EFFECT OF LIPOSUCTION ON THE LEVEL OF TRIGLYCERIDES IN THE BLOOD

THESIS

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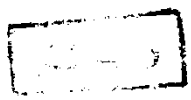

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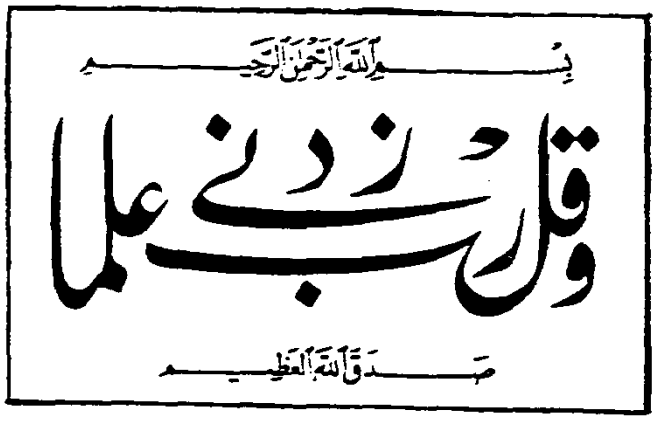

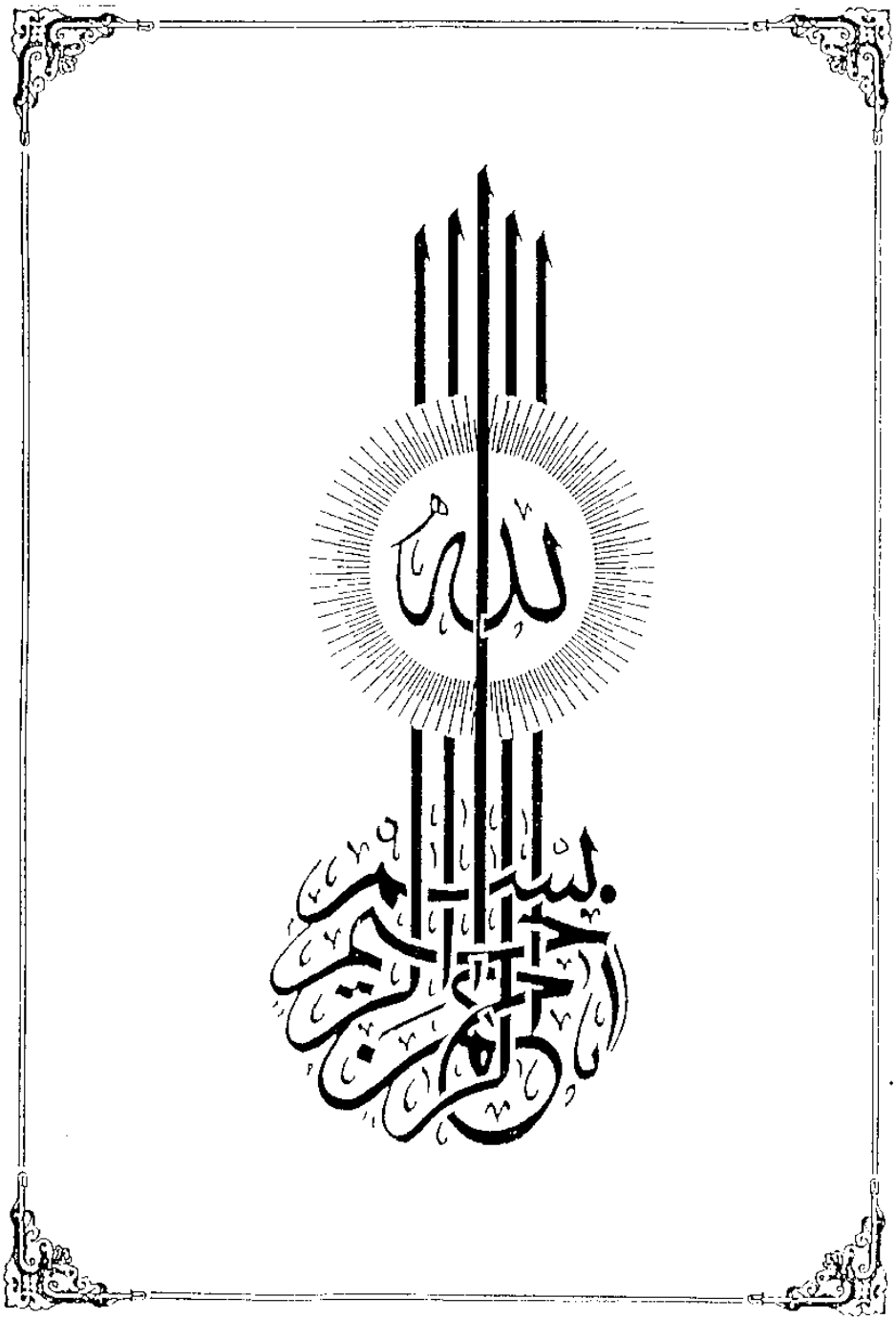

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INTRODUCTION

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In contemporary society the slim figure has become quiet popular if not an obsession. Many people are able through diet and exercise to achieve a thin and athletic appearance. This is certainly the best approach to an attractive figure. However, there are many patients where this is not enough, whether it is due to previous pregnancies and child birth, previous weight loss, or areas which are particularly resistant to reduction. Furthermore, a contouring procedure may provide many, motivation to lose additional weight. (Georgiad et al, 1987).

