Aesth. Plast. Surg. 29:310–312, 2005
DOI: 10.1007/s00266-005-0017-0

Aesthetic Plastic Surgery

Cutis marmorata Resemblance After Liposuction

Rogério Porto da Rocha, M.D., M.S.,[1] Elke Lusmöller Porto da Rocha, M.D., Ph.D.,[2]
Ewaldo Bolivar de Souza Pinto, M.D., Ph.D.,[1] Ângelo Sementilli, M.D.,[1] and Carla Patrícia Nakanishi, M.D.[1]

[1]São Paulo, Brasil
[2]Bielefeld-Mitte, Germany

Abstract. Liposuction is a safe method for the treatment of lipodystrophy. It gives good results in relation to body contours, especially when the superficial and deep layers of the superficial fascia are aspirated. The authors present clinical cases of female patients who underwent liposuction of the abdomen, flanks, and back in which superficial and deep liposuction was used. In the immediate postoperative period, these patients presented a skin pattern of marbled appearance, involving rosy-purplish stains intermingled with other whitish stains on the skin in the areas subjected to surgery and resembling the cutis marmorata described in the literature. Even 1 year after the operation, the stains had not receded. The literature mentions cases of cutaneous necrosis provoked by a temperature increase induced by liposuction cannulas. This trauma said to be the determining factor for local lesions of the subdermal plexus. However, no cases involving lesions of this plexus attributable to mechanical trauma from cannulas are cited. According to several authors, it is important during superficial liposuction to maintain a strip about 1 cm thick under the deep dermis for the preservation of the arterial plexus of the skin. This would avoid the formation of a skin pattern resembling cutis marmorata.

Key words: Cutis marmorata—Liposuction

Liposuction, originated by Illouz [20], was a valuable contribution to surgical techniques for the improvement of body contours. This technique evolved into superficial liposuction used to manage the superficial layer of the superficial fascia by means of simple cannulas connected to a vacuum pump. This technique was used until the advent of vibroliposuction and VASER-assisted liposuction [14–17,26–28].

To date, the literature reports no comparative studies on perfusion and skin temperature using VASER-assisted liposuction. However, there are reports describing clinical cases of necrosis in patients with delicate skin attributable to thermal ischemia of the dermis after ultrasound-assisted liposuction [9,19]. But there are no descriptions of cutaneous alterations other than necrosis, no matter what technique was applied.

Clinical Case Report

Four female patients who underwent liposuction of the abdomen, flanks, and back from July to August 1999 were studied. The ages of the patients were 25 to 38 years (average, 30.25 years), and all were of the white race. Their heights ranged from 1.70 to 1.79 m, and their weights ranged from 80 to 87 kg (average, 84 kg).

The preoperative tests included a complete hemogram with coagulogram, urea and serum creatinine, electrocardiogram, and posteroanterior chest x-ray, which gave results within the limits of normality. The surgical risk was considered to be American Society of Anesthesiology (ASA) 1 for all the patients. The patients reported no allergies, chronic diseases, or varices of the lower limbs. They received a diazepam 10 mg tablet for ingestion 12 h before the surgical procedure. General anesthesia was used, with low gas flow.

The patients were positioned in ventral, left and right lateral, and dorsal decubitus position for the

Correspondence to Rogério Porto da Rocha, M.D., M.S., Av. Ana Costa 120, Vila Mathias, 11064-003, Santos, São Paulo, Brazil; *email:* rogerio@portodarocha.com.br

superficial, and deep liposuction to be performed. Cannulas 3 to 5 mm in diameter and Robles type cannulas were used.

The surgical procedure began with the infiltration of physiologic solution (2 l) containing adrenaline 1:500000 UI into the two layers of the superficial fascia in the areas to be aspirated. After this, conventional liposuction of the deep layer was performed using 4- and 5-mm cannulas with perforated points having, respectively, one and two openings. For liposuction of the superficial layer, a cannula 3 mm in diameter was used, with a Robles-type cannula used for refinement. The average time required for the procedures was 2 h and 55 min.

All the patients remained interned for 24 h. They were able to walk around with assistance as soon as they were conscious and oriented. A compressive elastic bandage was used over the aspirated areas for a period of 30 days. The patients were medicated via the oral route using ciprofloxacin 500 mg every 12 h and paracetamol 750 mg every 8 h, both for a period of 7 days.

