

Small Intestinal Perforation and Peritonitis After Liposuction

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Abstract A case of small intestinal perforation and peritonitis after tumescent liposuction performed in an ambulatory setting elsewhere is presented. Only four other cases were reported earlier. In all cases, the diagnosis had been missed initially. Unique problems in diagnosis, preventive steps, and risk reduction are discussed.

Keywords Intestinal perforation · Liposuction · Peritonitis · Postoperative complications · Small intestine

Liposuction often is performed in an ambulatory setting, and the recovery usually is straightforward. Frequently, patients are not reviewed by the surgeon until after 3 to 5 days. Complications such as seroma and minor infection may occur but are not serious. One of the potentially fatal complications is penetration of body cavities and associated sequelae. Unfortunately, presentation can be obscure in the postoperative setting, and the patient may present late.

To date, 11 cases of body cavity penetration have been reported in the literature, 4 of which had small bowel perforation, resulting in 2 deaths [1, 7, 9, 10].

We present a patient who sustained a small intestinal perforation and peritonitis after tumescent liposuction performed elsewhere with the patient under sedation in an ambulatory setting. The patient presented after a 4-day delay in septic shock and suffered a cardiac arrest on the table during exploration. His initial diagnosis had been missed by the ambulatory care center. This highlights the

unique problems in the diagnosis of this complication, which if not treated promptly, carries a mortality rate exceeding 50% [10].

Case Report

A 63-year-old morbidly obese, hypertensive man (height, 172 cm; weight, 121 kg; body mass index [BMI], 40.8) was admitted through the emergency department with a history of increasing pedal edema, difficulty breathing, fever, abdominal distention, pain, and constipation for 2 days. He reported a history of a para-umbilical hernia repair and abdominal liposuction 6 days previously at an ambulatory center.

According to the surgeon's notes (obtained later), liposuction was performed at the center using the tumescent technique with the patient under deep sedation, and the hernia was repaired using Mayo's technique through an infraumbilical incision. The hernial sac contained omentum, and the fascial defect was about 0.5 cm in size. Injection of ceftriaxone 1 g was used perioperatively. The patient was discharged the same day with antibiotic (ofloxacin 400 mg twice daily), analgesics (diclofenac sodium 50 mg twice daily), and ranitidine.

At the first follow-up visit 3 days later, the umbilical wound was noted to be clean, and a remark was made about edema of the feet. After 2 more days, the edema was noted to be worse. No suspicion of peritonitis was mentioned. In fact, a referral to a vascular surgeon had been arranged to investigate the leg edema.

Day 5 after surgery, the patient noted increasing abdominal pain and inability to retain any food or drink. His condition deteriorated progressively until admission to our hospital.

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At admission, he looked very ill, pale, and short of breath. His vital signs included a temperature of 38.5°C, a pulse of 135 bpm, a blood pressure of 108/54 mmHg, a respiratory rate of 30/min, and an oxygen saturation of 88% on room air. His breathing was shallow and his mucosa very dry. He was incoherent and confused.

Chest examination showed fine basal crepitations. Extensive edema of the body was noted together with bruising and tenderness of the abdomen. Chest x-rays showed basal consolidation, and the emergency physician admitted him to the intensive care unit (ICU) because of chest infection and cardiac failure. Further abdominal examination by the intensivist showed diffuse tenderness, rigidity, and resonance on percussion. Bowel sounds were absent. Plain radiographs showed a pneumoperitoneum (Fig. 1).

Based on a working diagnosis of surgical sepsis, the general surgeon evaluated him and confirmed peritonitis. The plastic surgeon was asked to assess whether any correlation existed between the recent liposuction and the surgical sepsis. The plastic surgeon concurred with the diagnosis of peritonitis and considered the possibility of iatrogenic injury to the bowel with delayed perforation of hollow viscus.

Differential diagnoses of postoperative cellulites and necrotizing fasciitis were considered briefly but rejected. There were no cutaneous blebs, bullae, or crepitations, or any evidence of early skin necrosis.

Laboratory testing showed a hemoglobin level of 13.8 g/dl, a white blood cell count of 26,000, neutrophilia of 91.4%, and a platelet level of 310 K/ml. Arterial blood gas testing showed a pH of 7.49, a partial pressure of carbon dioxide at 27 mmHg, and a partial pressure of oxygen at 79 mmHg. Liver function tests were deranged, showing a bilirubin level of 33 $\mu\text{mol/l}$ (5–20), a low albumin level of 27g/l (32–55), and an electrolyte imbalance (sodium,

131 mmol/l; blood urea nitrogen, 14.9 mmol/l [2.5–7.0]; creatinine, 144 $\mu\text{mol/l}$ [60–120]).