However, when dealing with obese patients one has to consider several special problems peculiar to these patients, which require special consideration. These patients have high incidence of associated diseases such as hypertension, diabetes mellitus or any type of hernia. They thus present a challenging problem to the surgeon as well as to the anaesthesit. Also these patients are more prone to develop excessive bleeding during procedures as dermolipectomies as the fatty apron drags on the anterior abdominal wall and veins become elongated and increased in caliber. (Schurter, 1979).

The post operative venous thrombosis is about

twice as common in the obese patients as it is in the non obese surgical patients. Grazer, in 1977, reported that about 8.8% of patients undergoing dermolipectomy do develop thrombosis of pelvic or lower extermity veins. Also it should be noted that wound healing is poor in adipose tissues and infection incidence is higher.

Therefore the development of liposuction especialy after the modification that Illouz (1977) has done to the cannulae has supplied the plastic surgeons with an easy and less time consuming procedure for conturing and getting the body rid of excess fat.

Of the advantages of liposuction we mention the considerable scar length reduction, reduction in surgical trauma reduced postoperative care, time and inconvience and very little pain with minimal risks.

Aim of work

Liposuction is not risk free and even though only two cases were reported in the literature that suffered from fat embolism following liposuction in 1986 and 1988, we find it appropriate to try to study and investigate the possibility of fat embolism following liposuction.

REVIEW OF LITERATURE

HISTORY OF LIPOSUCTION

Liposuction is a new yet a well established cosmetic surgical procedure. Since its introduction much controversery has surrounded the idea. This has originated from the initial resistance by some plastic surgeons because of the complications from the early techniques practiced in Europe. As equipments improved and techniques became more refined, liposuction has proved to be a safe and reliable means of contouring the body and face by removing the unattractive and dispropertionate fatty deposits. Whenever indicated, it is considered to be alternative to the excision of fat and has eliminated the wide often exposed scars seen with dermolipectomies.

In 1921, a French surgeon, Charls Dujarrier, attempted lipectomy on a ballerina's knees and calves by using a uterine currette. Unfortunately because of injury of the femoral artery an amputation of one leg had to be performed (qoated from Dolsky et al 1987). No further closed lipectomies were tried until Schrudde began using curettage to remove localised fatty deposits in 1960s. This technique left large cavities with many complications.

Modern liposuction surgery began when an Italian surgeon Giorgio Fischer invented an electric device that cut off fat as it was aspirated into a cannula. Although the

incidence of seroma reported by Fischer from his original work was about 30% both Fischer and Schrudde had some good results. However other surgons could not consistently reproduce them.

It was in 1976, when Kesselring published results obtained by sharp curretage by suction. His original procedure was limited to the trochanteric areas in patients with good skin tone under 35 years of age. Because of the large cavities left behind in addition to severing blood vessels, nerves and lymphatics from the overlying skin. The complications of these previous techniques were common in the form of seroma,hematoma, infection and deformities of the skin.

Illouz in 1977, was the first to realize the importance of maintaining the neurovascular and lymphatic supply to the overlying skin. His concept called for removing tunnels of fat, creating small cavities that collapsed after adipose removal, this left the important vascular structures intact (Fig. 1). His results were more predictable with minimal complications. This concept has allowed liposuction to become valuable and effetive surgical procedure and is the foundation of modern Liposuction (Dolsky et al, 1987).

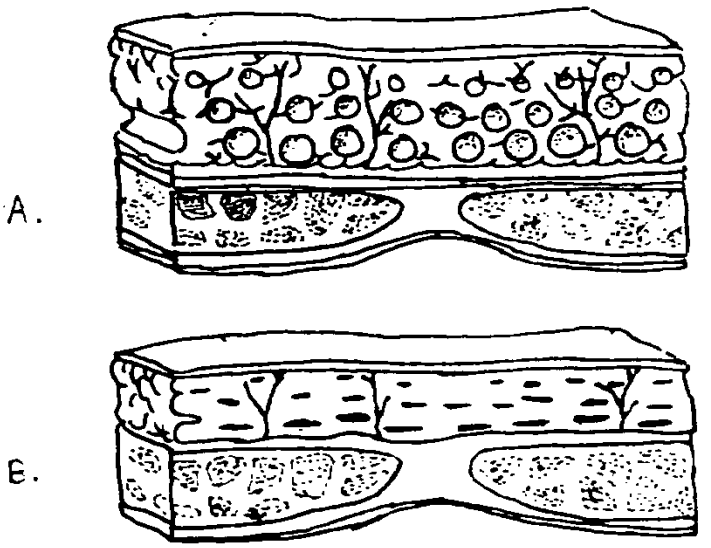

Fig (1)

A. During liposuction long cores of fat are removed, leaving a uniform coat of fat under the dermis. The vessels and nerves are left undamaged because of the shape of the cannulas which do not have sharp surfaces.