The patients returned for dressing changes on days 3, 5, 7, and 10 after the operation. At the first dressing change, all the patients presented irregular purplish coloration intermingled with whitish areas in a pattern that resembled marble on the skin in the regions where the operation had been performed. All the patients reported local paresthesia. The stains disappeared when finger pressure was applied. Aspirin-based therapy was then begun at a dose of 500 mg once a day for 30 days, without satisfactory results.

All the patients returned for consultations 3, 6, and 12 months after the operation. There was no mention of any local symptoms, but the skin pattern of marbled appearance remained.

Discussion

Various reports in the literature have referred to the presence of long-lasting vasomotor syndromes [3,4,6,7,13,25]. In all of these reports, coloration varying from the bluish-purpleness of cyanosis (acrocyanosis) to the rosy-purpleness of the stains appeared in "net," "tree branch," or "marbled" skin patterns of livedo reticularis, livedo racemosa, and cutis marmorata. However, there is no consensus among the authors regarding some descriptions. Both livedo reticularis and livedo racemosa characteristically involve predominance of staining on the lower limbs, but livedo reticularis may be a manifestation of lupus erythematosus [12,13], dermatomyositis, scleroderma, rheumatic fever, or rheumatoid arthritis, or it may be associated with cerebrovascular lesions (Sneddon's syndrome) [6,25]. On the other hand, livedo racemosa is described as an arterial platelet disturbance, and the stains tend to disappear at the limits with the normal skin [2].

Some authors have referred to cutis marmorata as attributable to congenital telangiectasia. This condition, typically observed in newborns during their first few days of life, is caused by instability or immaturity of the nerve supply to the capillary vessels of the cutaneous plexus, or by the presence of phlebectasia, telangiectasia, and, sporadically, cutaneous atrophy [4,7]. Others have referred to it as a skin pattern similar to marble because of its bluish-stained coloration seen on children and young adults exposed to the cold [2]. Such stains tend to disappear when the individuals is warmed up, and are considered to be physiologic.

Whatever the origin of cutis marmorata manifested on the skin, histology shows small vessels of the middle and deep levels of the dermis presenting with endothelial proliferation, hyaline degeneration, and clots of fibrin and thrombosis [2]. The literature reports cases of livedoid skin resembling cutis marmorata attributable to medication-induced cutaneous embolism [5,18], intramuscular injection of bismuth for syphilis treatment [23], cholesterol embolism [21,22], and decompression syndrome [8,11]. However, we have not found any reference to cutis marmorata after liposuction.

Ablaza et al. [1], in their study on the temperature of the superficial fascia during ultrasound-assisted liposuction, demonstrated that this temperature did not increase significantly. They reported that ischemia of the skin as a complication of liposuction could be more associated with trauma of the subdermal plexus than with thermal lesions induced by the temperature.

Nevertheless, there are no cases in the literature proving that the liposuction cannula causes trauma to the subdermal plexus. The cutaneous retraction stimulated by liposuction procedures, as reported, must have been a relevant factor in causing the skin pattern resembling cutis marmorata that we found [14–17,24,26–28]. We believe that contact of the liposuction cannula with the deep dermis over large areas may have been the cause for lesions of the arterial plexus of the skin, through mechanical action of the cannula on the dermis. Treatment with acetylsalicylic acid [2] was shown to be insufficient for complete regression of the condition after the operation, even 1 month after its use. We did not perform a biopsy of the affected area, considering that this is described as being of limited interest [13].

Conclusion

Superficial liposuction is a safe method for the treatment of lipodystrophy, giving the possibility of greater refinement of body contours. However, it becomes important to maintain a strip about 1 cm thick in the superficial layer of the superficial fascia, in contact with the deep dermis, so that the arterial plexus of the skin can be preserved, thereby avoiding

the development of a skin pattern resembling cutis marmorata.