After aggressive central venous pressure-guided fluid resuscitation and broad-spectrum antibiotics as well as gastrointestinal and deep vein thrombosis prophylaxis, the patient was mechanically ventilated because of acute respiratory failure. Direct confirmation by laparoscopy was followed by laparotomy, and the findings were as follows. There were approximately 3 l of purulent fluid in the abdominal cavity, with extensive thick exudates covering the small bowel. At systematic examination, we found three perforations in the midileum: one in the mesenteric border and two 20 cm distally in the antemesentric border close to each other leaking enteric contents (Fig. 2). There was bruising of the bowel wall as well. The umbilical hernia repair was noted to be intact. No other perforation in the anterior abdominal wall was noted.

The patient had severe bradycardia leading to cardiac arrest for less than 1 min. He was resuscitated by internal cardiac compressions and maximal inotropes.

The bowel perforations were freshened and closed with 3–0 PDS sutures, and the abdomen closed after extensive lavage and tube drains *in situ*. Postoperatively, elective ventilation and inotropes were continued in the ICU. The patient was weaned off the ventilator by day 7. He experienced ICU psychosis on postoperative day 8, and a computed tomography (CT) scan of the brain ruled out any organic brain damage. He was discharged from the hospital after 11 days.

Discussion

Liposuction is considered to be very safe for properly selected patients and is practiced widely even as an outpatient office procedure [1]. Tumescant liposuction, as introduced by Klein [6], has improved the safety and has avoided the need for general anesthesia with its associated



Fig. 1 Chest x-ray showing gas under the diaphragm

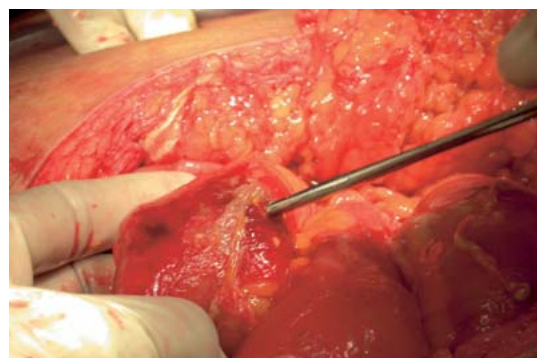


Fig. 2 Intraoperative view of small intestine perforation shown by pointer

complications [4]. The documented complications with this method are fluid overload and lidocaine toxicity [8]. Most plastic surgeons, however, use the superwet variation to avoid problems of fluid overload. The other major reported complications are pulmonary thromboembolism or fat emboli, anesthesia-related complications [3, 8], penetration of the peritoneum with or without visceral injury [1, 7, 9, 10], necrotizing fasciitis [1, 2, 5], and toxic shock syndrome [12].

Talmor et al. [10] reported a case of small intestinal perforation with peritonitis as a complication of liposuction in a 50-year-old previously healthy woman who presented to an internist 3 days after her procedure with abdominal pain, fever, and constipation. She was referred to the emergency department of a local hospital, where absence of free gas on plain x-rays required a CT scan to confirm the diagnosis of hollow viscus perforation. Six enterotomies encompassing a 5-foot segment of the bowel were encountered.

Ovrebo et al [7] presented a case of perforation peritonitis in an abdomen subjected to multiple operations after touch-up syringe-assisted liposuction had been performed in the office with the patient under local anesthesia. This patient presented early with pneumoperitoneum shown on plain radiographs.

Barillo et al. [1] reported two cases of necrotizing fasciitis, one with associated intestinal perforation. This case had been managed by a family physician as an office procedure, and the patient, although reporting escalating pain and ill health, was seen by the operator only after 7 days and referred to emergency service. By that time, bowel perforation was obvious because intestinal juice was draining from the cannula site. This patient eventually died 25 days after liposuction.

