

## Methicillin-Resistant Superinfection of the Wound After Body-Contouring Abdominal Surgery

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### Abstract

**Background** This report presents the case of a patient who underwent abdominal body-contouring surgery, then later experienced a severe deep infection and a methicillin-resistant (MRSA) superinfection.

**Case Report** A 56-year-old female ex-smoker presented, after massive weight loss, with skin excesses on the abdomen and flanks. She underwent an abdominoplasty with muscle plication and flank liposuction. On postoperative day 14, the woman presented with a deep wound infection, then 1 week later with MRSA superinfection. Since then, two surgical debridements and specific intravenous antibiotics have been necessary for a cure and to avoid septicemic complications. Complete wound closure was achieved only after 3 months of therapy, but a massive retractile and painful scar remained.

**Conclusion** Concomitant risk factors for wound infections (obesity, smoking, flap confectioning) determined a rare but potentially fatal wound complication after body-contouring abdominoplasty. This complication was presented to alert plastic and general surgeons to such postoperative infections and to the possibility of a non-conservative approach.

**Keywords** Aesthetic abdominoplasty · Complications · Infections · Massive weight loss · MRSA · Smoking

In the past, the large and indiscriminate use of intravenous antibiotics resulted in strains of methicillin-resistant *Staphylococcus aureus* (MRSA) characterized by high resistances to common antibiotics and increased mortality rates [1, 2]. The prevalence of such bacteria is high in intensive care and burn units, where patients are immunosuppressed, and antibiotics are largely used [3, 4], but rare in cosmetic surgery, where good clinical conditions exist, and antibiotics are limited to perioperative prophylaxis. However, in cosmetic surgery, obesity and smoking are two well-known risk factors for wound infections. In the past few years, the increased number of bariatric procedures have led to a concomitant increase in postobese patients requiring body contouring. We report the case of an ex-smoker who underwent abdominoplasty after massive weight loss and experienced the complications of a severe deep wound infection and a MRSA superinfection.

### Case Report

A 58-year-old woman presented after massive weight loss with a large amount of skin and fat excess on the abdomen and flanks. She had undergone a laparoscopic Swedish adjustable gastric banding 16 months earlier that decreased her body mass index (BMI) from 43 to 30.7. She reported a smoking history of 20 cigarettes a day for 38 years (38 pack years), but had stopped for the preceding 10 months.

Preoperative management consisted of common prophylaxis for deep venous thrombosis (elastic stockings and

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62 low-molecular-weight heparin) and for infections  
 63 (cefuroxime 1.5 g administered intravenously [IV] before  
 64 surgery and during postoperative day 1). Flank liposuction  
 65 removed 2,000 ml of fat and perfusion fluid, and abdomi-  
 66 noplasty resected 2,100 g of tissues. To preserve the local  
 67 blood flow, we limited the flap undermining laterally and  
 68 superiorly. The patient was discharged home on postopera-  
 69 tive day 2 without symptoms or signs of infection.  
 70 Outpatient follow-up visits were scheduled for postopera-  
 71 tive days 7, 14, and 30, then at 6 months.

72 The patient presented to the outpatient clinic 2 weeks  
 73 later with fever (38°C). The physical examination showed  
 74 local signs of inflammation along with two necrotic areas:  
 75 one 2 cm below and on the left side of the umbilicus and  
 76 another on the surgical wound (Fig. 1).

77 We immediately started an empiric antibiotic therapy  
 78 (cefuroxime 1.5 g IV plus gentamicin 1 g IV) and per-  
 79 formed a surgical revision. At the wound opening, 100 ml  
 80 of fluid was drained and sent for cultures. We debrided  
 81 both necrotic areas and placed an abdominal drain for 24 h.  
 82 Based on the antibiogram (*Staphylococcus epidermidis*),  
 83 the cefuroxime was maintained for a total of 3 days. The  
 84 patient was discharged home 3 days later in good general  
 85 and local condition without antibiotics. Serial wound  
 86 medications were prescribed, and a postoperative visit after  
 87 7 days was planned.

88 The patient came back to the hospital 5 days later with  
 89 fever (38.8°C) and tiredness. She presented a dehiscence of  
 90 the wound, pus discharge, and skin necrosis in the same  
 91 previous areas. We performed an urgent surgical debride-  
 92 ment and irrigated tissues with iodine-povidone and  
 93 antibiotics (gentamicin). Iodine-povidone gauzes were left  
 94 *in situ* under the abdominal flap, and the wound was left  
 95 open for postoperative drainage and serial medications.



