

# Gluteal Vein Anatomy: Location, Caliber, Impact of Patient Positioning, and Implications for Fat Grafting

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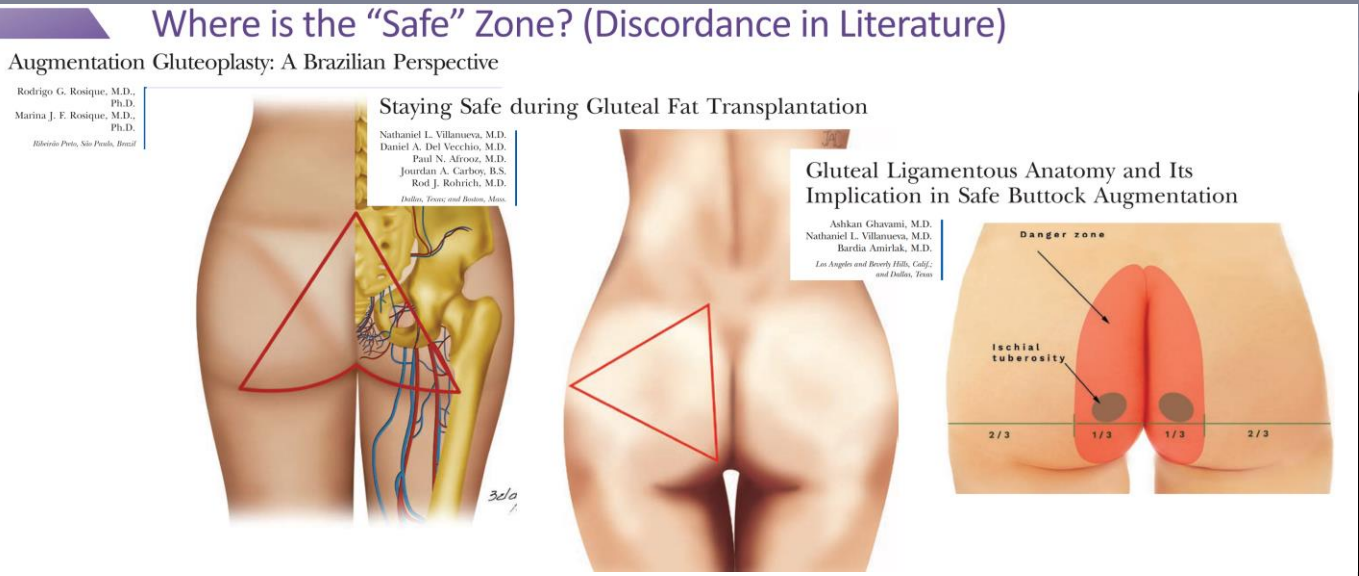
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## Introduction

Large volume fat transfer to the gluteal region has become increasingly popular due, in part, to more efficient liposuction and fat grafting techniques as well as changing aesthetic ideals. Unfortunately, catastrophic complications from fat grafting to the buttock continue to be reported, with death rates estimated to be as high as 1 in 2351. Autopsies have shown that these deaths were likely caused by gluteal vein injury during intramuscular fat graft placement and subsequent macroscopic fat embolism. Although the exact mechanism of these venous injuries has not been completely elucidated, the critical paucity of detailed anatomic studies on the location and caliber of these same gluteal veins is concerning. Moreover, there is dubious utility of cadaver studies in this setting because the caliber of the vulnerable vessels will perforce change with the necessary postural changes during live gluteal fat grafting and dynamic vessel filling.

2020 Body Procedures	Procedure Count
Abdominal (Hernia Repair)	5,366
Abdominoplasty (Tummy Tuck)	163,073
Body (Lipectomy)	1,065
Buttock Augmentation (Fat Grafting & Implants)	40,320
Excision of Excess Skin	41,343
Fat Grafting (Thigh and Other Body)	6,848
Implants (Calf)	209
Liposuction	296,601
Weight Loss (Gastric Balloon)	1,274
<b>TOTAL</b>	<b>556,100</b>

