AMSER Case of the Month March 2025

21-year-old male presenting one year after a skateboarding accident with a progressively enlarging right gluteal mass

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Patient Presentation

- HPI: 21-year-old male with no significant PMH, presents with a slowly growing right gluteal mass first one year after a skateboarding accident.
- Vitals: Temp: 36.8 °C, BP: 136/76, HR: 69, RR: 17, weight 118.5 kg
- Physical Exam:
  - No signs of distress
  - Large soft tissue mass approximately 30 x 40 cm along the right buttock
  - Nontender with no erythema or induration and is quite prominent
  - Normal lower extremity range of motion and strength

Labs:

- Hgb/Hematocrit: 10.1 g/dL / 20.2%
- WBC: 7.5 K/uL
- Platelets: 182 K/uL
- MCV: 79.7

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What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 4. Soft-tissue mass. Nondiagnostic initial evaluation. Presenting with spontaneous hemorrhage or suspicion of vascular mass. Next imaging study.

Procedure	Appropriateness Category	Relative Radiation Level
MRI area of interest without and with IV contrast	Usually Appropriate	0
CT area of interest without and with IV contrast	Usually Appropriate	Varies
CTA area of interest with IV contrast	May Be Appropriate	Varies
MRA area of interest with IV contrast	May Be Appropriate	0
MRI area of interest without IV contrast	May Be Appropriate (Disagreement)	0
CT area of interest with IV contrast	May Be Appropriate	Varies
CT area of interest without IV contrast	May Be Appropriate	Varies
FDG-PET/CT area of interest	May Be Appropriate	☢☢☢☢
US area of interest	Usually Not Appropriate	0

CTA = CT angiography; FDG = fluorine-18-2-fluoro-2-deoxy-D-glucose; IV = intravenous; MRA = MR angiography; US = ultrasound.

This test was ordered by physician for concern of an underlying malignancy such as a sarcoma

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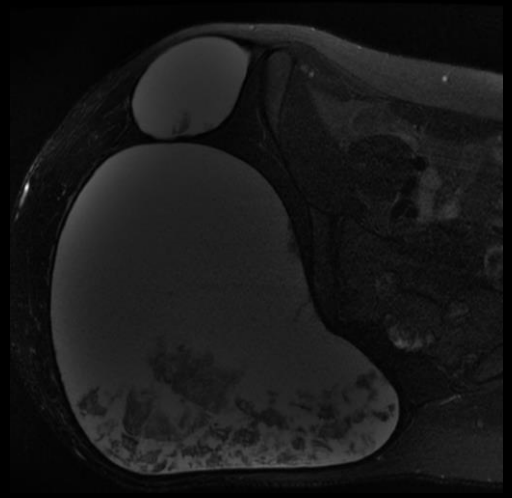
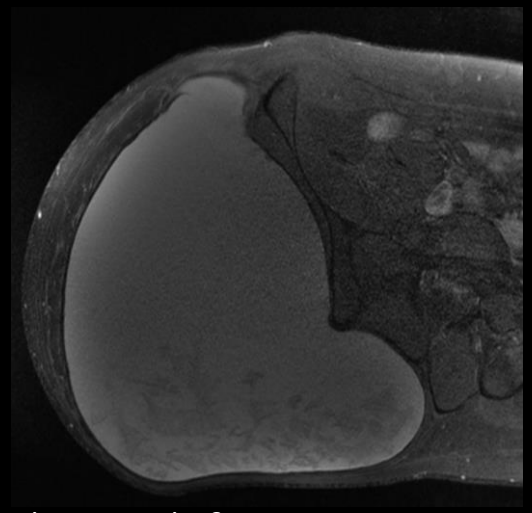
Findings (unlabeled) – Several months after accident

