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Case Report

BENIGN HEMANGIOMA MASQUERADING AS A VASCULAR MALIGNANCY: A CASE REPORT OF A MASSIVE, RECURRENT, ULCERATING SHOULDER LESION REQUIRING RADICAL EXCISION AND LATISSIMUS DORSI FLAP RECONSTRUCTION

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ABSTRACT

Background: Adult-onset or recurrent subcutaneous hemangiomas of massive proportions are exceedingly rare clinical entities. When these benign vascular anomalies present with rapid growth, massive dimensions, overlying cutaneous ulceration, and radiological features denoting hypervascularity and flow voids, they clinically and radiologically mimic aggressive vascular malignancies such as angiosarcoma or hemangiopericytoma.

Case Presentation: We report the case of a 35-year-old male who presented with a massive, rapidly progressive, and intensely painful recurrent mass over the posterosuperior aspect of the left shoulder. The lesion had been previously excised in 2024 and diagnosed as a benign hemangioma. However, its aggressive clinical recurrence within 18 months, coupled with magnetic resonance imaging (MRI) revealing profound heterogeneity, cutaneous ulceration, and prominent axillary lymphadenopathy, raised high suspicion for malignant transformation. The patient underwent a radical wide local excision with 2 cm margins and axillary lymph node sampling, followed by immediate complex reconstruction utilizing a pedicled latissimus dorsi (LD) myocutaneous flap and a split-thickness skin graft (STSG). Final histopathological examination confirmed a benign hemangioma with complete margin clearance and reactive, tumor-free axillary lymph nodes.

Conclusions: This case underscores the diagnostic dilemma posed by aggressive, recurrent benign vascular lesions mimicking sarcomas. It highlights the imperative for radical oncologic clearance despite benign histories, and demonstrates the efficacy of regional pedicled flaps in reconstructing massive shoulder defects to ensure functional and aesthetic preservation.

KEYWORDS: Hemangioma, Vascular Neoplasm, Angiosarcoma Mimic, Latissimus Dorsi Flap, Wide Local Excision, Reconstructive Surgery, Soft-tissue Sarcoma.

Introduction

Vascular anomalies represent a highly diverse and complex spectrum of congenital and acquired lesions of the vascular system. The International Society for the Study of Vascular Anomalies (ISSVA) fundamentally categorizes these entities into two major dichotomous groups based on their cellular kinetics, endothelial characteristics, and clinical behavior - vascular tumors (characterized by endothelial proliferation) and vascular malformations (characterized by structural morphogenesis errors without endothelial turnover)[1]. Hemangiomas are the most ubiquitous subtype of benign vascular tumors. Infantile hemangiomas are remarkably common, affecting up to 4-5% of neonates and characteristically demonstrating a biphasic lifecycle of rapid postnatal proliferation followed by slow, spontaneous involution[2,3]. Adult-onset, persistent, or recurrent subcutaneous and intramuscular hemangiomas are clinically disparate and statistically rare. In the adult population, hemangiomas typically present as slow-growing, asymptomatic, and indolent masses[4]. When an adult patient presents with a rapidly expanding, massive, and recurrent vascular lesion, the clinical index of suspicion must fundamentally pivot toward aggressive soft-tissue sarcomas, particularly angiosarcoma, epithelioid hemangioendothelioma, or hemangiopericytoma.

The diagnostic differentiation between a massive, atypical benign hemangioma and a malignant vascular sarcoma is notoriously challenging. Clinically, features such as rapid volumetric expansion, spontaneous cutaneous ulceration, localized pain, tissue necrosis, and regional lymphadenopathy are classic hallmarks of malignancy[5,6]. Radiologically, magnetic resonance imaging (MRI) is the gold standard for soft tissue evaluation[7]. However, in the context of hypervascular lesions, both aggressive hemangiomas and angiosarcomas can demonstrate pronounced T2-weighted hyperintensity, intense and heterogenous post-contrast gadolinium enhancement, and the presence of serpiginous vascular flow voids[8]. Because core needle biopsies in highly vascularized and potentially necrotic soft-tissue masses yield a significant risk of severe hemorrhage and are frequently subject to sampling errors, wide local excision remains both the definitive diagnostic and therapeutic modality[9].

