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an adequate number of vials, skin expansion can occur. However, it differs from a real facelift, which, to take place, must involve a movement of the tissues from bottom to top. In recent years, I have encountered various requests: patients wanting to remove cellulite, those seeking a facelift, individuals aiming to plump up their muscles, and even some desiring weight loss – all with the same product: hyaluronic acid! Unfortunately, addressing each of these categories mentioned is a mistake that will result in an unsatisfactory outcome.

2. Technical errors: They are the second big problem. The most common mistake is to implant the product too much on the surface, which exposes the problem of granulomas, and the second is represented by the introduction of the acid with the needle, which does not allow the detachment of the tissues but only the product introduction without being sure of the housing. However, the most severe technical complication, although fortunately infrequent but still present in the literature, are the emboli due to the introduction of hyaluronic acid into the gluteal arteries, which are in any case in the muscle, therefore due to an erroneous procedure that involves an intramuscular and not supramolecular as it should be.
3. The third complication arises due to the patient and the operator underestimating the procedure, leading to either a lack of postoperative care or a too-mild one. This paves the way for the most severe frequent complication, namely reactivations. It may occur that a patient, months after the treatment, suddenly experiences the hardening of the area, along with redness, occasional pain, or even feverish episodes. This can also coincide with vaccination, flu, or sun exposure. These characteristics suggest subclinical contamination during the treatment, which the body can keep under control as long as its defenses are competent, but as soon as the immune defenses are lowered, the product is "activated", or more precisely, the bacterial biofilm around the acid is activated, triggering an anti-inflammatory reaction that involves the symptoms mentioned earlier. (Fig. 3.3, 3.4, 3.5).

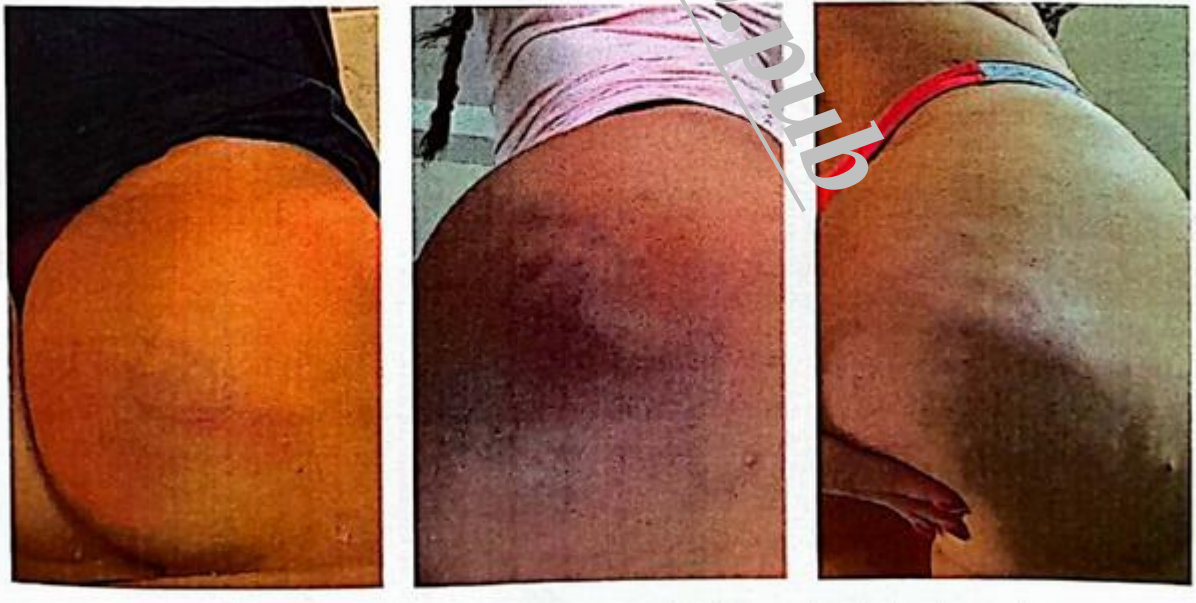


Fig. 3.3, 3.4, 3.5: Reactivation of the product after 3 months; the reactivation begins to demarcate and enlarge; the last phase, after reactivation, is the dislocation of the product.

fan technique, with retrograde and anterograde release, until the predetermined vials are exhausted. A bolus of product should be injected only at the point of maximum projection, ensuring the quantity does not exceed 10-20 ml, deposited more deeply onto the fascia of the gluteus maximus muscle to enhance projection. If it effectively detaches the fat from the underlying muscle, it allows for a modest lifting effect on the gluteus. The procedure is concluded with a vigorous massage of the treated areas to compact the tissue and achieve the maximum possible projection.

