CARDIOLOGIE TUNISIENNE

CASE REPORT

Vascular reconstruction in inguinal melanoma metastasis

Reconstruction vasculaire dans les métastases du mélanome inguinal

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Summary

Malignant melanoma of unknown primary with vascular invasion is rare. We describe a challenging case of melanoma, with invasion of the femoral vessels.

A 44-year-old woman, complained from febrile inguinal lymphadenopathy. Biopsy suggested metastatic involvement with a melanoma.

The CT scan showed a left inguinal mass with vascular involvement. During surgery, the preservation of femoral vessels was not feasible due to the infiltrative nature of the mass.

Ilio-femoral arterial and venous bypasses were performed. The postoperative course was uneventful, with healing of the surgical wound.

Keywords

Inguinal melanoma, metastasis, vascular invasion, bypass.

Résumé

Le mélanome malin primitif inconnu est une affection rare. Il peut présenter une invasion vasculaire. Nous décrivons un cas de mélanome avec une masse ganglionnaire inguinale, et un envahissement des vaisseaux fémoraux.

Une patiente de 44 ans, consultait pour une lymphadénopathie inguinale. La biopsie suggérait une atteinte métastatique par un mélanome.

Le scanner montrait une volumineuse masse ganglionnaire inguinale avec envahissement vasculaire. En peropératoire, la préservation des vaisseaux fémoraux était impossible.

Des pontages artériels et veineux ilio-fémoraux ont été réalisés. Les suites opératoires étaient simples, avec cicatrisation de la plaie.

Mots-clés

Mélanome inguinal, métastase, envahissement vasculaire, pontage.

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INTRODUCTION

Malignant melanoma of unknown primary (MUP) is a rare and complex clinical entity, accounting for approximately 2% to 3.5% of all melanoma diagnoses [1, 2]. While the majority of melanomas are of cutaneous origin, a significant subset presents as metastatic disease in lymph nodes or visceral organs without a detectable primary lesion [2]. The most widely accepted biological explanation for this phenomenon is the spontaneous regression of the original cutaneous tumor, a process driven by a robust T-cell-mediated immune response [3]. However, despite the disappearance of the primary site, the metastatic focus can exhibit high aggressive potential, including vascular and structural invasion [4]. In this report, we describe a particularly challenging presentation of MUP involving an inguinal lymph node mass with direct invasion of the femoral artery and vein, necessitating radical surgical resection and complex vascular reconstruction [5].

CASE PRESENTATION

A 44-year-old female patient with a medical history for left thyroid lobectomy and autoimmune liver disease, had also a history of thrombocytopenia and leukopenia, likely secondary to her underlying hepatic disease.

She complained from febrile inguinal lymphadenopathy. Surgical excision biopsy suggested metastatic involvement consistent with a regressive melanoma, although histological analysis did not identify a clear primary tumor.

The preoperative contrast-enhanced CT scan showed a bulky left inguinal nodal mass with vascular involvement (Figure 1). She was admitted for a diagnostic left inguinal lymph node dissection. The preservation of femoral vessels was not feasible due to the aggressive and infiltrative nature of the mass. So, an ilio-femoral arterial bypass using a 6-mm PTFE prosthetic graft, and an ilio-femoral venous bypass using an 8-mm PTFE prosthetic graft were performed (Figure 2).

During the postoperative period, the patient developed severe anemia with a hemoglobin drop to 6.5 g/dl and a poor response to transfusion, complicated by a possible hemolytic component related to the detection of anti-Jk1 antibodies.

Imaging revealed a large postoperative hematoma measuring approximately 7 × 9 × 22 cm associated with thrombosis of the ilio-femoral venous prosthetic graft (Figure 3). This situation created a severe therapeutic dilemma regarding the need for anticoagulation in the setting of an active bleeding risk. The decision was a reoperation for hematoma evacuation and a stay in the intensive care unit.

The postoperative course was uneventful, with complete healing of the surgical wound. Follow-up imaging eventually demonstrated a patent arterial ilio-femoral bypass, although additional findings of hepato-splenomegaly and multiple lymphadenopathies suggested systemic progression of the disease.

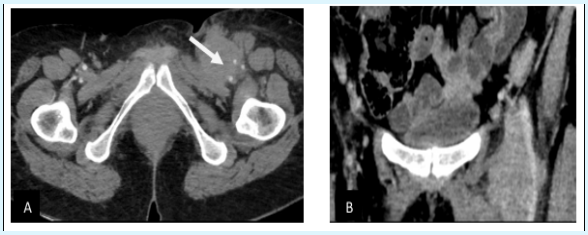

Figure 1. Preoperative contrast-enhanced CT image showing a bulky left inguinal nodal mass with vascular involvement.
(A) Axial image showing a bulky left inguinal nodal mass with irregular margins and heterogeneous enhancement. The mass circumferentially encases the superficial femoral artery, and involves more than 180° of the profunda femoral artery. It also invades the superficial femoral vein.
(B) Coronal reformatted image better demonstrating the longitudinal extent of vascular involvement and the invasion of the superficial femoral vein.