References

1. Ablaza VJ, Gingrass MK, Perry LC, Fischer J, Maxwell GP: Tissue temperatures during ultrasound-assisted lipoplasty. *Plast Reconstr Surg* **102:**534–542, 1998
2. Arnold HL, Odon RD, James W: *Doenças da Pele de Andrews: Dermatologia Clínica Manole: São Paulo*, pp 1015–1018, 1994
3. Ascott IA, Boyle RS: Sneddon's syndrome. *Aust N Z J Med* **16:**799–802, 1986
4. Bormann G, Wohlrab J, Fischer M, Marsch WC: Cutis marmorata telangiectatica congenita: Laser doppler fluxometry evidence for a functional nervous defect. *Pediatr Dermatol* **18:**110–113, 2001
5. Bruce S, et al. Quinidine-induced photosensitive livedo reticularis-like eruption. *JAAD* **12:**332, 1985
6. Bruyn RPM, van der Veen JPW, et al. Sneddon's syndrome: Case report and literature review. *J Neurol Sci* **79:**243–253, 1987
7. Calikoglu E, Zalewska A, Onder M, Schwartz RA: Cutis marmorata telangiectatica congenita. 2005. Accessed at www.emedicine.com/derm/topic793.htm
8. Campbell ES: Decompression illness in sports divers: Part I. *Medscape Orthop Sports Med J* 1,1997. Accessed at www.scuba-doc.com/DCSPartI.html
9. Cedidi CC, Berger A: Severe abdominal wall necrosis after ultrasound-assisted liposuction. *Aesth Plast Surg* **26:**20–22, 2002
10. Champion RH: Livedo reticularis: A review. *Br J Dermatol* **77:**167, 1965
11. Conkin J: How should cutis marmorata be treated?. *Aviation Space Environ Med* **70:**939–940, 1999
12. Ehrmann S: Ein neues Gefässymptom bei Lues. *Wien Med Wochenschr* **57:**777–782, 1907
13. Francés C, Crickx B, Beylot C: Lupus érithémateux disséminé: Syndrome des antiphospholipides: Manifestations cutanéo-muqueuses du lupus érithémateux systémique. *Ann Dermatol Vener* **129:**2S102–2S105, 2002
14. Gasperoni C, Salgarello M: Rationale of subdermal superficial liposuction related to the anatomy of subcutaneous fat and the superficial fascial system. *Aesth Plast Surg* **19:**13–20, 1995
15. Gasparotti M: Aggressive liposuction. Abstracts 1st RAPS Congress Sao Paulo, Brazil, 1989
16. Gasparotti M: Superficial liposuction. Abstracts 2nd RAPS Congress Sao Paulo, Brazil, 1990
17. Gasparotti M, Lewis CM, Toledo LS: *Superficial Liposculpture: Manual of Technique*. Springer-Verlag, New York, 1993
18. Geukens J, Rabe E, Bieber T: Embolia cutis medicamentosa of the foot after sclerotherapy. *Europ J. Dermatol* Accessed at www.john-libbey-eurotext.fr/articles/ejd/9/2/132-3/
19. Gupta SC, Khiabani KT, Stephenson LL, Zamboni WA: Effect of liposuction on skin perfusion. *Plast Reconstr Surg*. **110:**1748–1751, 2002
20. Illouz YG: Une Nouvelle Technique pour les Lipodystrophies Localisées. *Rev Chir Esthet Langue Française* 19, 1980:3–10.
21. Kalter DC, et al. Livedo reticularis due to multiple cholesterol emboli. *JAAD* **13:**235, 1985
22. Kaplan RP, et al. Dermatologic features of fat embolism syndrome. *Cutis* **36:**52, 1986
23. Nicolau S: Dermatite livedoïde et gangréneuse de la consécutive aux injections intramusculaires dans la syphilis: A propos d'un cas d'embolie artérielle bismutique. *Ann Mal Vener* **20:**321–329, 1925
24. Pollack SV: Liposuction of the abdomen: The basics. *Dermatol Clin* **17:**823–834, 1999
25. Rebollo M, Val JF, Garijo F, Quintana F, Berciano J: Livedo reticularis and cerebrovascular lesions (Sneddon's syndrome): Clinical, radiological and pathological features in eight cases. *Brain* **106:**965–979, 1983
26. Souza Pinto EB: *Lipoaspiração superficial*. Revinter: Rio de Janeiro, 1998
27. Souza Pinto EB, Erazo PJ, Muniz AC, Portioli Filho AC, Caetano TA, Regazzini DV: Superficial liposuction. Annals of the "Cutting Edge II: Advances in Plastic Surgery." Manhattan Eye, Ear and Throat Hospital, New York, 1998
28. Souza Pinto EB, Fodor PB, Jewell ML, Al Shammari MA: Clinical application of VASER-assisted lipoplasty: A pilot clinical study. *Aesth Surg J* **22:**31–146, 2002