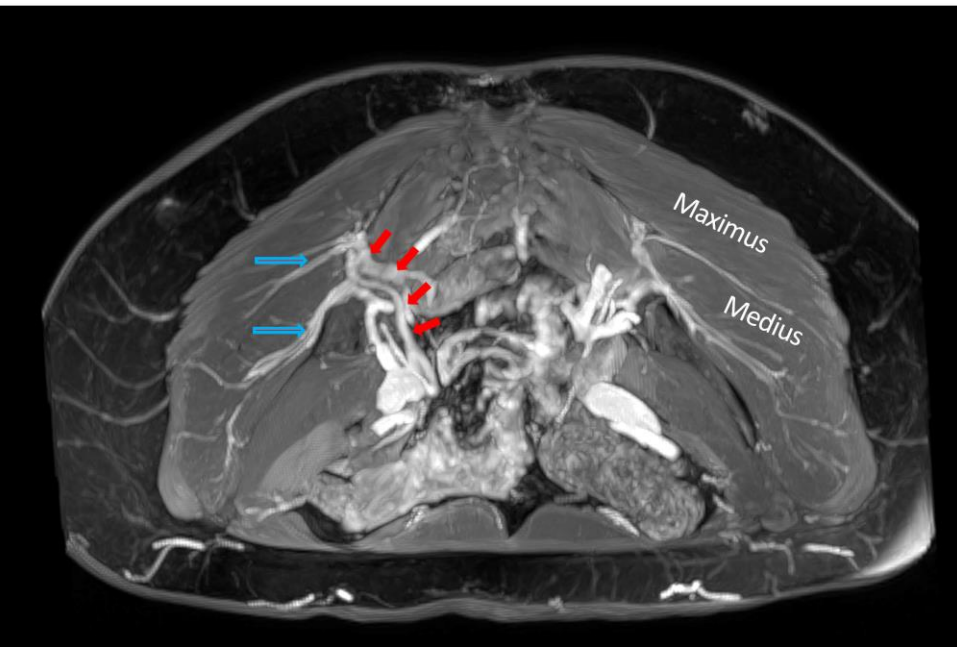


Anatomy is key to avoiding injury – the question the becomes:  
Where are the Gluteal Vessels In Vivo and How to Avoid Injury?

## Methods

- FIRST** In-vivo investigation
  - 16 hemi-buttocks
- Average age – 30 years (range 22.75 to 39.67)
- Average BMI – 24 (range 18.80 to 29.50)
- Average height – 162cm (range 154.94 to 177.80)
- MRI Venogram of the pelvis in 5 positions
- 1 contrast injection – novel use of Iron-based contrast media (Feraheme)
- all imaging obtained in a single session
  - Supine
  - Prone
  - Left and Right Lateral Decubitus
  - Jackknife – prone with bump under hips

### Results – Superior Gluteal Vein



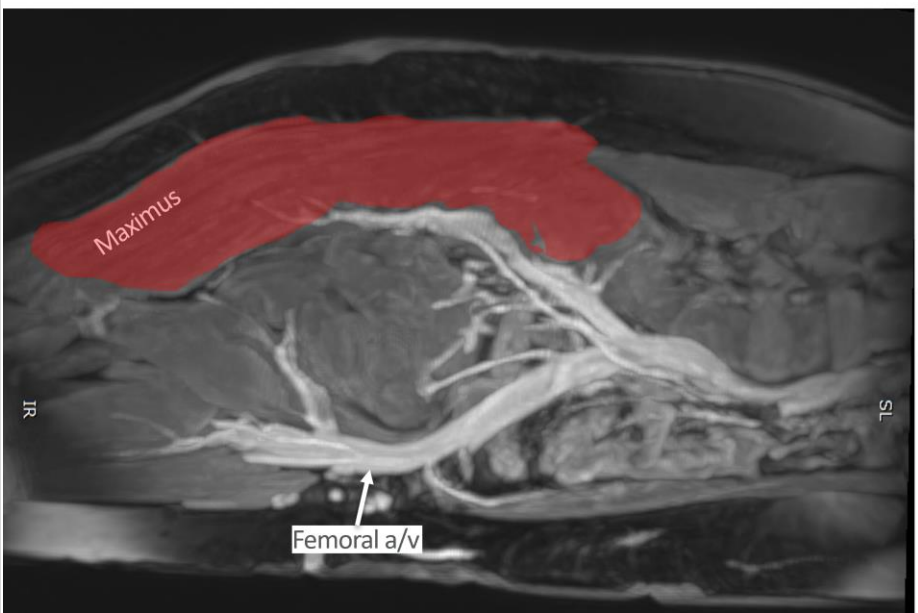
-coming out of the superior  
sciatic notch in axial plane  
-bifurcation almost  
immediately  
-branches running deep to  
gluteus maximus and medius  
-main trunk average caliber  
5.55mm (range 3.10-8.70) in  
prone position

### Results – Inferior Gluteal Vein



-coming out of the inferior  
sciatic notch in coronal plane  
-one large trunk running  
inferolaterally deep to gluteus  
maximus  
-main trunk average caliber  
5.98mm (range 2.90-8.40) in  
prone position

