

**GLUTEAL HARMONIZATION WITH POLYMETHYL METHACRYLATE (PMMA):
ANATOMICAL FOUNDATIONS, INDICATIONS, TECHNIQUE, AND
MANAGEMENT OF COMPLICATIONS**

**HARMONIZAÇÃO GLÚTEA COM POLIMETILMETACRILATO (PMMA):
FUNDAMENTOS ANATÔMICOS, INDICAÇÕES, TÉCNICA E MANEJO DE
COMPLICAÇÕES**

**ARMONIZACIÓN DE GLÚTEOS CON POLIMETILMETACRILATO (PMMA):
FUNDAMENTOS ANATÓMICOS, INDICACIONES, TÉCNICA Y MANEJO DE
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ABSTRACT

Buttock augmentation with polymethyl methacrylate (PMMA) is a minimally invasive alternative for volumetric augmentation and body contour correction. Despite its widespread use in Brazil, the permanent nature of the material and the potential for late complications require rigorous technical standards and careful patient selection. This article reviews the anatomical fundamentals of the gluteal region, the properties of PMMA, indication and contraindication criteria, application technique, immediate and late complications, and management strategies based on the literature. Current evidence demonstrates that the safety of the procedure fundamentally depends on the technique, the correct anatomical plane, and volumetric moderation.

Keywords: PMMA. Buttock Augmentation. Permanent Filler. Complications. Granuloma.

RESUMO

A harmonização glútea com polimetilmetacrilato (PMMA) constitui alternativa minimamente invasiva para aumento volumétrico e correção de contorno corporal. Apesar da ampla utilização no Brasil, o caráter permanente do material e o potencial de complicações tardias exigem rigor técnico e criteriosa seleção de pacientes. O presente artigo revisa fundamentos anatômicos da região glútea, propriedades do PMMA, critérios de indicação e contraindicação, técnica de aplicação, complicações imediatas e tardias e estratégias de manejo baseadas na literatura. A evidência atual demonstra que a segurança do procedimento depende fundamentalmente da técnica, do plano anatômico correto e da moderação volumétrica.

Palavras-chave: PMMA. Harmonização Glútea. Preenchedor Permanente. Complicações. Granuloma.

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RESUMEN

El aumento de glúteos con polimetilmetacrilato (PMMA) es una alternativa mínimamente invasiva para el aumento volumétrico y la corrección del contorno corporal. A pesar de su uso generalizado en Brasil, la naturaleza permanente del material y la posibilidad de complicaciones tardías requieren estándares técnicos rigurosos y una cuidadosa selección de pacientes. Este artículo revisa los fundamentos anatómicos de la región glútea, las propiedades del PMMA, los criterios de indicación y contraindicación, la técnica de aplicación, las complicaciones inmediatas y tardías, y las estrategias de manejo basadas en la literatura. La evidencia actual demuestra que la seguridad del procedimiento depende fundamentalmente de la técnica, el plano anatómico correcto y la moderación volumétrica.

Palabras clave: PMMA. Aumento de Glúteos. Relleno Permanente. Complicaciones. Granuloma.

1 INTRODUCTION

The search for minimally invasive procedures for body contouring has grown in recent decades. Among the available options, PMMA stands out for providing permanent volumetric increase through the formation of a collagen capsule around non-absorbable microspheres (1).

Although used in several areas of reconstructive medicine, its aesthetic use remains a subject of debate due to the risk of delayed inflammatory reactions and foreign body granulomas (1,2).

In the Brazilian context, there are consensual recommendations for the judicious use of PMMA in facial and body aesthetics, emphasizing appropriate technique and rigorous patient selection(5).

2 LITERATURE REVIEW

Granulomas associated with permanent fillers are described in the literature as delayed inflammatory reactions mediated by an immune response to a foreign body (1). They can appear months or years after application and often require prolonged treatment (2).

Systematic reviews indicate that true granulomas differ from early inflammatory nodules, requiring a staggered therapeutic approach, starting with intralesional corticosteroids, which may be associated with 5-fluorouracil and, in refractory cases, surgical excision (2,10).

