Journal of Plastic, Reconstructive & Aesthetic Surgery (2016) 69, e174—e179

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

A staging system for gluteal foreign body reaction to injectables

Rebecca C. Novo [a], Christopher J. Salgado [a,*], Elizabeth Yim [b], Varsha Sinha [a], Harvey W. Chim [a], Paolo Romanelli [b]

[a] *Division of Plastic Surgery, Department of Surgery, University of Miami Miller School of Medicine, Miami, FL, USA*
[b] *Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, Miami, FL, USA*

Received 6 January 2016; accepted 17 May 2016

KEYWORDS
Gluteal augmentation;
Gluteal injections;
Complications;
Foreign body reaction

Summary *Background:* Esthetic augmentation of the gluteal region can lead to complications including debilitating pain, infections, wounds, and scars. To our knowledge, a general consensus of staging and treatment guidelines for managing gluteal foreign body reaction to injectables has not yet been established.
Objective: The objective of this study was to develop a reliable staging system that can be used to implement a treatment algorithm for gluteal foreign body reactions.
Methods: A retrospective review of 40 patients treated for complications of gluteal injections between September 2010 and May 2014 was performed. Patient symptoms, imaging, and photographs were used to develop a staging system of disease. Institutional review board approval was obtained from the University of Miami Miller School of Medicine. Five independent observers reviewed the patients' documented symptoms and photographs. Using our staging system, the independent observers reviewed the patient cases at two separate time intervals. Intra- and interclass correlation coefficients (ICCs) were computed to assess the reliability for each of the observers.
Results: Seven patients were classified as Stage I, fifteen as Stage IIa, nine as Stage IIb, and nine as Stage III. The mean patient age was 34 years (21—50). Analysis of the independent reviewer results revealed ICC for each rater to range from 0.96 to 0.98, demonstrating high indexes of intra-rater reliability.
Conclusions: Based on our statistical analysis, we found an excellent inter- and intra-observer reliability, indicating that the staging system is reproducible and reliable. A treatment strategy dependent on the stage can be implemented as a guideline to optimize functional and esthetic outcomes.

* Corresponding author. University of Miami Miller School of Medicine, 1120 NW 14th St, Clinical Research Building 4th Floor, Miami, FL 33136, USA. Tel.: +1 305 243 4500 (office); fax: +1 305 243 4535.
E-mail address: ChristopherSalgado@med.miami.edu (C.J. Salgado).

http://dx.doi.org/10.1016/j.bjps.2016.05.007

Introduction

The increasing popularity of gluteal enhancement procedures has led to more unlicensed, nonmedical practitioners administering injections into the gluteal region for cosmetic augmentation. Injections are often impure or unsterilized, leading to significant complications such as infection, intractable pain, and potential tissue necrosis.

In this study, we aim to correlate patient symptoms with physical findings in order to develop a novel staging system for foreign body reaction to injections of the gluteal region. Utilizing this staging system, an algorithm may be used to guide treatment to achieve optimal outcomes.

Methods

A retrospective review of 40 consecutive patients treated for complications of gluteal injections between September 2010 and May 2014 was performed. Institutional review board approval was obtained from the University of Miami Miller School of Medicine (IRB # 20140502). The chart review included documented patient symptoms, patient photographs, and computed tomography (CT) scan evaluations. The following stages were developed by the authors based on symptoms and physical findings:

Stage I

This stage includes occasional symptoms such as pain or warmth of the gluteal area with an absence of physical findings (Figure 1).

Stage IIa

This stage is characterized by frequent to constant gluteal pain or tenderness, and occasional infections demonstrated by cellulitis or abscesses. Physical findings may be absent or evident by small palpable nodules in the subcutaneous tissue (Figure 2). No chronic skin changes are evident.

Stage IIb

This stage involves frequent to constant gluteal pain or tenderness, and infections demonstrated by cellulitis or abscesses. Physical findings include redness, tenderness, palpable masses, and possible contour abnormalities (Figure 3), with the presence of chronic skin changes such as discoloration or thinning of skin.

Stage III

This stage is characterized by moderate to significant pain, with frequent infections or open wounds. Leather-like changes in skin quality, contour abnormalities, palpable tender masses, open nonhealing wounds, or spontaneous drainage of oil is observed (Figure 4).

Using the proposed staging system, the authors determined seven patients presenting with Stage I, fifteen with Stage IIa, nine with Stage IIb, and nine patients with Stage III. Five independent observers reviewed the documented symptoms and photographs of our patients. Using our staging system, the independent observers classified the patients at two separate time intervals, day 1 and 3. The intra- and interclass correlation coefficients (ICCs) were computed to assess the reliability for each observer and variability between observers. The maximum likelihood estimates of between-subject and within-subject variance were obtained through linear mixed models for calculating

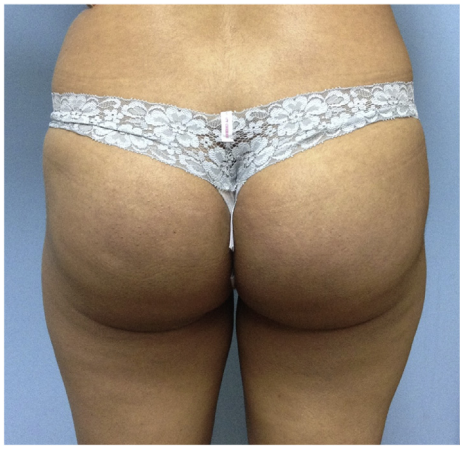

Figure 1 Gluteal foreign body reaction Stage I. A 34-year-old woman with a history of gluteal injections 2 years prior who presented for evaluation due to concerns about occasional warmth in the gluteal regions around the time of menses.

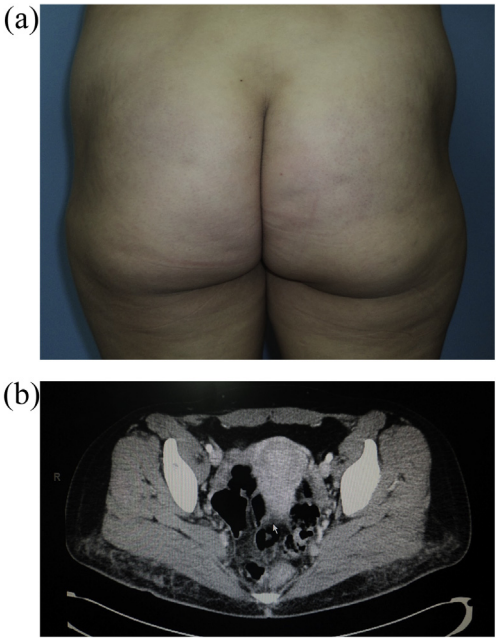

Figure 2 Gluteal foreign body reaction Stage IIa. (a) A 26-year-old woman with gluteal injections 1 $^{1}/_{2}$ years prior presented with significant pain and tenderness despite no physical findings; (b) a CT scan demonstrating foreign body in the gluteal subcutaneous tissue.