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Discussion: Superficial Intramuscular Gluteal Lipograft by Doppler Ultrasound: A Report of 24 Patients

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The authors mention in their work the use of a widely accepted and effective technology to determine the plane in which they perform fat infiltration within the gluteal region.[1] With the use of ultrasound, the authors identify the gluteal vessels and inject the fat in an intramuscular plane, avoiding damage to the vessels to prevent the appearance of macrofat embolism (MAFE).[1] This is because MAFE is secondary after entering large fat particles through the gluteal vessels that could be injured during fatty infiltration, especially the gluteal veins.[2]

However, the question arises: what about micro fat embolism (MIFE)?

Although the authors mention the article as a bibliographic reference about the essential differences and pathophysiology of MAFE and MIFE,[2] nothing is mentioned about MIFE, nor is MIFE given importance in this article.

It must be remembered that MAFE is a different pathology from MIFE, both from the point of view of pathophysiology, clinical presentation, diagnosis, prevention, and treatment. Although both pathologies have a common causal agent because they are produced by entering fat into the circulatory stream, the clinical pictures are totally different.[2] The only similarity in both pathologies is the presence of fat in the bloodstream. MAFE is entirely secondary to a mechanical effect, where large fat particles obstruct blood vessels and cardiac cavities when entering the bloodstream due to injury to the gluteal veins. This is produced by infiltrating fat into the intramuscular gluteal space. It is a clinical picture very similar to pulmonary thromboembolism. However, MIFE is secondary to inflammatory biochemical processes. It is understandable that using ultrasound, MAFE can be avoided by knowing the location of the large venous vessels that can be injured within the gluteal muscle during lipoinjection; however, with ultrasound, it is impossible to avoid MIFE. It must be remembered that MIFE is secondary to the entry of fat microparticles into the bloodstream through lesions of small blood vessels where the lipoinjection is being performed. The clinical picture usually begins between 48 and 72 hours after surgery. This clinical picture is secondary to free fatty acids in the bloodstream, which are products of fat degradation by serum lipase, triggering a series of biochemical events secondary to these free fatty acids. This produces a severe inflammatory response in the microcirculation, causing the classic clinical picture of MIFE, with symptoms mainly at the lung, skin, and brain levels,[2,3] and having a pulmonary clinical picture similar to acute respiratory distress syndrome. And although its mortality is not as severe as MAFE, recent studies report high mortality rates, (above 30%).[3] We do not know why some patients develop MIFE and others do not, although we know there may be predisposing factors. What is true is that the more microparticles of fat that enter the bloodstream, the greater the risk of having any eventuality, such as MIFE; therefore, the risk is more significant by infiltrating fat into highly vascularized areas such as muscle.

The two cases we had of MIFE, reported in the medical literature, were secondary to intramuscular fat infiltration.[4–6] Both occurred during our first 7 years of medical practice when we infiltrated intramuscular fat into the gluteal region. Fortunately, we have not had any cases of MAFE, but we did have these two cases of MIFE. Due to these MIFE cases, we adopted a change in behavior in our buttock fat lipoinjection technique, avoiding intramuscular injection and performing it exclusively in the subcutaneous plane. After our behavior change, avoiding injecting fat into the intramuscular space, during the last 23 years, we have not had a single case of MIFE. Therefore, it is essential to point out that although we prevent damage to gluteal major vessels and MAFE using ultrasound, we are not avoiding the risk of having MIFE secondary to lipoinjection of significant volumes in highly vascularized areas such as the gluteal muscle.

Although it is true that injecting fat intramuscularly will produce a better aesthetic result by allowing a greater amount of fatty infiltration and survival, the use of ultrasound also allows us to infiltrate fat in the deep subcutaneous plane attached to the muscular fascia without entering the muscle.[7] This also makes it easier to inject large amounts of fat with very similar aesthetic results, avoiding the risk that we have mentioned about MIFE.

Finally, it should be noted that although a patient could have more remarkable fat survival and greater volume in the buttock by injecting intramuscular fat, it is preferable to have slightly more limited volume secondary to a subcutaneous gluteal lipoinjection, but with minimal risk of suffering MIFE. In any medical procedure, safety comes

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first rather than the aesthetic result. This must be kept in mind, and it must be emphasized that although we are avoiding MAFE by using ultrasound, more studies must be carried out to know the impact of favoring the appearance of MIFE by injecting fat into the gluteal muscle.

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DISCLOSURE

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