Brazilian cohort studies on gluteal augmentation with PMMA have demonstrated long-lasting results when standardized technique and fractional volumes are applied (6). However, reports of severe complications, including extensive necrosis and chronic inflammation, reinforce that inadequate application can result in significant morbidity (7).

A recent integrative review analyzing hundreds of PMMA-related complications showed wide clinical variability, from mild reactions to sepsis and hypercalcemia associated with extensive granulomatosis (9).

The literature converges on the understanding that risk is strongly associated with:

- Excessive volume
- Incorrect anatomical plane
- Low purity product
- Patient selection failure (1,5,9)

3 ANATOMY APPLIED TO THE GLUTEAL REGION

The gluteal region has multiple relevant anatomical layers:

1. Skin
2. Subcutaneous tissue
3. Superficial fascia
4. Muscle plane (gluteus maximus, medius and minimus)
5. Deep neurovascular structures

The superior and inferior gluteal arteries, as well as the sciatic nerve, are located in deep planes. Inadvertent deep intramuscular or intravascular injections can result in serious events, including necrosis and embolization (1,7).

The deep subcutaneous plane is described as the safest for application, avoiding proximity to noble structures (5).

4 PROPERTIES OF PMMA

PMMA is composed of non-absorbable synthetic microspheres (30–50 μm) suspended in an absorbable vehicle. After carrier degradation, a fibroblastic response occurs with permanent collagen deposition (1).

Its irreversibility differentiates it from absorbable fillers. There is no enzymatic agent capable of dissolving it, making conservative planning essential (10).

5 INDICATIONS

- Mild to moderate gluteal hypotrophy
- Correction of post-liposuction depressions
- Asymmetries
- Body contouring complement

Indication for extreme volumes or disproportionate expectations should be avoided, given their permanent nature (5).

6 CONTRAINDICATIONS

Absolute:

- Active autoimmune diseases
- Local infection
- Immunosuppression
- Body dysmorphic disorder

Concerning:

- Filler reaction history
- Heavy smoking
- Unrealistic expectations

The psychological assessment implicit in the anamnesis is an essential component of safety (5).

7 APPLICATION TECHNIQUE

The technique directly influences the complication rate.

It is recommended:

- Orthostatic marking
- Blunt cannula
- Retrograde technique
- Linear deposits
- Homogeneous distribution
- Fractional application in multiple sessions

Concentrated boluses increase the risk of localized inflammation and necrosis (7,9).

High volumes in a single session are associated with a higher incidence of adverse events (9).

8 COMPLICATIONS

8.1 IMMEDIATE

- Severe pain
- Hematoma
- Exacerbated oedema
- Early infection

8.2 LATE YEARS

- Granulomas
- Palpable nodules
- Chronic inflammation
- Material migration

- Tissue necrosis
- Rare Systemic Complications (9)

Granulomas may require prolonged treatment and multiple interventions (2,10).

9 COMPLICATION MANAGEMENT

Acute inflammation:

- Systemic corticosteroid therapy
- Antibiotic when indicated

Granulomas:

- Intralesional corticosteroid
- Association with 5-fluorouracil (2,10)
- Surgery in refractory cases (2)

Prevention remains the most effective strategy, given the impossibility of enzymatic reversal (10).

10 DISCUSSION

The literature shows that PMMA can present an acceptable safety profile when used under strict technical criteria (5,6). However, extensive reviews of complications show that technical errors, excessive volumes, and application outside the appropriate plan are directly associated with serious adverse events (7,9).

The irreversibility of the material imposes increased responsibility on the professional. Unlike absorbable fillers, there is no possibility of simple correction of complications.

Therefore, gluteal harmonization with PMMA should be considered a procedure of high technical responsibility, and not a low-risk alternative.

11 CONCLUSION

Gluteal harmonization with PMMA can offer lasting and satisfactory results when performed by a trained professional, with deep anatomical knowledge, conservative technique and careful patient selection.

However, the permanent nature of the material requires prudence, detailed informed consent, and preparation for the management of complications, including late complications.

Security should always prevail over the search for volume.

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