Surgical extirpation of massive lesions in an anatomical location such as the postero-superior shoulder and scapular region, creates a substantial composite defect involving the skin, subcutaneous tissue and underlying deep muscular fascia. Reconstruction should be aimed to be tension-free to prevent future wound dehiscence and joint contracture. This requires the utilization of robust, well-vascularized tissue flaps capable of obliterating anatomical dead space, providing stable coverage over mobile joints, and resisting the mechanical sheer forces inherent to shoulder ambulation. The latissimus dorsi (LD) myocutaneous flap, based on the thoracodorsal pedicle, is a workhorse in reconstructive surgery for this region. Its large surface area, reliable vascularity, and arc of rotation make it uniquely suited for the reconstruction of extensive posterior trunk and shoulder defects following major oncological resections[10,11].

This report demonstrates a rare presentation of a massive, rapidly recurring, and ulcerating hemangioma of the left shoulder in an adult male. This case presented a formidable multidisciplinary challenge and diagnostic dilemma by perfectly mimicking the clinical trajectory and radiological signature of a high-grade soft-tissue sarcoma. We detail the clinical progression, the radiological diagnostic ambiguities, the radical oncological resection approach, the complex reconstructive surgery utilizing a pedicled LD flap, and the definitive histopathological resolution of this unique diagnostic masquerade.

Case Presentation

Clinical Presentation

A 35 year old male, farmer by occupation, presented to the Surgical Oncology department in AIIMS Raipur with a chief complaint of a large, recurrent, rapidly progressive and intensely painful swelling over the postero-superior aspect of his left shoulder. As per the patient, it was progressively enlarging over the past 6 months. There was no prior history of local trauma. His past surgical history revealed that he had undergone a local excision of a mass in the exact same anatomical topography in early 2024. The initial presentation in 2024 involved a swelling of approximately 5x5 cm size. Excision was performed at an outside facility and later histopathology confirmed it as a benign hemangioma. Following a disease-free interval (DFI) of around 1.5 years, the lesion recurred at the same site, with alarming aggressiveness. It led to spontaneous overlying skin breakdown and chronic serosanguinous discharge. The patient had no known medical comorbidity, no prior history of tuberculosis, and no known drug allergies. He did not have any addiction or suggestive family history for any neoplastic or vascular syndromes.

Physical Examination

His performance status was ECOG (Easter Cooperative Oncology Group) 0. There were no pallor, icterus, cyanosis or clubbing. His BMI was 26 Kg/m2. On local examination of the left shoulder, a massive, firm, lobulated, and exophytic mass was noted in the postero-superior scapular and shoulder region. The dimensions of the tumor were clinically measured at approximately 10x10x4 cm. The overlying skin was tightly stretched, erythematous, and exhibited a central area of frank cutaneous ulceration with localized tissue necrosis and serosanguinous exudate. The mass was tender and firmly tethered to the overlying skin. It showed restricted mobility along all directions, but appeared to be free from the underlying muscle. Left upper limb peripheral pulses were bilaterally symmetrical

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and there was no evidence of distal neurological deficits. No axillary nodes were palpable. All systemic examination was unremarkable.



Figure 1.Left shoulder demonstrating a massive, lobulated, recurrent mass measuring approximately 10x10x4 cm, with significant overlying cutaneous ulceration, skin stretching, and erythema

Radiological and Histopathological Evaluation

The diagnostic journey of the patient's primary presentation began in early 2024. Upon clinical presentation of a swelling in the left shoulder region, he was evaluated with a doppler ultrasound of the local swelling, which demonstrated a heterogeneously hyperechoic mass in the subcutaneous plane containing multiple dilated, tortuous vascular channels exhibiting both venous and arterial flow with low-resistance waveforms - initially suggesting an arteriovenous malformation. It was subsequently managed with primary excision. Final histopathology revealed medium-sized dilated blood vessels filled with blood and fibrofatty tissue, resulting in definitive diagnosis of a benign hemangioma.

