Angiomyofibroblastoma mimicking an inguinal hernia: a challenging diagnosis in a male patient

Laura Banias1, Simona Gurzu1, Ioan Jung1, Cristian Borz2

1Department of Pathology, University of Medicine, Pharmacy, Sciences and Technology, Tîrgu-Mureș, Romania
2Department of Surgery, University of Medicine, Pharmacy, Sciences and Technology, Tîrgu-Mureș, Romania

Abstract

Introduction: Angiomyofibroblastoma is a rare benign myofibroblastic neoplasm which mainly occurs in the soft tissues of the pelvi-perineal region of females. Fletcher et al. described this lesion for the first time in 1992 [1, 2].

In this paper we present the 14th case of AMF reported in the Medline database until the beginning of 2017, as arising in the inguinal region of a male patient [3, 4]. The particularity of the case consists in its incidental finding in the inguinal region’s soft tissue, this mass being preoperatively diagnosed as a hernial sac. The unusual nuclear expression of c-theta (PKCθ) protein, a marker considered to be relatively specific for c-KIT negative gastrointestinal tumours (GIST) was described for the first time in the literature [5]. The criteria of differential diagnosis were also determined.

Case report

A 62-year-old male, previously diagnosed with high blood pressure, gout, haemoptysis and tuberculosis was admitted to the Surgical Department with an irreducible and painless slow growing inguinal mass. After physical examination and ultrasonography, the case was interpreted as an inguinal hernia with indication for surgery. Laboratory tests presented parameter values within normal ranges, with slightly elevated blood uric acid: 9.52 mg/dl (normal values = 3.6–7 mg/dl).

The patient signed consent to surgical intervention and publication of the case was obtained before surgery. During surgery, a nodular, encapsulated mass was discovered and excised along with lymph nodes from the femoral region.

The macroscopic aspect of the gross specimen revealed an encapsulated nodule measuring 55 × 35 ×
Laura Banias, Simona Gurzu, Ioan Jung, Cristian Borz

25 mm, with a grey, thin, smooth exterior surface and a tan colour cut surface, without haemorrhages or necroses, without infiltrating features (Figure 1).

Microscopical examination revealed a cellular proliferation with varying density, well-circumscribed by a peripheral loose connective tissue. At high-power view, the tumour was composed from round, oval-shaped and elongated cells of varying dimensions, with clear, vacuolated or eosinophilic cytoplasm, pleomorphic hyperchromatic nuclei with no nucleoli. Cells were arranged in small groups, sometimes cords, bundles and fascicles disposed around small blood vessels and were separated by connective tissue fibers. A few mature adipocytes were present, with no atypia. No necrosis, areas of haemorrhage or atypical mitotic figures were observed. The stroma was well-vascularized by small and medium-size thin-walled blood vessels and presented focal myxoid features (Figure 1).

The tumour cells displayed positivity for desmin, vimentin, CD34, oestrogen (ER) and progesterone receptors (PR), nuclear positivity for PKCθ and a Ki67 proliferation index of about 20%. They were negative for smooth

Figure 1. The angiomyofibroblastoma presented in the inguinal region of a male patient is displayed as an encapsulated solid mass with a tan colour cut surface (A). Microscopically, the well-circumscribed tumour (B) consists on small groups of round, oval-shaped and elongated cells with clear, vacuolated or eosinophilic cytoplasm and pleomorphic hyperchromatic nuclei with no nucleoli (C). The tumour cells are positive for desmin (D), CD34 (E) and oestrogen-receptor (F) and display unusual PKCθ nuclear positivity (G)

| Parameter                        | Angiomyofibroblastoma                                      | Cellular angiofibroma                                  | Aggressive angiomyxoma                                |
|----------------------------------|------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|
| Gross aspects                    | Well-demarcated by a thin fibrous pseudocapsule            | Well-circumscribed by a thin fibrous pseudocapsule     | Ill-defined, usually infiltrates the surrounding tissues (may present entrapped nerves, muscle fibers) |
| Cellularity                      | Alternating hypocellular and hypercellular areas; round and spindled cells (plasmacytoid, epithelioid) disposed in cords and nests around blood vessels; few mature adipocytes may be present (in 10% of cases); often contains mast cells | Higher cellular density, round and spindle-shaped cells distributed haphazardly or in short fascicles; may contain mature adipocytes (in 50% of cases); focal lymphocytic aggregates and few mast cells | Hypocellular proliferation of short spindle and stellate cells, radiating from vessel walls; multinucleated cells may be observed |
| Stroma                           | Oedematous, myxoid degeneration, collagen fibers which separate tumour cells | Collagenous, with thicker collagen bundles, may be hyalinized | Abundant myxoid stroma; may present hematic extravasate |
| Vascularisation                  | Abundant thin-walled, small to medium-sized vessels (capillary-type), irregularly distributed | Prominent large, larger thick-walled vessels, mostly with hyalinized walls and absence of perivascular adipocytes | Thin and thick-walled vessels, hyalinized or hypertrophic, of variable size |
| Immunoprofile                    | Desm+ (in all cases), ER+, PgR+, Vim+, CD34 (rarely), SMA (rarely), S100− | Vim+, Desm+−/− (almost always negative), CD34+, Vim+, SMA+, ER−/−, PgR−/−, S100− | Desm+, CD34+, CD44+, ER+, PgR+, Vim+, S100− |

