

Endermologie: Humoral Repercussions and Estrogen Interaction

L. Benelli, J.L. Berta, C. Cannistra, P. Amram, and G. Benhamou

Paris, France

Abstract. Endermologie is a motorized rhythmic folding-unfolding and suction technique of the *panniculus adiposus*. Our study shows that one 40-min Endermologie session produces no noticeable changes in biological parameters, except for plasma estradiol levels, which vary significantly, first by decreasing during the session, then by increasing afterward. Such an Endermologie/estrogen interaction can be compared to the clinical effects observed in some patients undergoing regular Endermologie treatment: return of menses in amenorrheal patients and a trophic effect on skin and subcutaneous connective tissue comparable to that observed during postmenopausal hormone replacement therapy. Understanding such an interaction with the estrogen metabolism requires additional studies and opens many paths for research on therapeutic applications before and after menopause beyond refinement of the body contour and improvement of the appearance of the *panniculus adiposus*.

Key words: Endermologie—Estradiol level changes

Endermologie (Fig. 1) is a therapeutic method developed in France by Louis Paul Guitay. This noninvasive technique mobilizes the skin and hypodermal adipose tissue by *motorized rhythmic folding-unfolding and suction*, refining the body contour and improving the appearance of the *panniculus adiposus* [3,4]. We use this technique either alone or associated with surgical techniques for body contouring, such as liposuction, liposculpture by ultrasound, and dermolipectomy.

For a better understanding of the effect of and mechanisms involved in Endermologie, we studied a large number of biological parameters tested before, during, and after Endermologie sessions.

Correspondence to C. Cannistrá, M.D., 71 rue de Rome, 75008 Paris, France

Patients and Methods

Ten obese women (mean BMI, 35.5 kg/m³; mean age, 33.7 years) underwent a 40-min Endermologie session, massaging the abdomen and thighs (Table 1). The biological constants were measured before the session and within a period ranging from 10 min to 1 h after the session.

The following biological parameters were selected and their plasma levels measured: glycemia, total cholesterol, HDL and LDL cholesterol, triglycerides, uricemia, potassium, calcium, serum iron, transaminases, SGOT, SGPT, glutamyl transpeptidase, lactic dehydrogenase, creatine phosphokinase, TSH, and estradiol.

The Endermologie sessions were performed by a trained assistant using an LPG Systems ESI apparatus.

Results

The results are summarized in Tables 2 and 3 (see also Figs. 2 and 3). Plasma estradiol was the only parameter to show any significant variation and over such a wide range.

Following this initial study, we analyzed the reasons for the disparity in results, with a decrease in blood estradiol levels in some patients and an increase in others.

In fact, this disparity is due to the fact that the blood sample was taken after the session at times varying from 10 min to 1 h, according to the patient. Consequently, we

Table 1. Characteristics of the 10 women observed

Variable	
Weight (kg)	93.9
Height (cm)	162.6
BMI (kg/cm ²)	35.5

Table 2. Summary of results

Patient	Glycemia (g/L)		Total cholesterol (g/L)		Glycerides (g/L)		Estradiol (pg/ml)	
	Before session	After session	Before	After	Before	After	Before	After
BAM...F	0.97	0.99	1.92	1.81	0.63	0.6	138.6	208.1
BON...M	0.92	0.89	1.96	1.92	1.26	2.43	386.9	392.7
DEF...M							215.9	135.9
JUP...L	0.92	0.93	1.69	1.68	0.75	0.69	131.3	154.1
KHO...R	1.05	1.07	1.81	1.8	2.06	1.38	95.7	34.9
LIN...M							353.3	171.6
MOR...P	1	0.95	1.28	1.34	0.79	0.69	162.9	187.7
MOR...F	0.91	0.93	1.48	1.44	0.49	0.45	32	25.4
PIR...A	0.97	0.95	2.25	2.19	0.84	0.75	82.1	68.6
RAB...C	0.93	0.94	1.56	1.52	0.82	0.51	90.3	81.5
Mean	1.08	0.95	1.74	1.71	0.95	0.94	168.9	146.05

Table 3. Summary of results for estradiol

	Estradiol			
	Before session	After 20 min	After 40 min (end of session)	At 1 h 40 min (1 h after end of session)
Mean (pg/ml)	119	89.3	93.3	127.4
%	100%	75%	78%	108%
Variation		-25%	-22%	+8%

performed a second study in which we measured the times blood was taken (Table 3) and observed consistent results showing an instant massive drop in blood estradiol levels during the 20-min session (mean decrease, 25%; maximum decrease, 62%). This drop, which stabilizes at the end of the session, is followed by an increase in blood estradiol 1 h after the session (mean, 8%; maximum, 30%).

Discussion

As this method involves massaging hypodermal adipose tissue with mechanically driven rollers, the hypothesis of the adipocytes breaking and releasing their contents into the bloodstream could be considered because of the negative pressure generated by suction and the positive pressure generated by pinching of the rollers. In fact, this hypothesis is unlikely, since before and after the session, kalemia and triglycerides remain virtually stable, although their concentration should logically increase with adipolysis.

Although it is usual to establish a link between the distribution of adipose tissue and hormone metabolism [1], the drop in plasma estradiol levels during the Endermologie session and its subsequent increase cannot be

easily interpreted and will require further study with new investigations. This interaction can, however, explain some of the clinical effects observed in female patients undergoing regular Endermologie treatment.