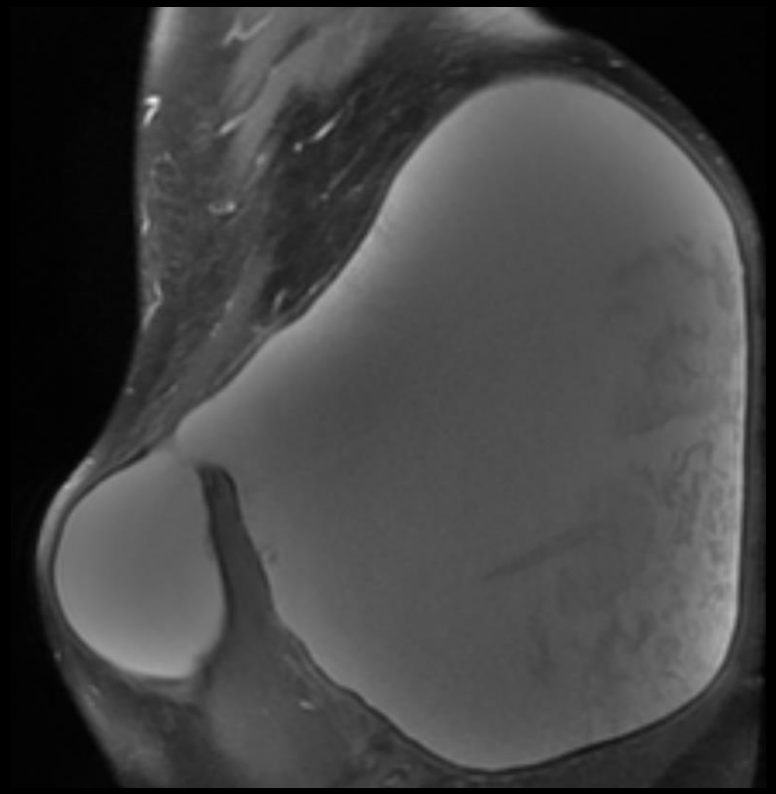


Axial T2



Axial T1 with fat sat, post-contrast

Coronal T1 with fat sat, post-contrast



Sagittal T1 with fat sat, post-contrast

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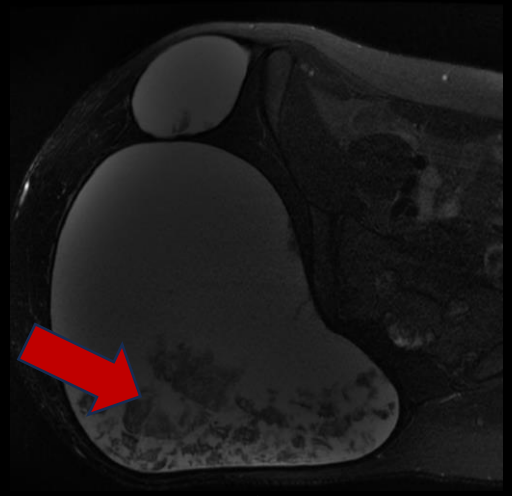
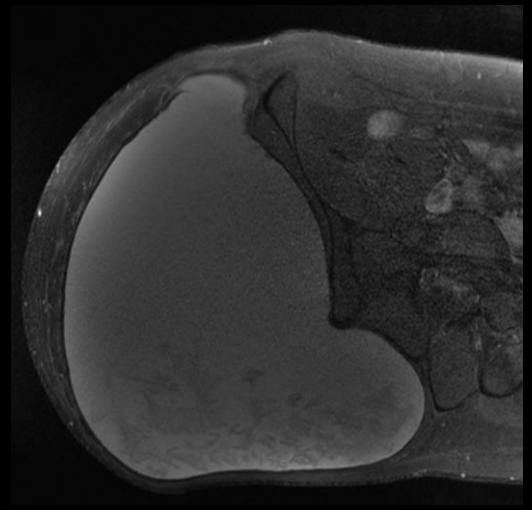
Findings (labeled)