Desm – desmin, ER – oestrogen receptor, PgR – progesterone receptor, Vim – vimentin, SMA – smooth muscle actin.
Angiomyofibroblastoma mimicking an inguinal hernia: a challenging diagnosis in a male patient

Discussion

The AMF shares many of its aspects with cellular angiofibroma (CA) and aggressive angiomyxoma (AA). Mitotic activity is absent or low in all of these lesions and due to the overlapping histological and immunohistochemical features, the differential diagnosis becomes problematic. The AMF and CA present a benign behaviour and surgical removal is mostly curative, with exceptional recurrences in cases of incomplete excision. However, as they are well-circumscribed, complete removal is not difficult to be done. In contrast, AA is ill-defined, infiltrates the surrounding tissues and presents a higher risk of recurrence (30–40%) [6–10]. We have enumerated in Table 1 the criteria of differential diagnosis between AMF, CA and AA [1–4, 6, 9–13].

Although a benign tumour, AA may aggressively infiltrate adjacent structures [7]. In AA without nuclear atypia and/or mitotic figures and low Ki67 index, the AA is diagnosed based on the infiltrative growth features that are absent in AMF. However, the cellular AMF is difficult to be differentiated from AA [8]. In the present case, stroma presented myxoid foci but well-defined margins and absence of recurrences allowed the diagnosis of AMF. As AMF may co-exist with AA, the correct diagnosis is sometimes established after recurrences only [8].

Differential diagnosis of AMF also includes superficial angiomyxoma, spindle cell lipoma and solitary fibrous tumour. In superficial angiomyxoma, the inflammatory cells represented mostly by neutrophils and infrequent embedded epithelial components are indicators of the diagnosis. In spindle cell lipoma, the adipose tissue is embedded epithelial components are indicators of the diagnosis. In spindle cell lipoma, the adipose tissue is

The authors declare no conflict of interest.

References

1. Fletcher CD, Tsang WY, Fisher C, et al. Angiomyofibroblasto-

oma of the vulva. A benign neoplasm distinct from aggressive

angiomyxoma. Am J Surg Pathol 1992; 16: 373-82.

2. Cheng L, Bostwick DG. Essentials of Anatomic Pathology. 4th ed. Springer 2016; 1083-4, 1466-7.

3. Wolf B, Horn LC, Handzel R, Einenkel J. Ultrasound plays a key role in management of genital angiomyofibrolas-
toma: a case report. Exp Ther Med 2016; 11: 1893-5.

4. Zhang W, Jin MS, Zou YB, et al. Diagnostic significance of

DOG-1 and PKC-θ expression and c-Kit/PDGFRα mutations in gastrointestinal stromal tumours. Scand J Gastroenterol 2013; 48: 1055-65.

5. Schoolmeester JK, Fritchie KJ. Review of genital soft tissue

tumors. J Cutan Pathol 2015; 42: 441-51.

6. Yu G, Kong L, Qu G, et al. Intrapelvic aggressive angiomy-

xoma with inferior vena cava involved. Int J Clin Exp Pathol 2016; 9: 4088-91.

7. Wang YF, Qian HL, Jin HM. Local recurrent vaginal aggressive angiomyxoma misdiagnosed as cellular angiomyofibrolas-
toma: a case report. Exp Ther Med 2016; 9: 1189-3.

8. Flucke U, van Krieken JH, Mentzel T. Cellular angiomyxoma: a diagnostic issue. Adv Ther 2016; 25: 82-9.

9. Qiu P, Wang Z, Li Y, Cui G. Giant pelvic angiomyofibrolas-
toma: a case report and literature review. Diagn Pathol 2014; 9: 106.
11. Hsu C, Fang C, Chien C, et al. The first case of synchronous cellular angiofibromas of the scrotum. Urol Sci 2016; 27: 114-6.

12. Matsukuma S, Koga A, Suematsu R, et al. Lipomatous angiofibroblastoma of the vulva. A case report and review of the literature. Mol Clin Oncol 2017; 6: 83-7.

13. Creytens D. Cellular angiofibroma with sarcomatous transformation showing pleomorphic liposarcoma-like and atypical lipomatous tumor-like features. Am J Dermatopathol 2016; 38: 712-4.

14. McCluggage WG, Jamieson T, Dobbs SP, Grey A. Aggressive angiomyxoma of the vulva: dramatic response to gonadotropin-releasing hormone agonist therapy. Gynecol Oncol 2006; 100: 623-5.

15. Lee HE, Kim MA, Lee HS, et al. Characteristics of KIT-negative gastrointestinal stromal tumours and diagnostic utility of protein kinase C theta immunostaining. J Clin Pathol 2008; 61: 722-9.