral blood flow, promote the recovery of gastrointestinal function, and reduce the displacement of intestinal bacteria.15,16

Enteral nutrition should follow the principle of 'from less to more, step by step'. A small meal every time, so as to reduce duodenal tension, gradually increase the patient's food intake, increase nutrition, restore retroperitoneal fat, and increase the angle between the SMA and abdominal aorta.

The above nursing measures, including pain management, psychological care, observation and nursing care of drainage, nutrition support, and health guidance, not only ensured the success of the current patient's surgery, but also provided a basis for smooth recovery and return to normal life. The risk of perioperative injury was effectively controlled, and because of the patient's smooth postoperative recovery, her eating disorder and depression symptoms were resolved.

The current patient's perspective on the treatment provided changed dramatically throughout the whole process. As described above, the patient initially presented with depression, and rejected communication and treatment interventions. However, with continuous guidance and positive treatment effects, she not only gradually trusted the nursing staff, but also became more cooperative with the treatment measures during her hospitalization and subsequent recovery. Eventually, she was satisfied with the overall management of her treatment, which also forms the basis for an ideal therapeutic effect.

Because cases of SMAS in lactating patents are rare, information regarding perioperative nursing of such cases is limited. To the best of our knowledge, this is the first report of a perioperative nursing experience of SMAS in a breast-feeding patient. The present report summarizes our nursing experience combined with discussion of the relevant literature, which may be useful for guiding perioperative nursing of this type of patient. It is hoped that the findings will be helpful for the rehabilitation of such patients, however, there are limitations in the present nursing study: because the nursing intervention was carried out in a single case, some measures may not be applicable to other patients, due to differences between individuals. Therefore, more research into the treatment and nursing care of lactating patients with SMAS is required to support the results of the present case study.

## Conclusion

Superior mesenteric artery syndrome in a lactating patent is a rare condition. In the

present case, the patient was treated with abdominal aorta-superior mesenteric artery bypass and a good therapeutic effect was achieved. Successful nursing care was performed according to the combined therapy of SMAS and particular psychological factors related to lactation. These nursing measures included pain management, psychological care, positional therapy, observation and nursing care of fluid drainage and body fever, and nutritional support. Additionally, guidance for discharge and follow-up were wellperformed. Through the above nursing methods, the patient was eventually able to return to a normal diet.

### **Author contributions**

SSJ was involved in protocol/project development, data collection and management, data analysis and manuscript writing. HZ was involved in project development, image collection, data analysis and manuscript writing. WRL was involved in project development, manuscript review and editing. All authors have read and approved the manuscript.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## **Declaration of conflicting interests**

The authors declare that there is no conflict of interest.

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## ORCID iD

Wenrui Li D https://orcid.org/0000-0003-0560-3292

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