

Multi-Layer Tissue Injury of the Abdominal Wall Caused by Improper Treatment of Subcutaneous Hydrops After Liposuction

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Abstract: Liposuction has been popular with the public since its inception. The fat accumulated in the body is sucked outside the body through negative pressure suction, thereby reducing the fat cells in the body and achieving the effect of local plasticity. Although liposuction is a relatively safe procedure, due to the lack of correct judgment of the patient's condition and treatment by quite a few cosmetic practitioners, the complications of liposuction are gradually increasing. We describe a case of subcutaneous hydrops after lumboabdominal liposuction, which was found to have multi-layer tissue defects of the right lower abdominal wall and local peritoneal rupture after multiple sclerosing agent injections and two debridement procedures. This case provides us with a warning about the use of sclerosing agents.

Keywords: liposuction, lauromacrogol, multilayer tissue injury of the abdominal wall, reconstruction of abdominal wall

Introduction

As a cosmetic procedure, liposuction removes fat tissue to improve the body's contours. While reaping the cosmetic benefits, there is also a risk of local or systemic complications, such as irregularities in the skin, prolonged edema, local infections, persistent edema, fever, systemic infections, severe vein thrombosis, fat embolism, and even death.¹ The risk of complication rises as the volume of aspirate increases. The commonest minor complication of large-volume liposuction (LVL), which is considered as 3500mL or greater of total aspirate in a single suction, is seroma (6.78%), presenting the highest overall incidence.² This article reports a case of multi-layer tissue injury of the abdominal wall and local peritoneal rupture caused by repeated puncture aspiration, lacunar injection, and debridement scratching after LVL.

Case Presentation

A 54-year-old woman presented to our clinic with the chief complaint of protruding masses on the skin surface of the right lower abdomen with tenderness in the right lower abdomen and below the umbilicus. The patient underwent lumboabdominal liposuction at a medical institution, during which about 5500mL of fat was extracted (negative pressure liposuction, 500mmHg). The patient's body mass index (BMI) before liposuction was 28.42 kg/m² and had a history of two births. On the fifth day after liposuction, the patient developed swelling of the lower right abdomen, which was considered seroma by the institution. After puncture and aspiration, about 260mL of light red liquid was extracted. Afterward, puncture aspiration was performed every 3–4 days, and the amount of aspirated fluid was gradually reduced. During each suction process, the institution gave intracavitary injections of lauromacrogol, including four injections of 10mL and two injections of 15mL. About one month later, no liquid was then withdrawn. Whereas, the patient still had swelling and palpable undulation in the right lower abdomen. 10 days later, ultrasound-assisted aspiration was performed

on the patient and about 18mL red liquid was extracted. There was no decrease in aspirated fluid during the subsequent 10 days. Two months after the liposuction, the institution then performed surgery on the patient to scrape away the hydrops and a pressure bandage was applied after the operation. After surgery, the patient experienced persistent hopping pain and tenderness in the right lower abdomen, which was aggravated by coughing and sneezing. The pressure bandage was removed on the ninth postoperative day. Subsequently, a mass protruding from the skin surface appeared in the right lower abdomen, protruding when standing and receding when lying flat. The institution considered the mass to be due to tissue proliferation and scarring. Consequently, a second operation was performed to remove the mass. During the operation, there was a sudden local protrusion in the right lower abdomen, and local cellulite was found protruding in the process of incision and exploration. Due to limited conditions, repair surgery was not performed.

On the second day after the operation, the patient presented to our clinic with a mass in the right lower abdomen, and CT examination showed that the soft tissue of the right anterior abdominal wall was locally discontinuous, the anterior abdominal wall was filled with gas, and the abdominal wall was extensively exudated (Figure 1). Ultrasound examination showed multiple strong linear echoes in the subcutaneous fat layer. We then underwent surgery, during which we re-opened the previous surgical incision and found a soft tissue space in the superficial fascia layer, in which a large amount of light red fluid gushed out. Local defects of the rectus abdominis, transverse fascia, and peritoneum were observed at the bottom of the cavity, and omentum majus herniated from the defect. Since the defect was too large to be sutured directly, we dissociated the posterior sheath of the rectus abdominis and the transverse fascia space and covered the anterior bowel with omentum majus. We then sutured the fascia, muscle, and peritoneum to try to reduce the defect. Finally, we trim the polypropylene patch to the appropriate size to repair the defect (Figure 2).