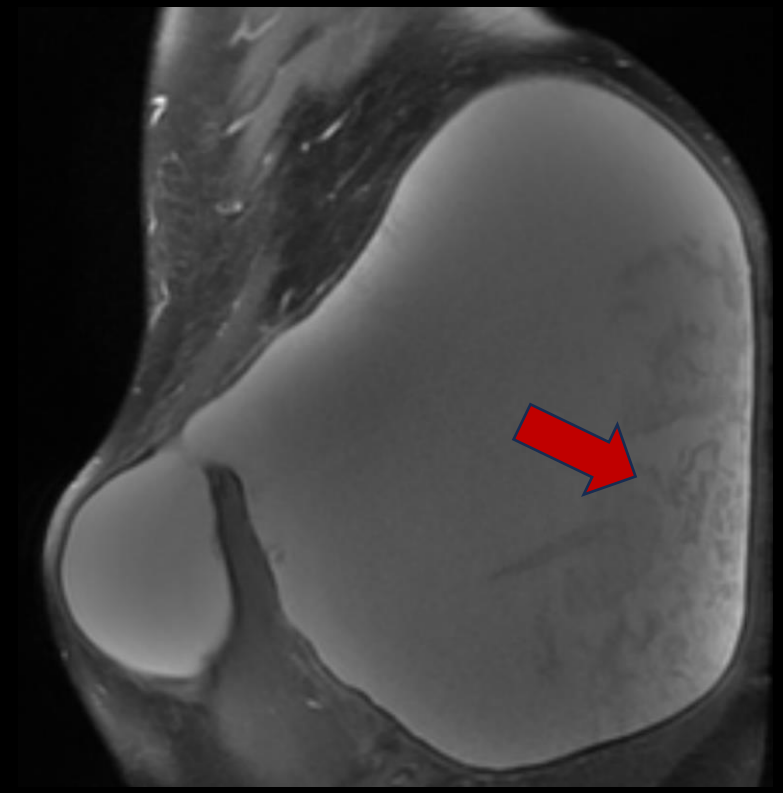


Axial T2



Axial T1 with fat sat, post-contrast

Coronal T1 with fat sat, post-contrast



Sagittal T1 with fat sat, post-contrast

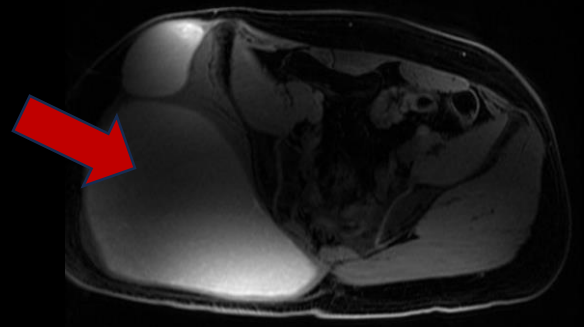
Large fluid filled contained collection with internal debris (red arrows) with no solid enhancing components encapsulated between subcutaneous tissues and fascia superficial to muscles.

Final Diagnosis:

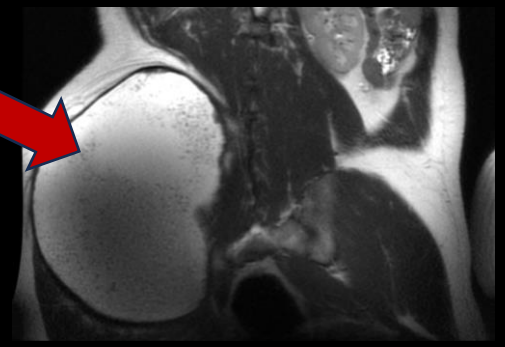
Morel-Lavallee lesion of the right gluteus

Management

- Cytological analysis of the aspirated fluid from the lesion confirmed no traces of malignancy.
- Despite an initial aspiration attempt of approximately 5 L, the patient experienced a recurrence of fluid collection (red arrows).
- Surgical resection of the right gluteal mass was performed with drain in place.
- Patient had an uncomplicated post-operative course, and drain was removed