B. The elasticity of the skin, the use of pressure dressings and scar contracture in the subcutaneous space cause the tunnels to collapse and give a new contour to the involved area.

From Dolsky et al 1987.

PRINCIPLES OF LIPOSUCTION

As mentioned by Dolsky et al ,1987. the theory of liposuction is based on the fact that the number of adipocytes is fixed throughout adult life (new fat cells are formed in childhood until adolescence). Therefore, removal constitutes a permenant loss of fat and a lasting new contour.

In some people, certain areas of adiposities are more diet and exercise-resistant than other areas of the body. Thus, in thin people, even in those of ideal body weight, certain areas demonstrate a suboptimal body contour which can only be improved by liposuction. However it should be noted that people with poor skin tone and elasticity (particularly in the elderly, those with massive weight loss and abdomens of multiparous females) have the greatest chance of having wrinkled skin after liposuction. (Dolsky et al, 1987).

The original principle of Illouz (proposed in 1977) is the suction of adipose tissue after injection of hypotonic saline. The suction is done with a cannula connected to a powerful suction machine with suction approaching 1 atmpsphere pressure/cm.sq. The hypotonic saline is proposed according to Illouz, to emulsify the adipose tissue which

then can be aspirated. This technique can be applied anywhere in the body where there is fat deposits even in the face.

The hypotonic solution (according to Illouz) is composed of normal saline and distilled water, mixed in variable proportions according to the surgeon's judgement. Hyalurinidase is added in quantity according to the thickness and hardness of the adipose to be treated. Usually the formula is 100 c.c normal saline, 20 c.c distilled water and 500 or 1000 units hyalurinidase.

INJECTION OF THE SOLUTION

Two cubic centimeters of solution are injected for every 2 cm. sq. of surface area of adipose tissue and the injection should be as close as possible to the muscle. The amount of solution injected is variable according to the site 70 to 80 c.c in cases of average trochanteric lipodystrophy (one side), 30 c.c for double chin, 40 c.c for one knee or an ankle and 200 to 300 c.c for the abdomen. It is better to wait 10 minutes before starting the suction.

Fournier and Otteni in 1983 reported that, they have followed Illouz's instructions execlusively at first, but later they have found that using hypotonic saline to infiltrate the adipose tissue was unnecessary. exactly the same results could be obtained without the solution.

This "dry technique" as opposed to Illouz's "wet technique" has led to difference in opinion concerning the nature of breakdown of adipose tissue. Illouz has proposed that hypotonic solution leads to breaking down of the fat underneath the skin. While Fournier and Otteni suggested that the to and fro action of the cannula mechanicaly places pieces of fat, similar to that secured by a hollow punch biopsy, in the lumen of the cannula, wether or not it is connected to the suction machine. Specimens of fat in the cannula after it has been pushed below the skin have shown that the adipose cells are undedamaged and not emulsified . All the slides are identical from both the wet and dry technique.

The powerful centrifugal force of the suction machine breaks down the fat into pieces againest the wall of the cannula and it appears as an emulsion in the transperent tube. The suction machine is essential for the steady flow of fat pieces from the cannula to the lipousuction jar (Fournier and Otteni, 1983), they summarized the advantages of the dry techniqe over the wet technique:
Time is saved, there is less distortion of tissues than after infiltration, there is more exact evaluation of the fat removed and since hyalurindase is not used; there is no potential for sensitivity to the hyalurindase.

Dolsky et al , in 1987, reported that the injection of epinephrine significantly decreases the percentage of blood loss during liposuction. Their clinical studies have shown that dry technique was found to cause 3.4 times as much bleeding as wet technique with epinephrine containing solutions. On the average they have found that the patients heamatocrite will drop 0.46 points per 100 ml. of fat aspirated.

LIPOSUCTION INSTRUMENTS

A. Cannulas:

Illouz in 1977, first proposed the blunt bullet tip cannulas with no cutting surfaces to avoid damage to vascular structures and thus avoid the bleeding that used to occur with the first trials of liposuction. These cannulas are solid for peripheral dissection. The tip and the orifice are blunt. No 6 short for the face, neck and ankles. No 6 or 8 long straight or curved for the ankles. No 8 hollow long solid for peripheral dissection. No 10 hollow straight or curved (con_corde profile for the buttocks), long hollow for the abdomen, long reversed for the hips with a distant orifice for peripheral dissection combined with aspiration. Fig. (2). Modification of this cannula has lead to the commonly used Cobra cannula developed by Dr. Michael Elam (qoated from Dolsky et al, 1987). Fat aspiration with this cannula is very efficient requiring few strokes and less traumas their aspiration ports are right at the tip .