As the patient developed aggressive recurrence after a DFI of approximately 1.5 years, he underwent comprehensive restaging. A contrast-enhanced MRI (CEMRI) scan of the left shoulder region revealed a large, heterogeneous, lobulated mass lesion of size 10x9.1x4.2 cm, situated in the subcutaneous plane of the postero-superior left shoulder. The lesion displayed a predominant hyperintense signal on T2/STIR sequences and an intermediate signal on T1-weighted images. The mass exhibited intense and heterogeneous post-contrast enhancement. A critical radiological feature was the presence of multiple tortuous vascular flow voids within the mass substance - indicative of high-velocity vascular flow. It showed no overt deeper extension into the underlying muscle. Prominent medial axillary lymph nodes with preserved fatty hila were noted, measuring up to 9.2 mm in the short axis. The radiological differential diagnosis strongly prioritized a malignant vascular neoplasm versus an aggressive benign vascular lesion.

Non-contrast computed tomography (NCCT) of the thorax was performed as a routine metastatic work up. It revealed a well-defined, 7.2x8.5x4 cm, soft tissue attenuating lesion in the left suprascapular region, interspersed with subcutaneous fat. The lesion was supplied by linear vessel-like structures and was abutting the trapezius muscle medially and the deltoid laterally, with preserved fat planes. The pulmonary parenchyma, mediastinum, and visualized bony structures were free of metastatic deposits.

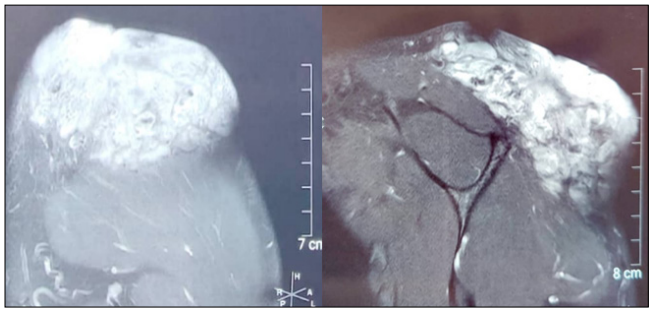


Figure 2.Axial and coronal sections from the CEMRI demonstrating a large, exophytic, hyperintense, and lobulated mass in the subcutaneous plane of the left shoulder highlighting intense contrast enhancement, internal vascular flow voids, and the preservation of the deeper myofascial planes despite the aggressive overlying cutaneous ulceration

Surgical Management and Reconstruction

In view of rapid recurrence, massive size, spontaneous ulceration, chronic serosanguinous discharge, and indeterminate imaging concerning vascular malignancy, the multidisciplinary tumor board consensus mandated a radical en bloc wide local excision with regional lymph node sampling, followed by immediate reconstruction.

Under general anesthesia, the patient was initially positioned supine with the left arm in 90 degrees of abduction. A curvilinear incision was made 1 cm below the left axillary hairline and skin flaps were raised anteriorly to the lateral border of the pectoralis major and posteriorly to the LD. A meticulous low axillary tissue sampling was performed and all prominent lymph nodes were harvested. The patient was subsequently repositioned into the right lateral decubitus position, carefully padded, re-prepped, and draped. A gross macroscopic surgical margin of 2 cm all around the tumor was marked circumferentially. Skin incision was deepened through the subcutaneous tissues down to the underlying muscle. The entire tumor, along with its overlying ulcerated skin envelope, underlying deep muscular fascia, and the surrounding soft tissue margins, was dissected en bloc off the underlying muscle. The underlying muscle appeared to be free from invasion - confirming the radiological finding. This resulted in a massive composite defect over the left shoulder, exposing the underlying deltoid, supraspinatus and trapezius muscle beds.

The reconstruction team took over for the pedicled LD muscle flap reconstruction. A vertical incision was made along the posterior axillary fold, extending inferiorly. The dissection proceeded deep to identify the belly of the LD muscle. The muscle was systematically released from its inferior, medial, and lateral attachments. The dissection was carefully continued superiorly into the axilla to identify, skeletonize, and protect the thoracodorsal vascular

pedicle. The thoracodorsal nerve was selectively divided to prevent post-operative symptomatic muscle twitching and to promote muscle atrophy for a better final aesthetic contour. The entire LD flap was transposed through a wide subfascial tunnel to completely obliterate the dead space and cover the shoulder defect. Vacuum drains were placed both in the axilla and the LD donor site.