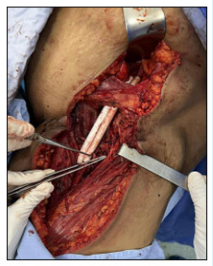

Figure 2. Intra-operative photography showing the ilio-femoral arterial and venous bypass grafts.

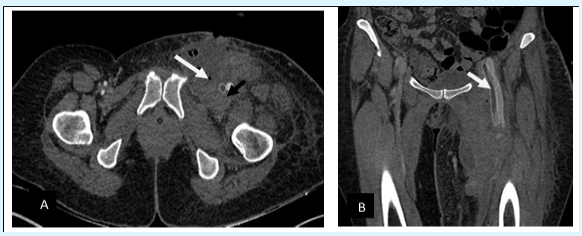

Figure 3. Postoperative contrast-enhanced CT showing a subacute hematoma with surinfection, and occlusion of the venous bypass graft.
(A) Postoperative axial contrast-enhanced CT image demonstrating a large heterogeneous left inguinal collection (white arrow) consistent with a subacute liquefying hematoma, containing internal air bubbles raising concern for superimposed infection. The arterial bypass graft appears patent (black arrow).
(B) Coronal venous-phase CT image confirming occlusion of the venous bypass graft (arrow).

DISCUSSION

The biological paradox of regressive melanoma lies in the coexistence of a successful immune-mediated clearance at the primary site and an uncontrolled, invasive proliferation at the metastatic site [3]. The phenomenon of spontaneous regression is an immunologic event characterized by a dense infiltrate of CD8+ T-lymphocytes and the eventual replacement of tumor cells by fibrotic tissue and melanophages [3]. However, the presence of MUP suggests that certain tumor cells undergo immune-editing, acquiring mutations that allow them to bypass the immune surveillance that destroyed the primary mass [2].

The involvement of the femoral artery and vein in such cases is a marker of high biological aggression. Unlike slow-growing sarcomas, melanoma can be highly infiltrative [4]. Recent genomic studies suggest that metastatic clones in MUP may overexpress matrix metallo-proteinases, specifically MMP-2 and MMP-9, which facilitate the degradation of the vascular adventitia and direct invasion of the common femoral artery or the femoral vein [9]. In such scenarios, a simple lymphadenectomy is oncologically insufficient. Aggressive vascular surgery, when combined with modern systemic therapy, offers a significant survival advantage over palliative care by achieving R0 resection [4, 11].

Insights from the literature emphasize the diversity of these presentations. Rastrelli and colleagues reported a giant inguinal mass initially misdiagnosed as an undifferentiated sarcoma, highlighting that atypical amelanotic sarcomatoid melanoma can mimic other malignancies and often requires radicalization with complex microsurgical flap reconstruction [6]. Similarly, Takai and Murata emphasized that direct melanoma invasion can lead to intra-luminal tumor thrombus formation within the femoral vein, a rare condition that requires precise preoperative radiological assessment [7].

The gold standard for managing vascular invasion in the groin, is an en bloc sacrifice of the involved segments followed by immediate reconstruction [5].

While the use of an autologous great saphenous vein graft from the contralateral leg is preferred to minimize infection risks, especially if postoperative radiotherapy is planned, emergency scenarios such as the one encountered in our case often necessitate the use of prosthetic grafts [5, 10]. Modern surgical oncology also emphasizes the importance of venous reconstruction to prevent debilitating chronic venous insufficiency and to maintain limb hemodynamics [4, 9]. To protect these reconstructions and provide a healthy tissue bed for potential radiotherapy, the transposition of the Sartorius muscle is considered a mandatory technical step [10, 11].

The role of radiotherapy in the multidisciplinary management of inguinal MUP is crucial yet complex. Adjuvant radiotherapy is frequently indicated in Stage III melanoma with extracapsular extension or large nodal diameters to improve regional control [8, 11]. However, the timing and field of radiation must be carefully planned in patients undergoing vascular reconstruction. Radiation induced fibrosis and radio-necrosis can compromise the integrity of vascular grafts, particularly prosthetic ones, increasing the risk of late thrombosis or graft-enteric fistulae. Fichelle and colleagues documented that post-radiation arterial lesions in the groin often require specialized trans-osseous ilio-femoral bypass combined with musculo-cutaneous flaps to ensure graft viability in a compromised vascular bed [8]. Furthermore, the emerging synergy between radiotherapy and checkpoint inhibitors, such as Nivolumab and Relatlimab, may enhance the systemic immune response through the abscopal effect, although it also increases the risk of local inflammatory complications at the surgical site [1, 11].

CONCLUSION

This case emphasizes that the spontaneous regression of a primary melanoma is not a guarantee of a benign course. The aggressive invasion of the femoral vessels by a metastatic MUP requires a multi-disciplinary approach combining radical surgical resection, vascular reconstruction, adjuvant radiotherapy, and modern immunotherapy.

Clinicians must maintain a high index of suspicion for invisible primary sites, as the regressive nature of the primary does not preclude the risk of severe local invasion or systemic recurrence. The limited available evidence suggests that aggressive surgical resection with vascular reconstruction can

achieve local control in selected patients. However, the rarity of these presentations necessitates individualized treatment planning and highlights the need for further case reports to better define optimal management strategies.

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