Once the first side is completed, proceed to the second side, placing a gauze soaked in disinfectant on the treated side.

A vigorous massage is crucial to "compact" the implant effectively.

After completing all the steps, close the entry holes of the cannula with 5/0 Prolene or Steri-Strip sutures if the pressure is not excessive.

Duration

One age-old question pertains to the duration of Glutefiller. Indeed, one of the criticisms is that, despite a considerable expense, the duration is not considered proportionate. In my opinion, the duration should be one of the factors guiding us toward this treatment rather than the only parameter. Let us bear in mind that it is an outpatient procedure, with almost immediate recovery, minimal complications, repeatability, modifiability, and, in any case, if not repeated, leads to "*restitutio ad integrum*".

Within my working group, in an effort to be as predictive as possible, we examined a cohort of 15 patients with MRI without contrast medium at T0, 1 month, 6 months, 9 months, and 15 months. However, the second set of data, the subject of our study, indicates that in alignment with clinical observations, there is a peak result between 1 month and 6 months post-treatment, a stable outcome up to 9 months, and then a gradual slow reabsorption. Nevertheless, the product remains present after 15 months. Therefore, we recommend adhering to the established approach of clinical observation, which suggests using half of the vials administered at T0 after one year to maintain a stable result. In other words, if 20 vials were initially used to achieve the desired outcome, after a year, to sustain the same result, 10 vials should be used, and so on for the subsequent years (Fig. 3.2).

Post-treatment

Post-treatment involves a rule more important than all the others: common sense. Therefore, in the days following the procedure, it is advisable to limit prolonged periods of sitting, avoid hot baths or saunas, and refrain from engaging in strenuous physical activities. The use of compression girdles is recommended to manage edema.

Furthermore, broad-spectrum antibiotic coverage is imperative, especially effective against skin saprophytes that often lead to infections or reactivations. Personally, I prescribe Augmentin in a double administration for 6 days, following the recommended dosage. Additionally, I recommend incorporating a natural anti-inflammatory containing bromelain, taken morning and evening for at least 20 days, and an anti-inflammatory gel for repeated massages for up to 3 months. The entire postoperative therapy aims to optimize the integration of hyaluronic acid and reduce the body's reactivity.

PROLOGUE

Let us start with the name Glutefiller. I coined and then registered this name on 06/28/2019 on the .it domain registry. I have always believed in this procedure even though those around me preferred fat transplantation, prostheses, or other off-label methods. The word derives from "gluteus", which has different translations in other languages but has its root in the Latin term "*gluteus*" (gluteus) and the word "filler". This is enough to understand that the method involves nothing more than filling the glutes with macromolecular hyaluronic acid.

INTRODUCTION TO THE GLUTEFILLER

About 15 years ago, an innovative product entered the market, enabling the reshaping of body volumes without having to resort to surgery. It seemed truly exceptional, and perhaps it was. It was a granular macromolecular hyaluronic acid produced by one of the market-leading companies called Q-Med.

The peculiarity of this acid was in the size of the particle, hence macromolecular, and in its long reabsorption, which, studied with magnetic resonance in a notable work by Heden, lasted more than a year.

The company, and this was their big mistake, proposed it for practically all body areas, providing too many indications, from the enhancement of the glutes to the enlargement of the penis (on PubMed, you can still find my work published with Prof. Sito) to post-liposuction corrections to the augmentation of male calves or pectorals. However, the biggest mistake was probably proposing it as an alternative to breast implants.