Sharma et al. [9] reported a fatal case in which associated breast augmentation also had been performed. In this case, the patient felt unwell on the first day, had escalating pain and some foul odor on day 2, and was seen on postoperative day 3 by the surgeon, who adjusted the analgesics. On day 4, she was hospitalized in profound septic shock with a diagnosis of necrotizing fasciitis. During urgent debridement for this condition, a bilious fluid leak was seen from two defects in the rectus fascia on the right without any adjacent hernia. This finding led to a laparotomy and the finding of four perforations requiring a bowel resection. The patient died within 24 h after surgery.

In the current case, the diagnosis was missed at the initial review by the operating team, and the patient presented to the emergency department of our hospital in severe shock 6 days after liposuction. A diagnosis of perforation peritonitis was not immediately suspected because the case of the obese, edematous 63-year-old man appeared to be consistent with cardiac failure. The intensivist

suspected abdominal sepsis and sought a surgical opinion. This case and the other described cases clearly demonstrate that the diagnosis of bowel perforation in the postliposuction scenario is not easy. However, all the patients felt unwell and had increasing pain from the first day, presumably after the effect of any sedation wore off. Just as consistently, they either were not seen early or, if seen, the seriousness of their condition was not recognized.

It is pertinent to remember that the usual postoperative course after liposuction is not very painful, and the pain usually decreases with passing days. The described patients all presented eventually to emergency departments, where the emergency physician needed to consider bowel perforation as a possibility. The initial difficulties in the current case stemmed from the fact that the patient had visited the original surgeon twice and was reassured about the abdominal pain, which he reportedly felt from the first day. Signs masked by the concurrent use of broad-spectrum antibiotics also are relevant in this case.

The authors believe that a “back to basics” approach should make the diagnosis clear. In the case of a septic or febrile patient with serious dehydration and abdominal pain after liposuction, the clinician should seriously consider peritonitis, with all efforts directed toward that possibility. A close differential diagnosis is necrotizing fasciitis [1, 2].

Later in the clinical course, other manifestations of sepsis such as respiratory complications, anuria, edema, and lack of clear history may confound the emergency physician, leading to consideration of other possible diagnoses. Bruising, tenderness, and swelling may be attributed to liposuction unless the emergency physician is aware of the usual benign postoperative course in modern liposuction cases. The presence of intraperitoneal gas or gas in tissue planes on plain x-rays is very significant, although the absence of gas does not negate the possibility [7, 10]. A CT scan of the abdomen would pick up intraperitoneal gas or gas in tissue planes [9, 10], but patients may be too critically ill for a CT scan. A preliminary laparoscopy can be recommended to confirm the diagnosis and to guide the laparotomy incision.

Bowel perforation during liposuction is potentially fatal because of the unpredictable internal injury that can be caused even by a blunt cannula. Multiple enterotomies were found in all five reported cases (including ours), and this together with the delays in diagnosis and access of the bowel contents to the vast absorptive surface of the liposuctioned subcutaneous areas possibly led to septic shock and the high 50% rate of mortality observed.

It is pertinent to investigate the risk factors for this grave complication with a view to prevention. An abdomen subjected to multiple operations, visceraally obese patients with protruding dome-shaped tense muscles, and associated hernias are obvious risk factors. An overstretched

musculature in the viscerally obese subject is thin and offers little resistance to cannula entry. The entry may even go unsuspected.

Areas previously subjected to surgery have hardened tissues requiring greater application of force. Proper and constant monitoring of the cannula tip by the surgeon's inactive hand is paramount. The surgeon must at all times "see" the location of the cannula tip. Hyperextension of the abdomen by placement of a pillow under the lumbar spine has been recommended as a measure for directing the cannula in a tangential direction, thereby reducing the chances of perforation [11]. Proper training of the surgeon cannot be overemphasised. With physicians of varying backgrounds currently performing ambulatory liposuctions in many parts of the world, any perforation is likely to be missed because the doctor may not have the necessary experience [1]. Associated hernia is a definite risk factor [7]. In such cases, if the hernia is to be opened, centrifugal suction from an open approach is better than centripetal suction.

Another relevant issue is whether a patient under sedation and infiltration analgesia experiences the pain of peritoneal penetration, and whether that can serve as a warning to the surgeon. Apparently, in practice, this theoretical argument in favor of tumescent liposuction did not hold true in the described cases, possibly because diffusion of local anesthetic numbed the parietal peritoneum.

Finally, patients reporting abdominal pain after liposuction must be considered suspect and evaluated very carefully, indeed without any denial on the part of the surgeon. The patients must have clear access to the surgeon for any serious feeling of being unwell.

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