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## Short Communication

# Liposuction for autologous adipose-derived regenerative cells: Preliminary results of donor-site complications in male stress urinary incontinence<sup>☆</sup>

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## ABSTRACT

**Objectives:** Liposuction is now applied to harvest autologous adipose-derived regenerative cells in the regenerative medicine. Although liposuction is highly safe for females who generally have larger fat deposits, liposuction has some potential risks for donor-site complications in the case of aged male patients. The purpose of our study was to review the complications of liposuction of the aged male patients who have undergone cell therapy for stress urinary incontinence.

**Methods:** Sixteen male patients (mean age, 74 years old) with persistent stress urinary incontinence were included in this study. Approximately 250 mL of adipose tissue was harvested using a syringe attached to the cannula. Postoperative complications were

<sup>☆</sup> This clinical trial was registered in the University Hospital Medical Information Network Clinical Trials Registry (UMIN000006116).

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recorded and graded according to the Common Terminology Criteria for Adverse Events (CTCAE), version 4.0.

*Results:* Average liposuction time was 57.4 min. No major complications were observed. However, there were some minor complications: bruising, numbness, contour irregularities, firmness, and scarring. These complications were CTCAE Grade 1 in all cases. The complications, except for the scarring, became unnoticeable within 6 months in all cases.

*Conclusion:* Liposuction takes time and has some minor donor-site complications for stem cell therapy in aged male stress urinary incontinence patients.

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## Introduction

Mesenchymal stem cells are abundant in adipose tissue, which are called adipose-derived regenerative cells (ADRCs), and can be easily harvested by liposuction. Most liposuction patients are women, usually from their 20s–50s.<sup>1</sup> Generally, liposuction procedures are safe and their complications are rare.<sup>2,3</sup> However, liposuction from male patients suffering from stress urinary incontinence (SUI) is unique: smaller volume of fat deposit, more fibrous nature of fat and lack of skin elasticity.<sup>4–6</sup> We previously reported the favorable outcomes of regenerative treatment of male SUI by ADRCs from liposuction.<sup>7</sup> In this article, we reviewed donor-site complications from liposuction in 16 aged male SUI patients.

## Methods

Sixteen patients were treated and followed-up for more than 6 months. The average age was 74 (range 68–85) years old. The average body mass index (BMI) was 24.9 (range 20.7–27.9). The thickness of abdominal subcutaneous fat at the umbilical level was 10.3–29.1 mm, average 18.2 mm on magnetic resonance imaging.

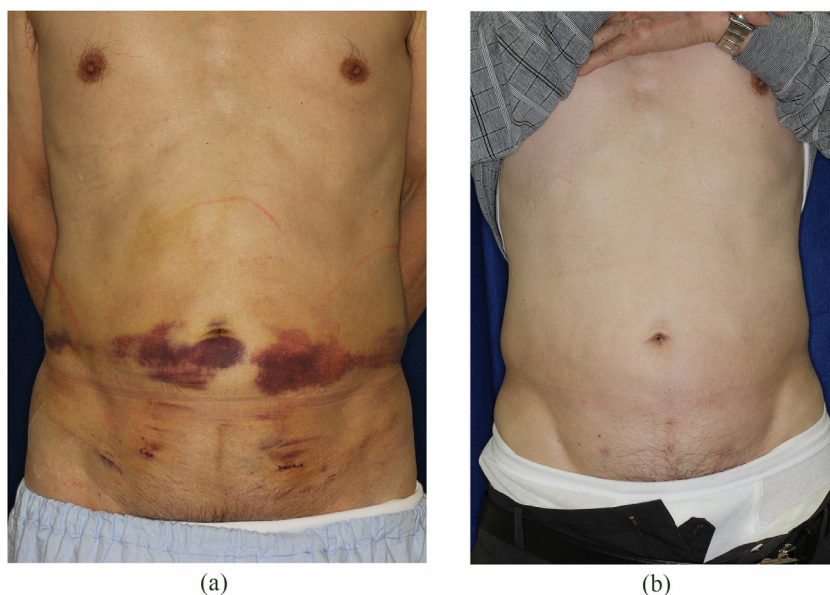
We chose the abdomen for donor site because of larger volume of fat deposit and safety of supine position. Two 3-mm incisions were made within the bathing suit line. The subcutaneous adipose tissue was collected with a physiological solution containing adrenaline without lidocaine. Approximately 500 mL of Ringer's lactate solution containing 0.5 mg of epinephrine was first infused through the incisions gradually in different directions, first into deeper layers of fat and then into the intermediate layers. If enough amounts of fat were not aspirated, some amounts of fluid were reintroduced after partial aspiration. Then a cannula (3 mm, multi-perforated holes blunt tip) was inserted through the incisions and the adipose tissue was suctioned out of the body using a syringe attached to the cannula. Deeper layers of fat were aspirated first followed by the intermediate layers. Care was exercised to avoid excessive aspiration from any given area to avoid hematoma.

