

## Original Article

# A simple method of injecting tumescent fluid for liposuction

Arindam Sarkar, Sasanka Sekhar Chatterjee

Department of Plastic Surgery, Institute of Post Graduate Medical Education and Research, Kolkata, India

**Address for correspondence:** Dr. Arindam Sarkar, 2R, Garcha First Lane, Kolkata - 700 019, India. E-mail: doctor.asarkar@gmail.com

### ABSTRACT

Injection of tumescent fluid is essential to obtain a painless and relatively bloodless liposuction. There are many methods of injecting the tumescent fluid like power pumps, syringes and pressure cuffs. Our method consists of applying air pressure within the plastic transfusion fluid bottle by pricking with a wide bore needle and connecting it to a sphygmomanometer balloon pump. By inflation of the balloon pump and thus increasing pressure inside the plastic bottle, the rate and volume of infusion can be controlled. By applying the cuff outside the bottle the visibility inside is impaired and the bottle gets collapsed preventing a continued pressure and thereby impairing both the quantity as well as the rate of infusion. Power pumps are expensive. This method is inexpensive, infused volume of fluid being visible and the rate of infusion controllable.

### KEY WORDS

Tumescent rate; tumescent technique; tumescent fluid

### INTRODUCTION

Tumescence is essential for liposuction. It serves four purposes:<sup>[1]</sup>

1. Reduces bleeding due to adrenaline.
2. Induces analgesia by lignocaine.
3. Nullifies the acidic effect of lignocaine by adding sodium bicarbonate.
4. Makes the tissue turgid to ease suction of fat.

While injecting tumescent fluid in tissue, it needs to be injected with pressure to ensure even and prompt distribution within the subcutaneous tissue. Usually, the fluid bottle is placed within a sphygmomanometer

cuff and the pressure is raised to inject fluid. This has a disadvantage: The amount of fluid injected is not visible as the plastic bottle collapses due to pressure. While the amount of injection is predetermined for liposuction, usually the fractions consisting of <1000 L cannot be controlled due to lack of visualization.

A simple mechanism has been devised to mitigate this problem by connecting a latex rubber tube to the bottom of the bottle by a needle and the other end being connected to a balloon pump of a sphygmomanometer cuff. Pumping the balloon introduces air and raises pressure in the bottle and the amount of fluid injected is clearly visualized.

### MATERIALS AND METHODS

Precautions should be taken prior to adoption of this method. Since our method consisted of introduction of air from the outside in a closed system, we checked the efficiency of sterilization system of the operation theatre (OT). This included:

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1. Post-fumigation air colony count in respective OT by the sedimentation plate method.<sup>[2]</sup>
2. Both aerobic and anerobic culture of swabs taken from a. Table b. Wall c. Floor d. Light e. A/C duct f. Anesthesia machine.
3. Fungal culture from OT air sample.

The bacterial colony count never exceeded three, acceptable limit being < 10 CFU per plate and swabs were negative for both aerobic and anerobic as well as fungal culture.

The tumescent fluid used consisted of 20 ml of 2% lignocaine, 1 ampoule of adrenaline in 1 L of Ringer lactate. We do not use bicarbonate. For liposuction at multiple sites, e.g., abdomen, thighs, arm, we use intravenous anesthesia or general anesthesia as decided by our anesthesiologist. Since July 2010, tumescent fluid was injected in all our cases (22) of liposuction by applying pressure within the fluid bottle by the balloon pump of a sphygmomanometer cuff. This was connected by a latex rubber tube to the bottom of the bottle [Figure 1]. These articles were ETO sterilized. The needle is pricked at the bottom of the plastic bottle after inverting it completely. As the sphygmomanometer pumps in air bottle becomes inflated, and the fluid is injected at a desired rate (an average of 100 ml/min) which can be varied by varying the pump pressure. There was no difference when infusion bags [Figure 2] were used instead of usual plastic bottles, although the latter were commonly used. Pressure required to inflate the infusion bags was more but even with less than full inflation, the efficiency of infusion could be maintained. The volume was regulated as desired as everything was clearly visible inside the plastic bottle. There was no need for terminal squeezing of the bottle to get rid of even the last few milliliters of fluid by this method.

## RESULTS

So far we had applied this method in 22 patients and had no complications. Our previous method consisted of placing the fluid bottle within a cuff so that the pressure is applied on the bottle [Figure 3]. It was difficult to titrate the amount that got injected because the content was not visible. When fractions of a litre had to be injected, there was no way to do it and frequent pumping had to be done as the fluid within the bottle reduced in amount.

## DISCUSSION

Tumescent fluid for liposuction needs to be injected under pressure. Pressure generating devices used to

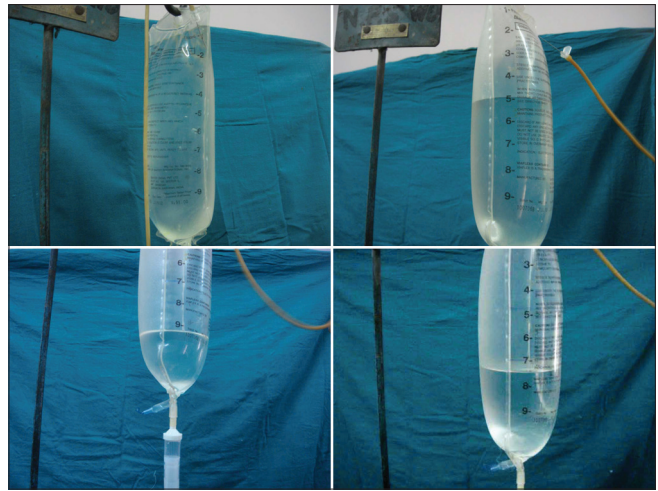


Figure 1: The described method being applied to the infusion bag. There is no air leak, and there is a clear visibility of the rate of infusion



Figure 2: Air being inflated inside the plastic bottle. The amount being injected is clearly visible and rate of infusion can be controlled



Figure 3: Pressure being applied from the outside. Nothing is visible, bottle collapses, and the rate cannot be controlled

tumesce the fat include power pumps, syringes, and pressure cuffs.<sup>[3]</sup> Syringes are convenient for specific areas such as chin, cheek, jowls, and neck requiring low

volume infusion. Infusion over large areas invariably results in fatigue.<sup>[4]</sup> Pressure cuffs surround and pressurize the tumescent solution bag. They are noiseless and inexpensive. Pressure is generated by manually pumping the bulb. The disadvantage of this technique is that the amount of fluid injected is not visible and frequently due to collapse of the bottle, speed of injection is diminished with diminishing amount of fluid in the bottle. Frequent pumping is therefore required when significant volumes are used.

It is said when a significant amount of liposuction is anticipated, a pump is more practical than other methods.<sup>[1]</sup> These use a peristaltic action to generate pressure. However, these are expensive, cumbersome and demands maintenance logistics. Our method is simple, inexpensive and has all the advantages of a pump. The flow rate can also be controlled to allow 30–200 ml of infusion/min.

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