



Worsening right hip pain

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Answer: Infected pseudoaneurysms.

Discussion

The MR images demonstrate a large, peripherally rim-enhancing infected hematoma surrounding a thrombosed pseudoaneurysm within the right gluteus maximus, as well as ovoid enhancing pseudoaneurysms within the left gluteus medius and maximus along the course of the left gluteal arteries. Hypointense non-enhancing signal within the more lateral left-sided lesion was related to thrombosis (Fig. A, B, and C).

Infected pseudoaneurysms, also known as mycotic pseudoaneurysms, are sequelae of uncontrolled infection whereby bacteria or fungi seed and destroy the arterial intima and deeper layers of the vessel. While the term “mycotic” often refers to this specific pathology interchangeably between the predominant bacterial etiology over the less common fungal type, the term’s secondary use for fungal infections may introduce a degree of confusion. As a result, the term “infected” will be used as an overarching classification for this discussion. By definition, a pseudoaneurysm is characterized by destruction of the intima such that blood leaks through but is contained by the adventitia, as opposed to a true aneurysm where there is no selective intimal compromise. *Staphylococcus* and *Streptococcus* species are the causative organisms for over 50% of diagnosed cases.

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Thirty to forty percent of cases are caused by enteric species including *Salmonella typhi* [1]; pseudoaneurysms with this etiology are at an increased risk of rupture relative to the aforementioned Gram-positive cocci. Outside of the aortoiliac trunk, where the majority of infected pseudoaneurysms form, the femoral artery is the next most common peripheral site [2]. A preponderance of cases involves a history of femoral catheterization, intravenous drug use, endocarditis, or prosthetic heart valve, narrowing the differential diagnosis considerably.

Diagnostic confirmation is accomplished by arteriography [2] and ultrasonography, as MR imaging may provide equivocal findings. For example, in our index case, there were lesions T1 isointense to muscle (Fig. A), T2 hyperintense to muscle (Fig. B), with associated gadolinium enhancement (Fig. C) that may be misinterpreted for multiple nerve sheath tumors along the gluteal nerves, or less likely intramuscular myxomas. Pseudoaneurysms, being vascular in etiology, are expected to centrally enhance with intravenous contrast unless thrombosed, as demonstrated in the larger left-sided lateral lesion (Fig. C) [1]. The aneurysm wall may also enhance when inflamed. Within the clinical context of infectious risk factors such as fever, leukocytosis, or positive blood cultures, visualization in the interventional suite of a focal saccular outpouching of contrast from a vessel provides this diagnosis (Fig. D). Increased diagnostic confidence is gained by Doppler ultrasonography typified by the “yin-yang” sign (Fig. E) of to-and-fro turbulent flow [1]. Ultrasonography for femoral artery pseudoaneurysms in particular approaches sensitivities of 94% and specificities of 97% [3], indicating high diagnostic utility.

Treatment of infected pseudoaneurysms is dependent upon location, size, and clinical presentation. Treatment and accurate diagnosis is critical, as infected pseudoaneurysms can be fatal if untreated, approaching mortality rates of 40% [4]. While many with minimal risk factors may be treated with antibiotics, others may require surgical excision of pseudoaneurysmal tissue and repair. Recent innovations in endovascular embolization have allowed for a less invasive

approach using coils as well as *N*-butyl-2-cyanoacrylate glue or thrombin for hemostasis within the pseudoaneurysmal sac [5].

Our patient underwent endovascular coiling of the pseudoaneurysms, followed by an ultrasound-guided aspiration of the fluid surrounding the thrombosed right superior gluteal artery pseudoaneurysm. She received long-term intravenous antibiotics and is to follow-up with angiography in 4–6 weeks to evaluate for gluteal artery recanalization.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflicts of interest.

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