CASE REPORT
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Extreme Obesity Treated with Integrated Traditional Chinese and Western Medicine and Construction of an Innovative Obesity Diagnosis and Treatment Model: A Case Report

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Author contributions

The manuscript was written by Jia Zhang, Miao Peng, Xiang-jun Sun, and reviewed and edited by Jing-jing Huang, Xi Xu, Yi Lv, Ka-ni Ou-yang, Jing-zhi Wang provided hospital medical care for the patient and followed up his condition after discharge. All authors have read and approved the final manuscript. Jia Zhang, Miao Peng, Xiang-jun Sun contributed equally to this work. Ming-zhong Xiao was responsible for guiding the whole process of diagnosis and treatment of the patient and sorting out this case report.

Competing interests

The authors declare no conflicts of interest.

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Peer review information

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Abbreviations

TCM, traditional Chinese medicine; GERD, gastroesophageal reflux disease; EF, ejection fraction; FS, fractional shortening.

Citation

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Abstract

Background: The incidence of obesity is increasing each year, and is often accompanied by multi-system metabolic disorders, typically chronic diseases and multi-disease superposition disease states. Metabolic surgery is an important treatment option for patients with extreme obesity; however, surgical difficulties and perioperative complications are more serious in these patients. Therefore, there is an urgent need for a new comprehensive diagnosis and treatment model to reduce the weight of patients prior to surgery, subsequently reducing the risks of surgery. **Case summary:** This model combines traditional Chinese medicine (TCM), external TCM treatment, and health management with western technique of metabolic surgery. Obesity is recognized and treated by multidisciplinary, multi-channel, and multi-means, constituting an innovative diagnosis and treatment model of obesity in integrated traditional Chinese and Western medicine. The application of this model in the treatment of a patient with extreme obesity having multiple systemic diseases is described herein. **Conclusion:** The integrated traditional Chinese and Western medicine obesity diagnosis and treatment model can be used for precise syndrome differentiation, individualized treatment, and follow-up management of patients with extreme obesity, with strong scalability and significant clinical efficacy.

Keywords: extreme obesity, integrated traditional Chinese and Western medicine, metabolic surgery, external treatment of traditional Chinese medicine

Introduction

Obesity is a serious public health problem endangering the health of our national residents. According to the absolute adult population, approximately 600 million people in China are currently obese, with obesity posing a problem for nearly half the Chinese people in maintaining their health [1]. Moreover, obesity is proven to be an important risk factor for chronic metabolic diseases, such as hypertension, insulin resistance, diabetes, cancer, and inflammation. The medical cost attributable to overweight/obese adults will exceed 400 billion yuan by 2030, accounting for approximately 21.5% of the total medical cost in China [2].

In 1998, the World Health Organization formulated diagnostic criteria for obesity. A BMI ≥ 30 kg/m^2 was defined as obesity, and BMI ≥ 50 kg/m^2 was defined as super/extreme obesity. Most patients with extreme obesity have severe obesity-related diseases, including hypertension, diabetes, cardiovascular and cerebrovascular diseases, obstructive sleep apnea-hypopnea syndrome, and gastroesophageal reflux disease (GERD) [3, 4], with their quality of life and health greatly threatened. Such patients are often unable to effectively control their weight through a controlled diet, exercise and other lifestyle adjustments, and even drug intervention. In such patients, metabolic surgery is often their preferred treatment [5, 6, 7]. The surgical difficulty and perioperative complications are more serious for patients with extreme obesity. Moreover, the efficacy of bariatric surgery in patients with extreme obesity is significantly reduced, and the proportion of weight regained postoperatively is high. Therefore, there is an urgent need for an innovative diagnosis and treatment model covering multiple links, such as preoperative conservative treatment to reduce the risks of surgery, and continuous follow-up to prevent weight regain postoperatively.

Case presentations

On July 22, 2022, a 33-year-old man experienced difficulty breathing for 1 month due to progressive weight gain for more than 1 year. During admission, the patient was 166 cm tall and weighed 170.9 kg, with a BMI of 62.0 kg/m^2. He presented with dyspnea which worsened after activity, an inability to lie down at night, sleep apnea, wakefulness during sleep, abdominal distension, severe skin damage in the lower abdomen and lower limbs, black color, hard press, mild edema in the abdomen and lower limbs, normal stool, and normal urination. He had no history of medicament use or allergies. His parents had no history of obesity and his father was diagnosed with cerebral stroke. Combined with the medical records of the previous hospital on July 21, the present patient was diagnosed as extremely obese with type II respiratory failure, obstructive sleep apnea syndrome, pulmonary infection, chronic kidney disease stage 3, and hypertension stage 3, after completing the imaging and biochemical examinations on admission.