- Return of menses in some patients suffering from amenorrhea.
- Regularization of the menstrual cycle in some patients previously suffering from irregular menses.
- A trophic effect on the skin and subcutaneous connective tissue that may be compared to that obtained by postmenopausal hormone replacement therapy. The improved condition and tone of the skin have been assessed in animal studies; biopsies performed in animals (young Yucatan pigs) after 20 Endermologie sessions showed an increase in the cutaneous and subcutaneous collagen stroma, as demonstrated in Dr. Bruce Shack and co-workers' experiments [2]. This increase in the subcutaneous collagen stroma occurs in the form of strips of collagen fibers parallel to the skin (mean increase, 27%; maximum, 130%).
- Increased capacity of overweight patients to control or lower their weight. Further studies should verify the hypothesis of the capture of circulating estradiol by adipose tissue in the region stimulated by Endermologie, where the decrease in circulating estradiol may trigger an increase in estrogen secretion, which would explain the increase in plasma estradiol levels following the session.

Conclusion

The Endermologie/estrogen interaction observed here opens many paths for research on therapeutic applications before and after menopause, beyond the effect of refining the body contour and improving the appearance of the *panniculus adiposus*.

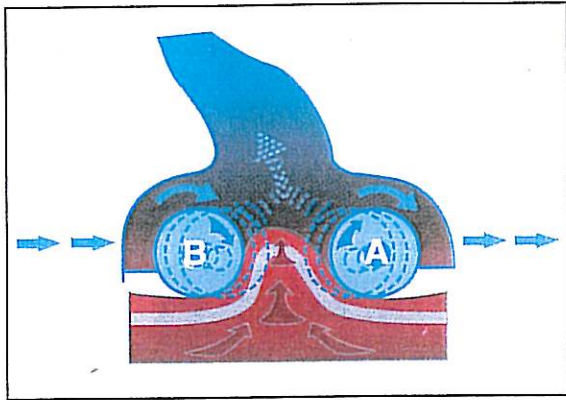


Fig. 1. Endermologie: mechanical rhythmic folding–unfolding between the motorized rollers and aspiration of cutaneous tissues and the panniculus adiposus.

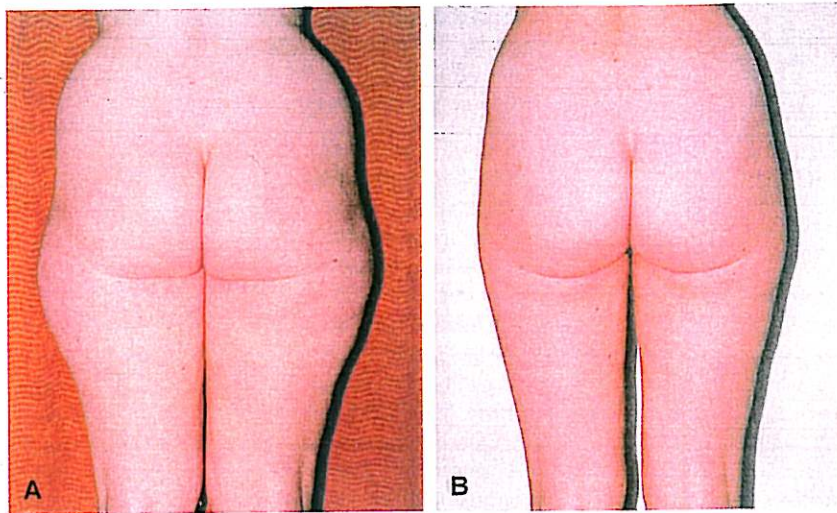


Fig. 2. A 24-year-old patient. Results 3 months after liposculpture by ultrasound on the hips, buttocks, thighs, and knees. Extraction of 3 liters of fat; operation followed by 10 weekly Endermologie sessions. Total weight loss: 8 kg.

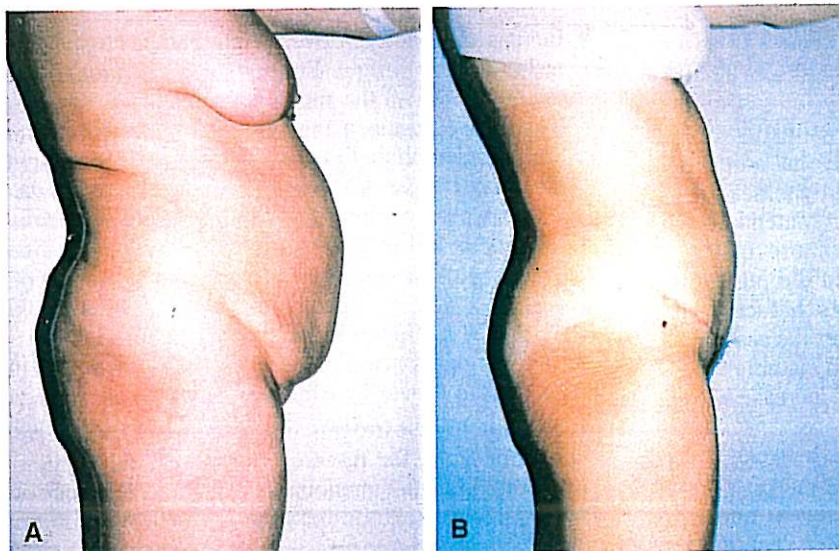


Fig. 3. A 55-year-old patient. Results 6 months after abdominal dermolipectomy and liposculpture by ultrasound on the abdomen, sides, and thighs. Extraction of 3.5 liters of fat; operation followed by 12 weekly Endermologie sessions. Total weight loss: 17 kg.

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