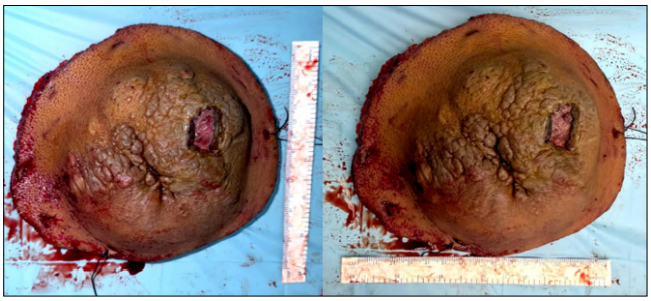


Figure 3.Gross surgical specimen following radical wide local excision of the massive, recurrent left shoulder hemangioma



Figure 4.Intraoperative LD Flap Harvest

A muscle-only flap was utilized to minimize donor site morbidity - mandating skin coverage for the exposed surface of the transposed LD muscle. A split-thickness skin graft (STSG) was harvested from the patient's left thigh. The STSG was extensively meshed and applied over the exposed LD muscle flap.

Postoperative Course

The patient was extubated on the table and started on an oral diet from post-operative day (POD) 0. Immediate post-operative management prioritized the viability and uptake of the pedicled flap and STSG. For initial 5 days, the patient was strictly nursed in the right lateral position, and supine position was absolutely contraindicated to prevent mechanical compression and subsequent thrombosis of the thoracodorsal pedicle crossing the subfascial tunnel. Vacuum drains were monitored closely to avoid loss of negative pressure and dressings were changed frequently once soaked. The graft site was dressed with paraffin gauze. The patient had an uneventful recovery. His axillary and LD donor site drains were removed on POD 8 and 12 respectively. The STSG showed complete uptake over the muscle flap. LD donor site healed by primary intention without seroma formation. The STSG donor site wound was noted to be healthy after removing the dressing on POD 15. He was discharged with stable hemodynamics and satisfactory pain control.



Figure 5.Immediate postoperative appearance of the massive left shoulder defect - the defect has been entirely reconstructed following the transposition of the LD muscle flap and final surface coverage utilizing a meshed STSG harvested from the left thigh

Final Histopathology and Follow up

The specimen measured 16x14x5.5 cm and exhibited a central frank ulceration of size 2.5x1.5 cm. The cut surface revealed a solid, grayish-white tumor mass measuring 6.5x3.5x1.5 cm. All margins were adequately free along with the base, which was 2.5 cm away from the tumor capsule. Microscopy of the primary tumor revealed a dermal and subcutaneous tumor with overlying epidermal ulceration covered by a fibrinosuppurative exudate. The tumor parenchyma was composed of variable-sized, complex vascular channels lined by a single layer of flattened, cytologically bland endothelial cells. These channels were arranged in a multilobulated pattern, separated by prominent intervening fibrous septa that extended deep into the subcutaneous adipose tissue. A focal lymphoplasmacytic inflammatory infiltrate was noted in the superficial aspects of the tumor, likely a reaction to the overlying cutaneous ulceration. Large, thick-walled, dilated blood vessels were scattered throughout the stroma. There were no cellular atypia, atypical mitotic figures, lymphovascular invasion (LVI), or perineural invasion (PNI). Microscopic examination of the axillary tissue revealed 15 distinct reactive lymph nodes, all of which were devoid of metastatic tumor deposits. The definitive macroscopic and microscopic features were those of a benign hemangioma.

The patient was planned to keep on regular outpatient follow up at 3 months interval for the first 2 years in view of history of rapid recurrence. Currently, at 6 months post surgery, the patient demonstrates excellent flap integration, complete healing of the skin graft, and no clinical signs of recurrence.