Physical examinations

Physical examination revealed mental lethargy, eyelid swelling, low double lung auscultation breathing sounds, tachycardia, abdominal obesity, abdominal distension, middle and lower abdomen skin thickening and black, increase in skin temperature rise with slight depression, black skin on the lower limbs, increased skin temperature and mild edema in the lower limbs.

Laboratory findings

The glucose tolerance test was normal, though the insulin challenge test suggested insulin resistance. The patient had no substantial abnormalities in liver function or lipid levels. Key cardiopulmonary injury indicators and changes are shown in Figure 1.

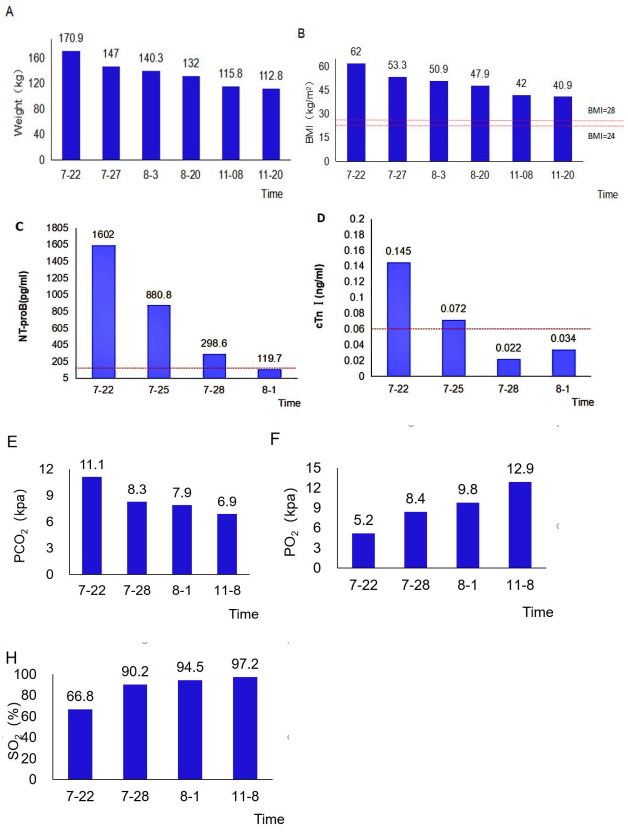

Figure 1 The key laboratory examination indicators. (A) Changes in body weight from admission to 3-month follow-up after metabolic surgery. (B) Changes in BMI from admission to 3-month follow-up after metabolic surgery. (C) Changes in NT-proB from admission to hospital until before Bariatric surgery. (D) Changes in cTn Ⅰ from admission to hospital until before Bariatric surgery. (E-H) Changes of key cardiopulmonary injury indicators (PCO2, PO2, PH, SO2) from admission to 3-month follow-up after metabolic surgery.

Imaging data

Chest and abdominal computed tomography showed hypostatic changes in the lower lobes of both lungs, pleural effusion, and a severe fatty liver (Figure 2).

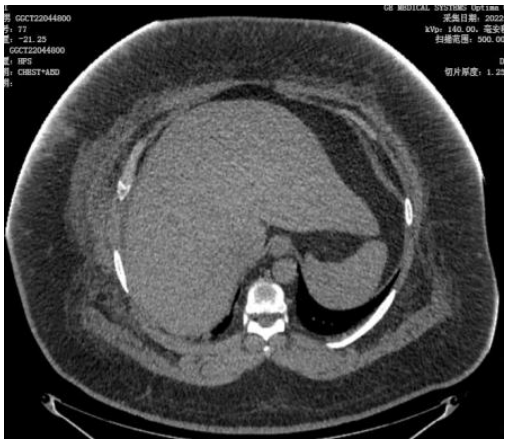

Figure 2: CT image of the patient's lungs and abdomen at Jul.22.2022. Hypostatic changes in the lower lobes of both lungs; cardiomegaly; right pleural effusion; seroperitoneum; severe fatty live.

Other examinations

Color Doppler ultrasound revealed enlargement of the left heart, left

ventricular systolic and diastolic dysfunction, left ventricular ejection fraction (EF) 40%, Left ventricular fractional shortening (FS) 20%. Electrocardiography revealed premature ventricular contraction and T-wave changes in sinus rhythm.

Diagnosis, treatment, and follow-up

As shown in Figure 3, traditional Chinese and Western medicine were used to reduce the patient's body weight and surgical risk prior to metabolic surgery. This included oxygen inhalation, expectoration, asthma relief, diuresis, acid correction, circulation improvement, blood pressure control, and other symptomatic and supportive treatments of Western medicine.

