Total hip arthroplasty with metal-on-polyethylene implants and metal-on-metal articulations have been an area of recent interest. This article describes a patient with a persistent small soft tissue mass on the anterior groin following total hip arthroplasty with negative findings on infection workup, including blood work and aspiration. Subsequent biopsy findings were consistent with organizing thrombus and necrosis. It then developed into an expansile soft tissue groin mass with significant femoral and pelvic bony destruction and soft tissue infiltration. Metallosis, the formation of a pseudocapsule, and aseptic lymphocyte vasculitis-associated lesions have also been an area of interest following adult hip reconstruction. Occasionally, the formation of subsequent lesions make revision surgery impossible to perform due to bony destruction and soft tissue limitations. Although few in number, most studies or cases that have linked metal-on-metal implants to pseudotumors have been treated with revision surgery and replacement of articulating surfaces. This case highlights a metal-on-polyethylene total hip arthroplasty with a mass presenting with pseudotumor-like characteristics. However, final histology demonstrated fibroadipose tissue with fat necrosis and fibrosis, thickened vascular vessels, and diffuse chronic inflammation with lymphocytic infiltrates, which are more consistent with an atypical inflammatory vascular tumor. The current case illustrates treatment difficulties and provides surgical options for when this event occurs. Although aseptic lymphocyte vasculitis-associated lesions have been observed with metal-on-polyethylene articulations, the multiorgan involvement in this case is unique. In this case, radical excision with hemipelvectomy and complex flap closure was a last resort treatment solution that staved off the prospect of patient mortality.
otal hip arthroplasty (THA) is effective at restoring function and relieving pain.\textsuperscript{1} However, rare, devastating complications can occur following the prosthesis placement. Formation of a pseudotumor, a destructive non-malignant soft tissue mass, can affect the normal structures surrounding the hip, including the muscles and nerves. This has been reported as early as 1974.\textsuperscript{2} The pathogenesis of pseudotumor in THA is uncertain, but it may involve cytotoxic and type 4 delayed hypersensitivity responses.\textsuperscript{3} Although few in number, most studies or cases have linked metal-on-metal implants to pseudotumors, requiring revisions.\textsuperscript{4,5} To the current authors’ knowledge, this is the first case report linking metal-on-polyethylene THA with a vascular mass with pseudotumor-like characteristics that required a complete hemipelvectomy.

**CASE REPORT**

A 72-year-old man presented with a 1-year history of insidious left hip pain associated with a soft tissue mass on the anterior groin. He did well but presented in 2004 with a left proximal femur and pelvis destruction with an expanding soft tissue groin mass rendering him unable to walk for approximately 3 months prior to admission. Radiographs showed additional soft tissue groin mass suggesting a cortically destructive enlarged soft tissue mass, originating from the left retroperitoneal cavity inferior to the kidney spreading distally to the left mid-thigh (Figure 3). Similar to the previous admission, infectious and malignancy workups, including an iliopsoas bone biopsy, were negative. Another angiogram was performed to rule out hemangioma or arteriovenous malformations due to its cystic nature demonstrating several foci of slow contrast puddling seen throughout the mass during the capillary phase, whereas the arterial phase was unremarkable, suggestive of cavernous-type hemangioma. Subsequently, vascular surgery thought that this mass might be due to venous malformation and recommended serial sclerotherapy involving local injections with alcohol to decrease blood flow to the region. Surgical resection was postponed until the mass could be reduced with other modalities.

The size of the mass decreased after each session of sclerotherapy but increased again after a few days. Thereafter, the patient was prescribed oral thalidomide, which acts as an antiangiogenesis effect on the soft tissue on the abdominal organs.

Figure 1: Initial anteroposterior radiograph of the left hip prior to revision of the femoral head showing moderate resorption of the proximal femur associated with radiopaque density of the soft tissue around the hip joint. The implants seem stable.

Figure 2: Anteroposterior radiograph of the left hip showing an expansile soft tissue mass surrounding the hip joint with pseudocapsule and severe osteolysis of the proximal femur and left hemipelvis.

Figure 3: Axial computed tomography scan showing a homogenous soft tissue mass from the inferior retroperitoneum to the left mid-thigh, causing destruction of the left iliac wing. Note the mass’ effect on the soft tissue on the abdominal organs.
agent, and he received external beam radiation to cause obliterative endarteritis that could lead to regression of the vascular mass to the upper thigh.6,7 The patient’s hip pain improved with radiation, but therapy was stopped due to skin ulcerations. The soft tissue mass continued to grow and prevented ambulation in February 2010.

He was then admitted to another hospital for chronic anemia, likely due to the patient’s chronic bleeding from the vascular mass. Due to his functional incapacity, decreased appetite, weight loss, and increasing need for blood transfusion, he underwent surgical resection of the mass with the known high morbidity and mortality rate. A multidisciplinary team consisting of Plastic Surgery, Surgical Oncology, and Orthopaedic Oncology (J.H.L., V.H.L., A.S., B.H.H.) was required for radical excision of the soft tissue mass with hemipelvectomy and complex flap closure (Figure 4).

Grossly, the soft tissue mass resembled fibrinous clots. Histologic analysis showed predominantly fibroadipose tissue with fat necrosis and fibrosis, thickened vascular vessels, and diffuse chronic inflammation with lymphocytic infiltrates (Figure 5). Acute osteomyelitis of the iliac bone with surrounding abscess formations were also identified. No particulates, metal, or polyethylene were seen in the samples.

Postoperatively, the patient’s appetite and hemodynamics improved and the flap survived. He was discharged 20 days postoperatively. At 9-month follow up, he was doing well with no recurrence.

**DISCUSSION**

Several case reports have documented the presence of inflammatory masses that have occurred after THA.6,7,10,11 This response has been documented with metal-on-metal and metal-on-polyethylene bearing surfaces.4,6,8,9 All patients were managed with local debridement and exchange of the articulating components to different bearing surfaces. All patients did well after surgical debridement and component exchange with no recurrence of the masses.12 A review of hip resurfacings revised for pseudotumors showed a significantly poorer outcome than when revised for other reasons, such as fracture or infection.12 Grammatopoulos et al12 reported that 70% of patients with metal-on-metal resurfacing with an inflammatory pseudotumor required revision. The outcome of these revisions “resulted in nearly half having encountered major complications and a third required further revision within a few years.”12 However, to the authors’ knowledge, no documented patient has required an extensive resection to remove the mass.

The current patient had extensive lymphocyte infiltrate in the area of the pseudocapsule, which is consistent with a type IV hypersensitivity reaction; however, the abscess formation and iliac osteomyelitis complicated the depiction of this case as a classic pseudotumor. This might be a secondary effect of multiple interventions prior to the resection, in light of the absence of infection with previous infectious workups. In addition, the transient response to antiangiogenesis agents questioned whether this was a vascular pseudotumor, but histologic reviews showed no vascular abnormality.

Because this patient had documented corrosion of the femoral head during his first revision surgery, it is likely that this was a metal reaction rather than a polyethylene reaction, which would explain the formation of a massive pseudotumor rather than the extensive osteolysis that would be expected with polyethylene wear.3,13 In addition to the corroded head, other potential contributors to metal ion release could come from the trunion-head and sleeve-stem interfaces with this particular implant design. However, this could not be further elucidated due to a lack of documentation.

**CONCLUSION**

The aim of this article was to share the consequences of the progression of an unknown pathology that needs to be further studied to promptly treat it.

**REFERENCES**


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