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Case Report

Giant infiltrating intermuscular angiolipoma of the posterior axioappendicular region in a cadaver: gross and microscopic features

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SUMMARY

Background: Infiltrating intermuscular angiolipomas are rare. We report a cadaveric case of infiltrating angiolipoma in the muscles of the Posterior Thoraco-Lumbar region with literature in the context of clinical anatomy. This is a diagnosis-related case report on specimen from adult (45-year-old) Ugandan male cadaver in the Human Anatomy Laboratory, Department of Human Anatomy, Kampala International University, Western Campus, Bushenyi, Uganda.

Method: A mass was encountered during routine cadaveric dissections, examined in situ, excised, measured and weighed at the Laboratory before routine histological tissue processing at Histopathology laboratory of Kampala International University, Teaching Hospital, Bushenyi, Uganda.

Results: The macroscopic assessment showed a non-capsulated homogenous yellow mass located between the trapezius muscle above and rhomboid major muscle below, invaded the dorsal scapular blood vessels from the rhomboid major muscle. It weighed 47.03 g, 8.5 cm x 6.6 cm x 1.7 cm (length, width, and thickness). Microscopic analysis shows mature fat cells, prominent blood vascular components, and no myxoid areas. Infiltrating intermuscular angiolipomas of the chest wall are very rare and to our knowledge, there is the scantiness of similar cases, hence we are presenting a new case of a giant infiltrating intermuscular angiolipoma of the posterior axioappendicular region, with particular emphasis on gross and microscopic features in a cadaver.

Conclusion: If such a case was to occur in a living person, the angiolipomas would require complete surgical excision to prevent continued growth, invasion, and recurrence in the living individual.

INTRODUCTION

According to the World Health Organization (WHO), bone and soft tissue tumor classification of 2002 and modified in 2013 states that lipomatous tumors are soft tissue tumors and are histologically subdivided into lipoma, lipomatosis, lipomatosis of nerve, lipoblastoma, angiolipoma, chondroid lipoma, myolipoma, spindle-cell lipoma, hibernoma, and dedifferentiated liposarcoma.[1–4] Angiolipoma is a subcutaneous nodule showing mature adipocytes mixed with small vessels most of which are thrombotic.[1] The WHO classification identifies angiolipomas as infiltrating or non-infiltrating types with the very rare infiltrating partially or completely penetrating deep into the soft tissues, thus mimicking aggressive tumors.[1–4]

The aim of this study, therefore, was to report a cadaveric case of a rare infiltrating intermuscular angiolipoma of the posterior axioappendicular region and compare with the literature on live-occurring specimens

MATERIALS AND METHODS

Institutional Approval and Ethical Clearance

The specimens were discovered in one singular individual during routine dissection of one formalin-fixed cadavers in the Gross Anatomy Laboratory at Kampala International University, Western Campus located in Western Uganda. Since this was a cadaveric case report performed on institutional cadavers, the subject's written informed consent was not required. However, all other ethical issues were addressed during the writing of the case report, including, but not limited to maintaining the cadaver's identity, privacy, confidentiality, and obtaining institutional approval and ethical clearance to carry out the study. Ethical approval was acquired from the Scientific and Ethics review committee of Kampala International University Western Campus, Uganda

with the approval number (Nr.UG-REC-03/202050).

Thus, the Adipocytic specimen used was from a 45-year-old male Ugandan cadaver belonging to the ethnic group of Bantu peoples (Ankole tribe of western Uganda). Dissection was done by the usual dissection process using a method described by Cunningham.[5] The dissection and observations were carried out by at least three of the authors.

Gross Macroscopic Findings

During dissection of the posterior axioappendicular region (i.e., the back and shoulder), we noticed an unusual mass in the posterolateral axioappendicular region. On gross examination of the mass in situ, we identified a moderately soft mobile yellow mass that had infiltrated the soft tissues to be located between the trapezius muscle superficially, and the rhomboid major muscle in the deeper aspects. (Figure 1A). Reflection of the tumor revealed an unencapsulated mass firmly adherent to the rhomboid major muscle, and completely encircling the dorsal scapular blood vessels that supply rhomboid major muscles (Figure 1B). Subsequent excision, extraction and finer dissection revealed unencapsulated lobulated homogenous yellow mass weighing 47.03 g and measuring 8.5 cm in length, 6.6 cm in width, and 1.7 cm in thickness (Figure 1C). Based on its macroscopically large size (>2 cm in diameter) fatty appearance, being non-encapsulated, invasion of blood vessels, and its deep location between the muscle layers, it was provisionally diagnosed as a giant infiltrating intermuscular angiolipoma.