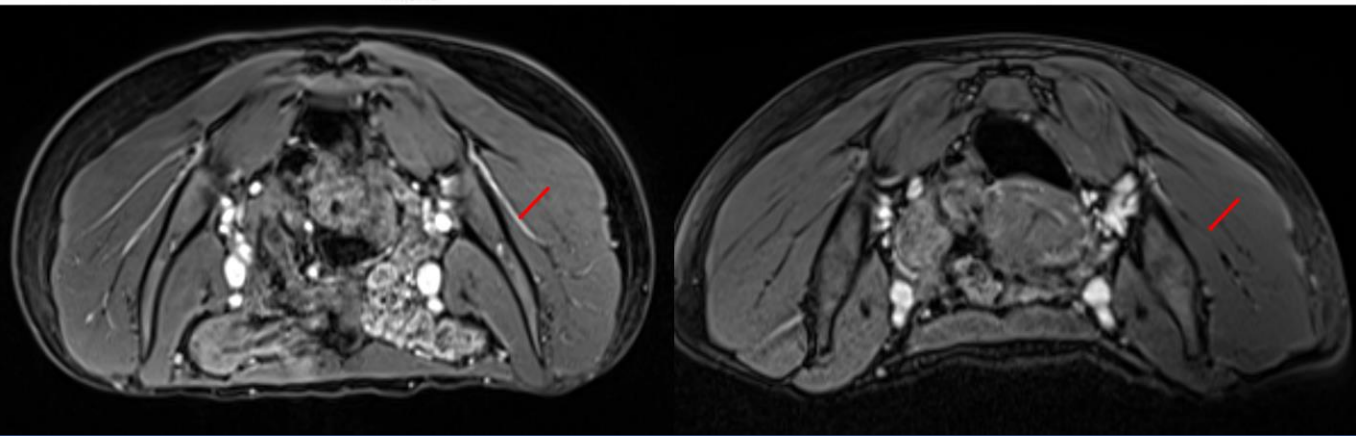
### Results – Inferior Gluteal Vein



-coming out of the inferior  
sciatic notch in coronal plane  
-one large trunk running  
inferolaterally deep to gluteus  
maximus  
-main trunk average caliber  
5.98mm (range 2.90-8.40) in  
prone position

### Results – influence of position on vessel caliber

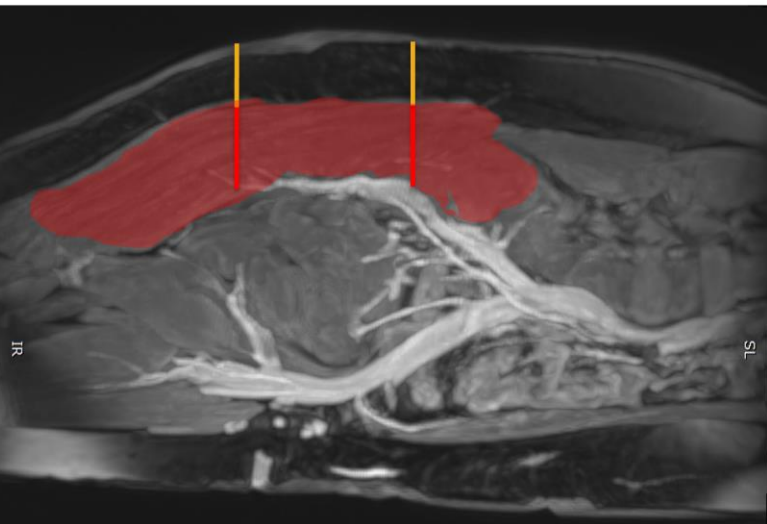
	Prone (baseline)	Decubitus (side is up)	Prone with bump under hips
Superior Gluteal Vein	100%	85% (σ=20%)	73% (σ=11%)
Inferior Gluteal Vein	100%	86% (σ=21%)	78% (σ=13%)



## Conclusions

**Conclusions:** The SGV and IGV are immediately deep to gluteus maximus approximately 6 cm deep with a caliber on the order of 6 mm in the prone position. The distribution of these vessels suggests there is no “safe zone” in the intramuscular or submuscular planes. The jackknife or lateral decubitus positions can decrease vein caliber by up to 27%, possibly reducing the risk of injury due to either traction or direct cannula impact.

- There is no safe zone
- Inferior Gluteal Vein is 6 cm deep to surface on average
- There may be a safe depth



## Thank You

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## Bibliography

This publication was selected as Editor’s Choice and is therefore available as Open Source. Full bibliography can be found in the complete publication

<https://academic.oup.com/asj/article/40/6/642/5580042>

### Body Contouring

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