**Fig. 1** Patient's presentation on postoperative day 14. Note the local signs of inflammation and two necrotic areas: the first 2 cm below the umbilicus and the second along the surgical wound



**Fig. 2** Patient's presentation at postoperative month 3 after three surgical debridements

96 The second antibiogram indicated a MRSA infection,  
 97 and vancomycin (1 g IV twice daily) was started. One  
 98 additional surgical debridement was subsequently per-  
 99 formed 3 days later. After 5 days, the patient was  
 100 discharged home in good general and local condition, and  
 101 serial medications were continued in an outpatient setting.  
 102 After 3 months, the abdominal wound was completely  
 103 closed, but a painful and retractive scar persisted (Fig. 2).  
 104 For this reason, a surgical revision of the scar was planned.

## Discussion 105

106 Abdominoplasty is a procedure used to remove excess skin  
 107 and fat from the abdomen and to tighten abdominal wall  
 108 muscles. Although it is one of the most popular operations  
 109 in plastic surgery, postoperative local complications are  
 110 present, endangering the aesthetic outcome and patient  
 111 satisfaction [5]. Among these complications, wound  
 112 infection is one of the most common, occurring in 2% to  
 113 5% of cases [5, 7], and numerous risk factors have been  
 114 found.

115 The effects of cigarette smoking on wound healing were  
 116 studied for the first time by Mosely and Finseth [8, 9] in  
 117 1977. These researchers confirmed a role of cigarettes in  
 118 the cutaneous processes of healing and repair. Since then,  
 119 numerous studies have shown that smokers have an  
 120 increased incidence of flap necrosis after face-lifting [10],  
 121 wound dehiscence in reduction mammoplasties [11], and  
 122 worse aesthetic wounds in abdominoplasties [12, 13]. All  
 123 the principal components of tobacco (nicotine, nitric oxide,  
 124 and carbon monoxide) seem responsible for this phenom-  
 125 enon [14]. In fact, blood flow is supplied to the distal  
 126 portion of the flap through the dermal-subcutaneous  
 127 plexus. Cutaneous vascular beds have the highest

128 sympathetic innervations and the least self-regulatory  
129 control. For this reason, they are particularly exposed to the  
130 vasoconstrictive effects of cigarette smoking (mediated by  
131 the sympathetic innervations through alpha receptors)  
132 [15, 16].

133 Obesity is another important factor that affects the  
134 occurrence of wound infections. In 1999, a significant  
135 difference for infection occurrences was found between  
136 obese and nonobese patients (80% vs 32%) [17]. Similar  
137 results were found in a study of Lahiri et al. [18], which  
138 found a trend of association between high and low amounts  
139 of body fat, as measured using bioelectrical impedance  
140 analysis: fat mass more than 35% (45.2%) versus fat mass  
141 less than 35% (34.8%).

142 Obesity also contributes directly to an immunosuppres-  
143 sion status and increases the incidence of concomitant  
144 diseases (i.e., diabetes) [6, 7], and this status persists even  
145 after massive weight loss [19]. Although patients seeking  
146 cosmetic surgery generally are in good clinical condition  
147 and rarely face MRSA postoperative infections, we think  
148 that, in the reported case, the heavy flap undermining  
149 together with the large liposuction aspirate, the postobesity  
150 status, and the history of heavy cigarette smoking could  
151 have created a particular predisposing status for the wound  
152 infection that also facilitated the MRSA in overcoming  
153 local defenses. The peculiar destructive effect of MRSA  
154 manifested with the pus, necrosis, and consequent  
155 destruction of the abdominal flap. Multiple surgical  
156 debridements with intravenous vancomycin were necessary  
157 to arrest the process.

## 158 Conclusion

159 This unusual case shows that concomitant risk factors for  
160 wound infections (obesity, history of smoking, large flank  
161 liposuction, and flap resection) may expose the patient to a  
162 rare and severe wound complication after body-contouring  
163 abdominoplasty. The particular etiologic agent required  
164 serial surgical debridements and high doses of intravenous  
165 antibiotics. We present this case to alert plastic and general  
166 surgeons to the possibility of such postoperative infections.

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