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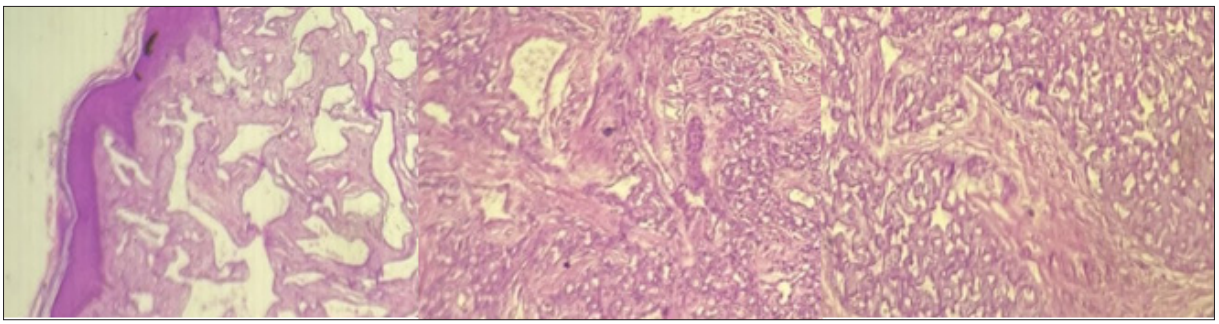


Figure 6.Histopathological examination revealing variable-sized, complex vascular channels lined by a single layer of flattened, cytologically bland endothelial cells, consistent with a benign hemangioma

Discussion

The presentation of a rapidly recurring, deeply ulcerating, and massive vascular lesion in an adult patient represents one of the most treacherous diagnostic pathways in soft-tissue surgical oncology. While hemangiomas are the most common benign tumors of infancy, adult-onset or recurrent massive hemangiomas are clinical outliers[2-4]. The differential diagnosis for an adult presenting with a massive, painful, bleeding vascular mass of the shoulder inherently leans heavily toward malignant etiologies. Chief among these is angiosarcoma, a highly aggressive malignant endothelial cell tumor known for rapid local infiltration, early hematogenous metastasis, and a dismal overall prognosis[12,13]. Other differentials include epithelioid hemangioendothelioma, hemangiopericytoma, and highly vascularized soft-tissue sarcomas such as undifferentiated pleomorphic sarcoma.

In this patient, the clinical timeline was highly concerning. Following a primary excision of a benign hemangioma in early 2024, the patient experienced a massive local recurrence within approximately 18 months. This accelerated growth kinetics, combined with the spontaneous breakdown of the overlying cutaneous envelope, is a classic harbinger of sarcomatous transformation or an initial histopathological misdiagnosis. Cutaneous ulceration in vascular tumors typically occurs due to outstripping of the local blood supply by rapid cellular proliferation, or via direct ischemic necrosis induced by tumor thrombosis[5,14].

Radiological evaluation via MRI further compounded the diagnostic ambiguity. The hallmark of a hemangioma on MRI is typically a well-circumscribed, lobulated mass that is iso- or hypointense to skeletal muscle on T1-weighted sequences and strikingly hyperintense on T2-weighted and STIR sequences. Following gadolinium contrast, they usually exhibit intense, homogenous enhancement[15]. However, as hemangiomas grow larger, they often undergo involutional changes, thrombosis, hemorrhage, and fibrosis, leading to extreme MRI heterogeneity, as seen in our patient. Furthermore, the presence of distinct vascular "flow voids" (areas of absent signal due to high-velocity blood flow) is frequently observed in high-flow vascular malformations and highly vascular malignancies like angiosarcoma, making the distinction exceedingly difficult on imaging alone[8]. The prominent axillary lymphadenopathy observed on the MRI further elevated the suspicion of regional lymphatic metastasis, a common dissemination route for certain soft tissue sarcomas and skin-associated malignancies.

Given this aggressive clinical and radiological phenotype, the decision by the multidisciplinary tumor board to proceed with a radical wide local excision rather than a marginal excision or incisional biopsy was both oncologically sound and practically necessary. Incisional or core-needle biopsies in suspected massive vascular sarcomas are fraught with complications. They carry a high risk of catastrophic, uncontrollable hemorrhage, and owing to the heterogeneous nature of massive tumors, where areas of bland benignity may sit adjacent to foci of high-grade sarcoma, they are notoriously prone to sampling errors[16]. By executing a wide local excision with 2 cm margins, the surgical team achieved both definitive, zero-error diagnostic tissue acquisition and definitive therapeutic extirpation in a single setting. The concurrent sampling of the radiologically enlarged axillary lymph nodes was a crucial staging adjunct, ensuring that if final pathology yielded a malignant diagnosis, regional staging would already be complete.