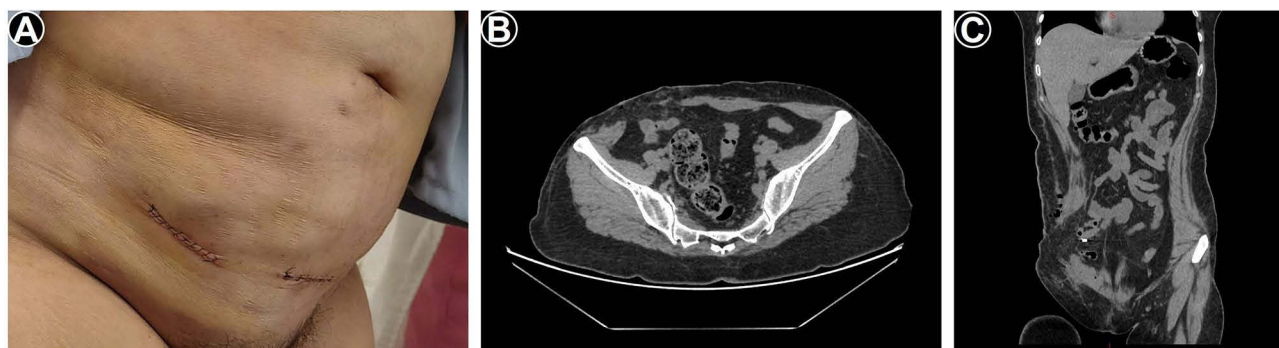


Figure 1 Preoperative symptoms and imaging examination of the patient. (A) The next day after the second surgery, the patient presented with a protruding mass outside the skin of the right lower abdomen. (B) Abdominal wall defect on cross-sectional CT. (C) Abdominal wall defect on coronal CT.

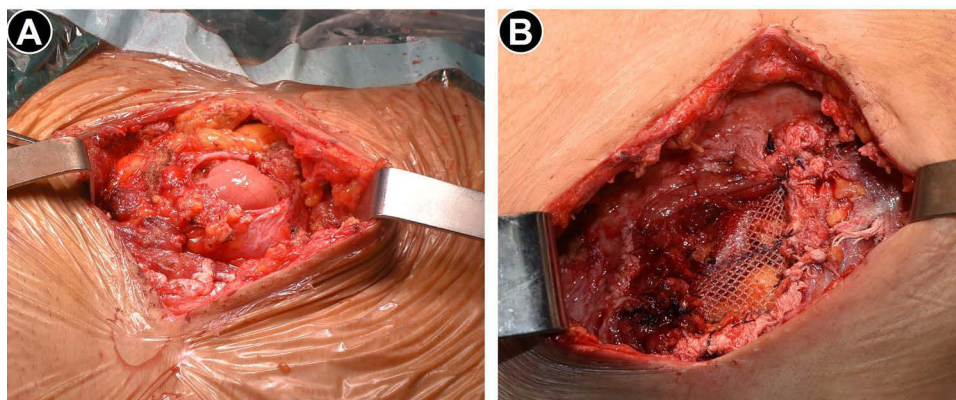


Figure 2 Intraoperative picture of the patient. (A) The defect of the abdominal wall structure was detected intraoperatively, and the abdominal contents protruded from the defect. (B) The abdominal wall defect was repaired with a polypropylene patch.



Figure 3 Postoperative pictures of the patient. (A) VSD was used to promote cavity healing and prevent the formation of fluid. (B) The wound healed well and no effusion occurred after VSD removal.

Continuous vacuum sealing drainage (VSD) was administered at 100mmHg and pressure bandage was performed after operation. We then performed two debridements, in which we found fresh granulation tissue covering the trabecular cavity, with the patch fixed in place, and continued to give VSD postoperatively. The patient recovered well after surgery and no discomfort or new symptoms occurred (Figure 3).