Concurrently, external treatment with traditional Chinese medicine, including Chinese herbal compound, acupuncture, moxibustion, Chinese medicine foot bath, acupoint application, cupping, and other methods were administered for symptomatic treatment.

Health management in terms of diet, breathing, sleep, and exercise rehabilitation was implemented throughout the treatment, including adjustment of diet structure, implementation of total calorie control, guidance in respiratory exercise, respirator use, and encouragement to exercise.

To achieve long-term benefits, the combination of traditional Chinese medicine and Western medicine promotes rapid recovery after surgery.

On November 8, 2022, the patient revisited the hospital 3 months after surgery. There was no obvious dyspnea, wheezing, nausea, vomiting, loss of appetite, alopecia, abdominal distension, diarrhea, abdominal pain, or edema in both lower limbs. The patient wore a ventilator at night and slept normally. His food intake was significantly reduced compared with that before the operation. The patient's tongue was red, and tongue was thick and greasy. His pulse and vital signs were stable. The patient's body weight was 116.8 kg and BMI, 42.4 kg/m^2.

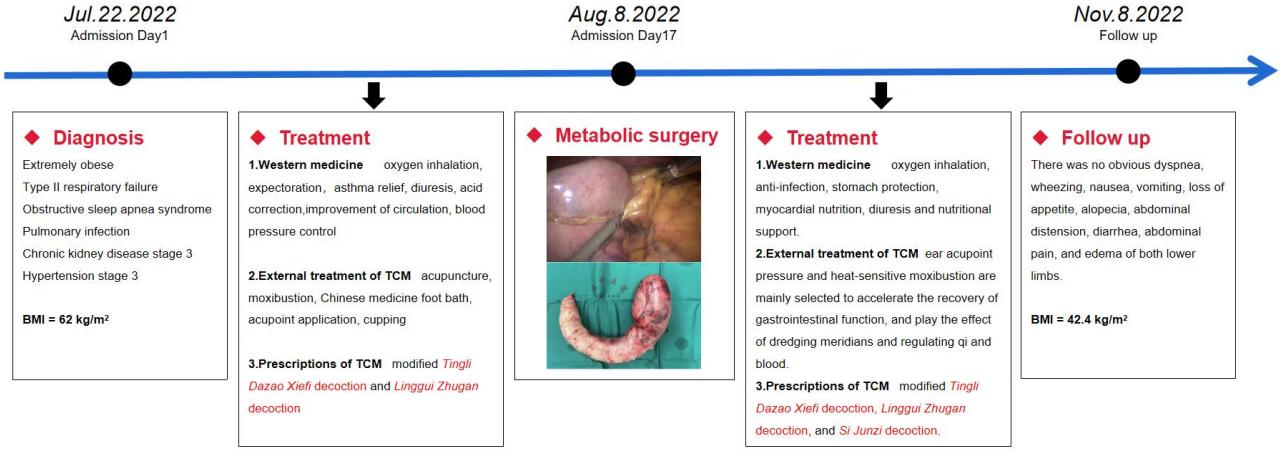

Figure 3: The whole process of diagnosis, treatment and follow-up of patient.

Discussion

Based on the diversity of the clinical manifestations of obesity and limited efficacy of single treatment methods, an innovative treatment method of integrated Chinese and Western medicine was proposed to enable patients with extreme obesity to undergo metabolic surgery. This was the first step to helping the patient maintain a safe physical state with Chinese medicine based on syndrome differentiation and acupuncture. In this case, the patient successfully lost 17.6% of his body weight within 10 days.

After surgery, electroacupuncture, auricular acupoint therapy, and heat-sensitive moxibustion were used to accelerate the recovery of gastrointestinal function. Moreover, Chinese medicine was used to help the patient recover from the virtual state, reducing his functional recovery and hospitalization time, and reducing postoperative complications to fewer than those experienced by general patients. In addition, treatment with Chinese medicine was continued after discharge, preventing weight gain outside the hospital and other practical clinical problems.

More time is needed to follow our patients changes, including collecting more data on his weight and possible gastrointestinal complications. Moreover, further studies are needed to prove the exact degree of efficacy of the new model and its mechanism. To some extent the new model shows an advancement of the theoretical system of state-target differentiation and treatment, explaining the necessity of combining traditional Chinese and Western medicine.

Conclusion

The innovative obesity diagnosis and treatment mode of integrated traditional Chinese and Western medicine combines the advantages of traditional Chinese medicine and Western medicine metabolic surgery. Moreover, the model is suitable for addressing complications associated with unstable vital signs, excess weight, and high risk anesthesia in patients with extreme obesity. The model also offers a solution to address the long-term problems associated with medical weight loss and difficulty in treatment compliance.

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