Axial Pre-contrast T1 Hyperintense Contents



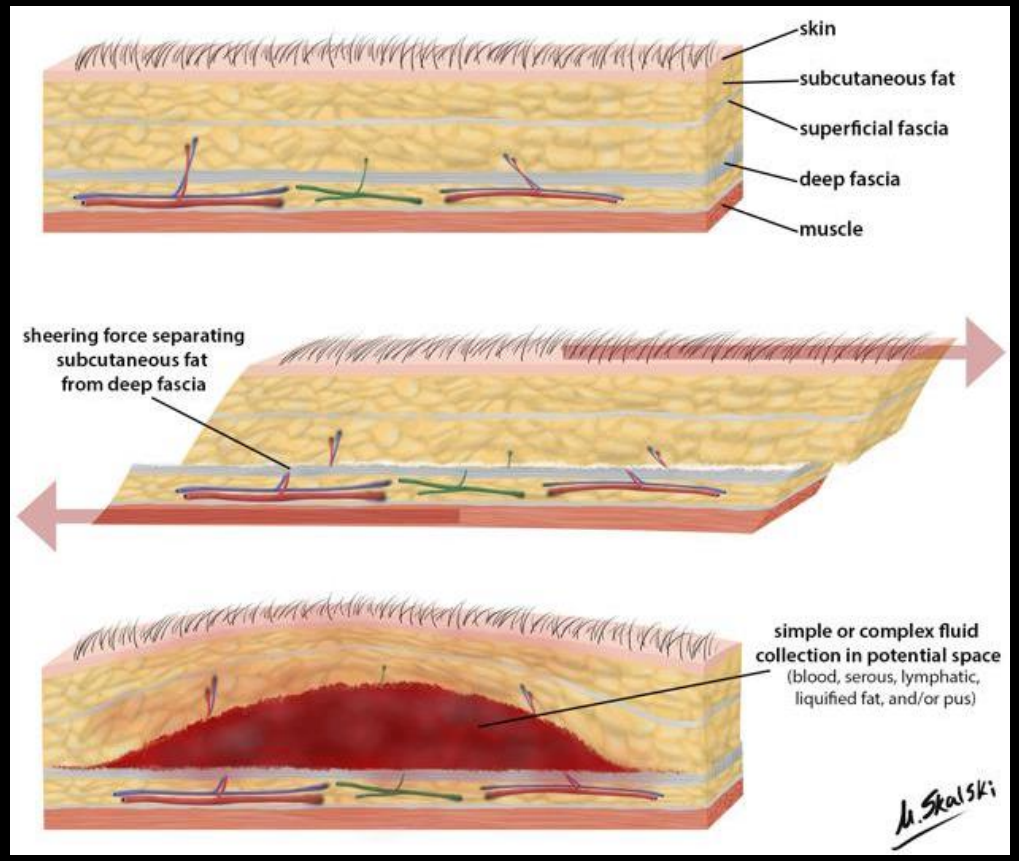
Coronal SSFSE

Sagittal Localizer Image

Repeat MRI shows fluid collection within the right gluteus muscles measuring at least 20.7 x 15 x 17 cm again without enhancement or solid component.

Morel-Lavallee Lesion

- Etiology:
  - Sheering forces from trauma causes separation of deep fascia from skin and superficial fascia, creating a cavity.[1]
  - Injury to lymphatic vessels and capillaries results in lymph and blood accumulation in the perifascial cavity.[1]
  - If untreated, local inflammation results in fibrous capsule formation filled with necrotic fatty tissue, blood products, and debris. [1]
- Clinical Presentation:
  - Increasing swelling +/- pain and tautness following trauma.[3]
  - Exam shows ecchymosis, swelling, fluctuance and skin hypermobility. [3]
  - 33% of lesions are missed at time of initial evaluation.[3]



Adapted from Gaillard et al. Radiopedia.org[2]

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Morel-Lavallee Lesion

- Differential Diagnosis: Soft tissue malignancy, bursitis, abscess, hematoma, post-traumatic muscle contusion, myositis ossificans.[3]
- Diagnosis:
  - MRI is the preferred method as it can provide insight into the injury's size, shape, content and chronicity. [4]
  - Average size: 30 x 12 cm.[4]
  - Fluid-filled space is often identifiable on T1- and T2-weighted MRI sequences. [4]
- Treatment:
  - Non-operative: compressive therapy for smaller lesions ($<50cm^3$) or percutaneous drainage with drain placement. [4]
  - Operative: open drainage and mass resection +/- debridement of dead tissue. [4]
- Complications: Recurrence, skin necrosis, pseudocyst or abscess formation. [4]

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References

1. Diviti, S., Gupta, N., Hooda, K., Sharma, K., & Lo, L. (2017). Morel-Lavallee lesions-review of pathophysiology, clinical findings, imaging findings and management. Journal of clinical and diagnostic research: JCDR, 11(4), TE01.
2. Gaillard F, Walizai T, Deng F, et al. Morel-Lavallée lesion. Reference article, Radiopaedia.org. https://doi.org/10.53347/rID-7532
3. Myrick, K. M., & Davis, S. (2018). Morel-Lavallee injury a case study. Clinical Case Reports, 6(6), 1033.
4. Scolaro, J. A., Chao, T., & Zamorano, D. P. (2016). The Morel-Lavallée lesion: diagnosis and management. JAAOS-Journal of the American Academy of Orthopaedic Surgeons, 24(10), 667-672.

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