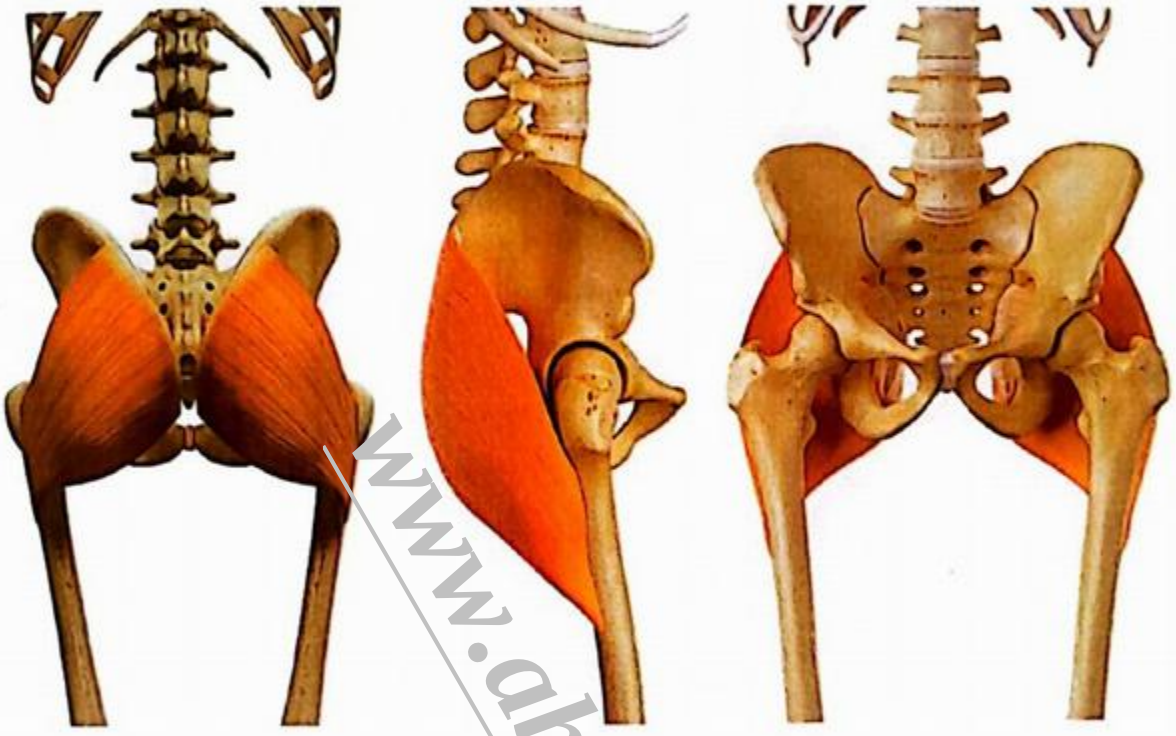
In the beginning, this option, while initially targeted toward a niche of wealthy patients, incurred a relatively high average cost due to the utilization of a substantial number of vials. Nonetheless, it had garnered a certain level of recognition and demand, particularly among those apprehensive about undergoing surgery or desiring to experience the prosthetic effect before committing to a more permanent procedure. It is crucial to emphasize that the pre-market testing was carried out meticulously, and the necessary authorizations were obtained. Therefore, we maintain absolute certainty that it cannot lead to any form of breast cancer. However, the question arises: What was the problem?

The substance known as Macrolane is radiopaque, meaning it does not cause tumors or create radiological confusion with them. The issue lies in the fact that it conceals tumors. In other words, its molecules "mask" the tumor, allowing it to manifest only when it reaches an advanced stage, making detection too late.

This was the primary reason for gradually narrowing its application field until it eventually vanished or was withdrawn from the market, compounded by a second equally alarming consequence.

Given its availability in 10 ml formulations, there were individuals – how many, we may never know – who opted to "transfer" it into 1 ml syringes for use on the face and even on the lips! This led to catastrophic outcomes, including infections resulting from the manipulation of vials, swelling due to particle size, and, regrettably, long-lasting effects in line with the enduring characteristics of the product.

A brief, sad story, one might say, but let us try to salvage what was positive: a boundary had unquestionably been breached – that of altering the body without the imperative need for surgery; it was enough not to abuse it.



2.3: Anatomy of the positioning of the gluteus maximus muscle.

- Muscle layer: At this level, muscles are present in both superficial and deep planes. In the superficial plane, the gluteus maximus and medius muscles are present. The gluteus maximus muscle (Fig. 2.3) is a quadrilateral-shaped muscle with an average thickness of approximately 6-8 cm (depending on the case). It has a vast and extended proximal insertion line, from which the fibers descend downward and obliquely, terminating at the gluteal tuberosity. Its primary functions include hip extension, external rotation, and pelvis retroversion. The gluteus maximus covers the gluteus medius and minimus.

In the same plane, the fan-shaped gluteus medius muscle is situated beneath the gluteus maximus. Its distal insertion takes place on the lateral surface of the greater trochanter, covering the gluteus minimus entirely (Fig. 2.4).

In the deep muscular plane, we find:

- Gluteus minimus muscle, triangular in shape, positioned under the gluteus medius muscle. It originates from the anterior part of the external iliac fossa and descends to the anterior margin of the greater trochanter.
- Piriformis, triangular muscle.
- Superior twin muscle.
- Obturator internus muscle.
- Inferior twin muscle.
- Obturator externus muscle.
- Quadratus femoris muscle.
- The proximal ends of the semitendinosus, semimembranosus, and biceps femoris muscles.