The surgical excision resulted in a massive, composite, three-dimensional defect of the posterosuperior shoulder, exposing the underlying muscle. The shoulder is a highly dynamic anatomical joint, requiring reconstructive options that provide not just static coverage, but durable, pliable, and well-vascularized tissue that can withstand constant mechanical shearing[17]. Primary closure was anatomically impossible. Skin grafting alone over a deep, irregular defect in a high-mobility area leads to severe contracture, poor aesthetic outcomes, and a high risk of graft breakdown over time. Consequently, the utilization of a pedicled LD myocutaneous/muscle flap was the optimal reconstructive choice.

The LD flap is classified as a Mathes and Nahai Type V muscle flap. It possesses a dominant vascular pedicle, the thoracodorsal artery - a continuation of the subscapular artery, and secondary segmental pedicles from the posterior intercostal and lumbar arteries[10,11]. In this procedure, dividing the segmental vessels and rotating the muscle

solely on its robust thoracodorsal pedicle provided an immense arc of rotation, easily reaching the posterosuperior shoulder defect. By utilizing a muscle-only flap covered with a meshed STSG, the reconstructive team minimized the severe donor site morbidity, like contour deformity and tight primary closure, frequently associated with harvesting a large, chimeric myocutaneous LD flap. Tunneling the flap subfascially ensured a superior aesthetic contour by preventing an unsightly cutaneous bridge and protecting the vascular pedicle from external compression, provided the strict lateral decubitus postoperative positioning protocol was adhered to.

The final histopathological revelation that this massive, destructive, and rapidly recurring lesion was entirely benign, is a testament to the fact that benign vascular anomalies can exhibit incredibly aggressive local behavior. The prominent axillary lymph nodes identified on MRI and resected surgically were proven to be entirely reactive - likely secondary to the intense local inflammation and chronic infection associated with the superficial cutaneous ulceration, rather than metastatic infiltration.

While this case offers a robust educational framework regarding the surgical management of complex soft-tissue masses, it is not without limitations. Foremost is the relatively short duration of postoperative follow-up documented at this time. Given that the patient already experienced a rapid, massive recurrence following his primary excision in 2024, longitudinal surveillance over the next 24 to 60 months will be critical to ascertain the true long-term efficacy of the radical wide local excision in preventing tertiary recurrence. Furthermore, modern advances in the understanding of vascular anomalies heavily rely on genetic and molecular profiling. Somatic mutations, particularly in the PIK3CA or BRAF pathways, are increasingly being identified in complex, therapy-resistant, or recurrent vascular malformations and tumors. The lack of advanced molecular or immunohistochemical (IHC) profiling in this case limits our understanding of the specific molecular drivers that precipitated this benign tumor's hyper-aggressive clinical recurrence.

Conclusion

We describe an extraordinary case of an adult male presenting with a massive, recurrent, and ulcerating shoulder hemangioma that closely masqueraded as an aggressive vascular malignancy both clinically and radiologically. This case highlights that benign vascular tumors in adult patients can display highly destructive local growth kinetics, making them difficult to differentiate from high-grade sarcomas prior to full surgical removal. A coordinated multidisciplinary approach, combining radical wide local excision to achieve clear margins with immediate, sophisticated reconstruction via a pedicled latissimus dorsi muscle flap, delivered excellent functional, oncological, and aesthetic results. Ultimately, this experience reinforces the surgical principle that massive or atypical vascular lesions must be managed with high oncological suspicion until comprehensive, wide-margin histopathology provides a definitive diagnosis.

Declarations

Authors' Contributions: All the authors equally contributed the work.

Disclaimer (Artificial Intelligence): This manuscript was prepared through the combined contributions of all author(s), including contributions to the study design, data, content development, results, interpretation, and related scholarly work. The author(s) acknowledge the use of Grammarly and Google Gemini Notebook to assist with grammar checking, language refinement, and reference formatting. These AI-assisted tools were not used as authors and did not replace the intellectual contributions or scholarly judgment of the author(s). All AI-assisted outputs, including content, references, and interpretations, were carefully reviewed, revised, verified, and approved by the author(s). The author(s) accept full responsibility for the accuracy, integrity, and final content of the manuscript.

Conflicts of Interest: There is no conflict of interest associated with this study.

Consent to Participate: There is consent to participate.

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