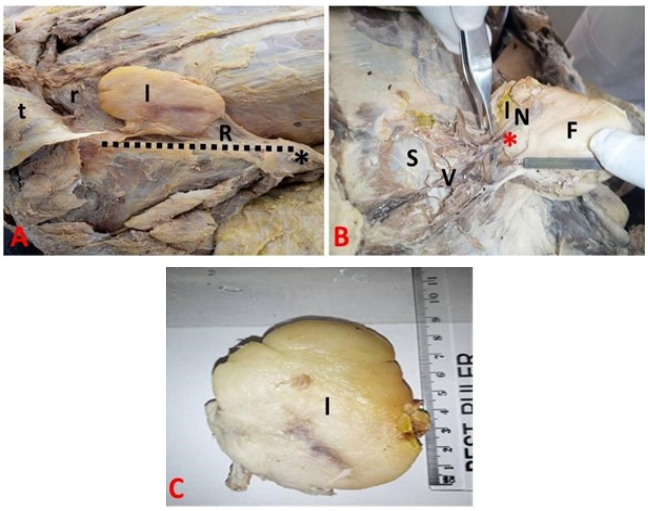

Figure 1: Gross features of a giant infiltrating intermuscular angiolipoma in a 45-year adult male cadaver. Dorsal view of the dissected superolateral posterior axioappendicular region: A = tumor in situ (l) between the reflected trapezius above (t), and rhomboid major muscle beneath (R). r = rhomboid minor muscle, imaginary features: dotted line = outline of medial border of the scapula, the black star * = inferior angle of the scapula. This is an infiltrating intermuscular mass. B = reflected both rhomboid major muscle and adipocytic tissue (l) showing prominent twig of a blood vessel (red star*) being circled by the mass, this is a continuation of the dorsal scapular vessels (V). F = deep fascia ensheathing rhomboid major muscle, N = dorsal scapular nerve, S = space normally occupied by rhomboid major muscle before being reflected. Note that the tumor is firmly attached to the muscle. C = post-dissection excised specimen (l) showing an unencapsulated yellow homogenous lobulated appearance, and size of mass >2 cm in diameter. Findings are suggestive of a giant infiltrating intermuscular angiolipoma.

Microscopic Assessment

Microscopic analysis was done as previously described by.[6] Briefly, the tissues were removed and fixed in 10 % formosaline for 48 h. After 48 h, the tissues were removed from the 10 % formosaline, and passed further through the routine stages of tissue processing for histological studies, dehydrated in various grades of ethanol, cleared in benzene, infiltrated and embedded in paraffin wax. The tissue blocks were trimmed and mounted on wooden blocks. They were sectioned on a rotatory microtome at 5 µm in thickness. The sections were stained with Haematoxylin and Eosin (H & E). Photomicrographs were taken using X100 and X40 objective lenses for each group. Immunohistochemical study and molecular analysis were not performed. Confirmation of the mass as an angiolipoma, histologically combined with its non-encapsulated nature, and its invasion of the soft tissues (e.g., intermuscular and angiogenic invasions), were consistent with an infiltrating intermuscular angiolipoma. Microscopically, the mass was composed of mature adipocytes with prominent blood supply (arterioles and venules), and lack of myxoid component. The components were arranged irregularly and mixed. These features were consistent with angiolipoma (Figures 2 A, B).

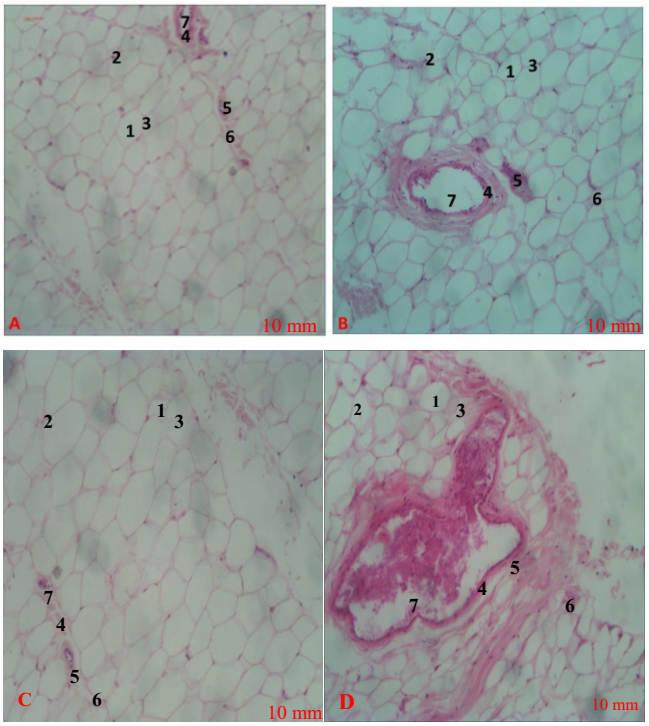

Figure 2: Microscopic features of an angiolipoma in a 45-year adult male cadaver. H & E photomicrographs (transverse sections) of angiolipoma tissue x40 (A), angiolipoma tissue x100 (B), control of fatty tissue x40 (C), and control of fatty tissue x100 (D), 1 = mature fat cells, 2 = adipocyte nuclei, 3 = adipocyte cytoplasm, 4 = arterioles, 5 = venules, 6 = fibroblasts, 7 = arteriole lumens. Scale bar = 10 mm. Presence of prominent, vascular structures. These features depict mature adipose and proliferated vascular tissue consistent with an angiolipoma. Abbreviation: H & E = hematoxylin and eosin, x= magnification.