Patients stayed in bed on the operative day. Vital signs were monitored in all cases. Postoperative antibiotics were taken for three days. Tight abdominal compression was performed for the first 24 h postoperatively. We scheduled post-op visits at one week, one month, 3–4 months and 6–8 months. Postoperative complications were recorded. All adverse events were graded according to the Common Terminology Criteria for Adverse Events (CTCAE), version 4.0.

**Table 1**  
Complications.

Type of complications	(N = 16) No. of patients
Bruising	16
Numbness	10
Contour irregularities	6
Firmness	6
Hypertrophic scarring	2

\*All complications ranked CTCAE Grade 1.



**Figure 1.** Bruising. A: Bruising on postoperative day 2 (read macula) around the umbilicus. B: Minor complications including bruising disappear within 6 months. (For interpretation of the references to color in this figure, the reader is referred to the web version of this article.)

## Results

Liposuction was performed in the abdomen without events, and approximately 250 mL of adipose tissue was harvested in all cases. The mean time of liposuction was 57.4 (range 28–88) min. Blood tests revealed a slight decrease in Hb on the first postoperative day.

No serious complications such as bacterial infection or pulmonary embolism were observed after liposuctions. However, there were some minor complications; which were CTCAE Grade 1 in all cases (Table 1). Bruising was common in all cases after liposuction (Figure 1). In 5 patients, mild subcutaneous hemorrhage at the abdomen was observed. All bruising disappeared in less than a few weeks. In 10 patients, numbness became noticeable within one week after surgery and subsided in less than 6 months. In 6 cases, contour irregularities were observed within a few weeks after surgery and became most pronounced several weeks after surgery. All irregularities became unnoticeable within 6 months. Six patients complained of some firmness, which also diminished within six months. There was a visible red scar in one patient and a hypertrophic scar in another patient six months after surgery.

## Discussion

Average liposuction time of 59 min seems lengthy to suction 250 ml of fat. Possible reasons that explain this finding are as follows; first, subcutaneous adipose tissue volume is lower in males than in females.<sup>4</sup> Second, in males, there is a need for increased exertion on the part of the surgeon due to the presence of a great number of vertical septi and the more fibrous nature of the fat.<sup>5,6</sup>

There were some minor complications noted in literature: bruising, firmness, numbness, contour irregularities, and skin necrosis.<sup>2,3</sup> The incidence of bruising was higher than previous reports.<sup>2</sup> Additionally, blood tests revealed a slight decrease in Hb on the first postoperative day. Possible reasons that explain these findings are as follows; less skin elasticity of older people as well as long liposuction time.<sup>1,5</sup>

The limitations of this study include a relatively small sample size ( $n=16$ ).

In conclusion, liposuction has some minor donor-site complications for stem cell therapy in aged male stress urinary incontinence patients.

## Disclosure of interest

None of the authors has a financial interest in any of the products, devices, or drugs.

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