Discussion

Seroma, a usual postoperative complication of plastic surgery, is common after liposuction, especially LVL. Seroma is considered to be associated with excessive liposuction and inappropriate postoperative management, which is related to the dissection of the fascia of an area due to excessive treatment.³ The diagnosis of seroma mainly depends on clinical symptoms, physical examination, and imaging examination, among which ultrasound is an important mean in the diagnosis of seroma. The institute initially diagnosed the mass in the patient's lower right abdomen as seroma based on signs and symptoms. The diagnosis cannot be confirmed due to the lack of imaging tests such as ultrasound, so we can only diagnose subcutaneous hydrops retrospectively. Drains, stitches, suture techniques, preservation of Scarpa's fascia, and use of fibrin glue or sclerosing agents have been reported to reduce the occurrence of seroma.⁴⁻⁷ As a result of the diagnosis of seroma, intracavitary injection of sclerosing agents was used by the institute to treat the mass. Lauromacrogol, also known as polidocanol, is generally used as a sclerosing agent in clinical practice. It can adsorb and destroy the structure of the phospholipid membrane, leading to the formation of thrombus at the site of endothelial injury and subsequent occlusion of thrombus, thus achieving endovascular fibrosis and effective occlusion of the vascular lumen.⁸ Widely used in venous sclerotherapy, injection of lauromacrogol is also one of the treatments for seroma. Both liquid and foam forms of lauromacrogol have been reported for the treatment of seroma, and both have achieved remarkable efficacy.^{9,10}

In this case, the liquid form of lauromacrogol was injected into the lacuna several times at short intervals, which may be related to the injury of abdominal wall tissue. Certainly, large amounts of liposuction, mechanical injury caused by violent and rough operation during liposuction due to lack of experience and technique, and direct damage during subsequent debridement all caused tissue damage. But obviously, mechanical injury during surgery would not cause such serious tissue damage or even peritoneal rupture. Another part of the reason may be the use of lauromacrogol. Besides being used as sclerosing agent to treat vascular diseases, there are also reports that tissue necrosis may occur as a complication. The exact mechanisms of tissue necrosis are unclear. Extravasation of a sclerosing solution into the perivascular tissues, vascular occlusion due to intra-arteriolar injection, reactive vasospasm, injection of arteriovenous shunts, or excessive cutaneous pressure created by compression techniques may lead to tissue hypoxia and destruction.^{11,12} The combination of mechanical injury and the use of high-dose sclerosing agent resulted in tissue injury in the case. In addition, the following factors may also be involved in the occurrence of tissue injury: 1) high BMI and two previous births cause weakness in the abdominal wall; 2) inadequate pressure bandage after liposuction; 3) host stress response;

After detecting the abdominal defect in the patient, we attempted to repair the defect by separating and suturing the surrounding tissue appropriately. Nevertheless, the defect is too large to be repaired directly by sutures. Considering that the strength of the abdominal wall of the patient is weak and the blood supply of the surroundings may be poor, we chose mesh instead of a flap to repair the defect to prevent possible secondary abdominal wall injury and non-viability of the flap. After repairing the abdominal wall defect in this patient, negative pressure therapy (NPT) was applied to promote wound closure. NPT has shown a great effect on wound closure, including promoting wound healing after hernia repair. The use of NPT after hernia repair promotes both the formation of granulation tissue and the reduction of the cavity, and even shows great potential for the treatment of infected mesh.^{13–15} For this case, we used a polypropylene patch to repair the abdominal wall defect, followed by NPT to promote cavity healing. Considering a large amount of fluid was found during debridement, we applied VSD to prevent the appearance of fluid accumulation. Results showed that granulation tissue grew in the cavity and no fluid formation in the wound cavity.

Conclusion

In this article, we report a case of multilayered injury to the abdominal wall, even including the peritoneal. As one of the treatments for seroma after liposuction, few articles have reported the occurrence of such serious complications after the use of sclerosing agents. Hence the use of sclerosing agents should also be treated with caution.

Ethics Approval and Informed Consent

Ethical approval is not required for this study in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images. Institutional approval was not required for the case details.

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Disclosure

The author(s) report no conflicts of interest in this work.

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