DISCUSSION

In accordance with the WHO classification of lipomatous tumors, the study case fits the diagnosis of infiltrating angiolipoma, a rather uncommon type as compared to the non-infiltrating one.[1-4,7] A search for cases of intermuscular angiolipoma revealed only a limited number of documented cases consistent with the finding of Arenaz et al.[8] This study case of infiltrating intermuscular angiolipoma had invaded deeper structures i.e. between muscles (trapezius and rhomboid major muscles), and encroaching on blood vessels (dorsal scapular blood vessels), a finding consistent with previous cases.[6,9] Continued growth, invasiveness, and compression of blood vessels, nerves, and other soft tissues are encountered in infiltrating angiolipomas commonly leading to severe neuropathic, muscular, and joint pains.[10-11] Therefore, the most viable treatment option is the complete removal of the tumor surgically to avoid the continued growth, recurrence, and complications that are common with infiltrating angiolipomas.[9–12]

Similar to the current case, angiolipomas are the most prevalent type in the trunk and upper limbs compared to other lipomatous lesions.[10,13] However, it is unusual to find infiltrating angiolipomas in the posterior chest wall muscles (e.g. trapezius and rhomboid major for our case) since infiltrating angiolipomas occur mostly in the muscles of the lower limbs in 50% of the cases, and rarely in other places (upper limbs, 20%; chest wall, 20%; and other locations, 10%).[10,11,14–16] Finding the infiltrating angiolipoma in a 45-year-old man for the current case seems usual (most infiltrating angiolipomas occur in patients who are older than 30 years).[8] However, age and sex are very variable factors in the occurrence of angiolipomas, e.g. some cases have shown no sex predominance and that the masses could occur in all age groups.[8]

By considering either the location of the mass or microscopic appearance, the major differential diagnoses of infiltrating intermuscular angiolipoma include soft-tissue angiomatosis, non-infiltrating angiolipoma, and intramuscular angioma. Soft-tissue angiomatosis is the diffuse proliferation of benign vascular structures, associated with mature fat tissue, which involves a large segment of the body in a continuous pattern, histologically they contain clusters of thick-walled capillary-like vessels near veins, many endothelial cells in the vessels of soft tissue angiomatosis, intermingled with fat tissue in continuous tissue planes and usually with myxoid areas. Intramuscular angioma is located within a skeletal muscle with histopathological features being mature adipose tissue, blood component, and muscle tissue.[17] Non-infiltrating angiolipomas are encapsulated and are located subcutaneously.[18] Other differential diagnoses might be the deep intermuscular lipoma and infiltrating lipoma. The deep intermuscular lipoma is a benign tumor composed of mature adipose tissue and is intimately associated specific non-adipose (muscle) tissue similar to our case but histologically its fat tissue does not contain prominent blood vascular structure; infiltrating lipoma affects multiple tissues such as skin, subcutaneous tissue, muscle, bone, and histological analysis shows no prominent blood vasculature being intermingled in the adipocytic tissue.[2]

Subsequently, infiltrating intermuscular angiolipoma might mimic soft tissue angiomatosis, non-infiltrating angiolipoma, intramuscular angioma, especially if the lesion is large. Knowledge of the histological composition, the pattern of vascular component, and anatomico-pathological correlation are vital to prevent misdiagnosis.

Furthermore, the diagnosis of 'infiltrating angiolipoma' is controversial, with some authors diagnosing them as intramuscular hemangiomas with fatty overgrowth, and infiltrating lipoma; and the above two forms could be continuous intermediate stages of the same lesion. [2,8]

Since the mass was obtained from a cadaver, we could not establish some of the patient's vital information associated with the swelling such as patient's symptoms, family and psychosocial history, medical history, etiology and risks, treatment history, interventions, prognosis, and follow-up. Additionally, the patient's written informed consent was not applicable since this was a cadaveric case report.

CONCLUSION

This study presents another case of a giant infiltrating intermuscular angiolipoma of the posterior axioappendicular region, with particular emphasis on its gross and microscopic features. Although extremely rare, infiltrating intermuscular angiolipoma ought to be thought of as a differential diagnosis of chest wall lesions. If such cases occur in living persons, these angiolipomas would require complete surgical excision because infiltrating angiolipomas are invasive, with high rates of growth and recurrence. Thus, the surgical management of the lesion in living humans is associated with a good prognosis provided the tumor is completely excised.

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Competing interests

The authors declare no conflicts of interest in this work.

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