Case Reports in Oncology

Case Rep Oncol 2019;12:364–369

DOI: 10.1159/000500504
Published online: May 16, 2019

Case Report

Spontaneous Regression of Myxofibrosarcoma of the Thigh after Open Biopsy

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Keywords
Myxofibrosarcoma · Biopsy · Spontaneous regression

Abstract
Spontaneous regression of sarcoma is exceedingly rare. A 62-year-old male presented with myxofibrosarcoma of the thigh which regressed after open biopsy. Treatment strategy for this condition is not well-documented in the literature. In this report, we describe the case of a spontaneously regressed myxofibrosarcoma successfully treated by resection where the extent of the tumor was determined from the initial MRI. This case demonstrates that myxofibrosarcoma has the potential to regress spontaneously, and astute awareness of this phenomenon is necessary for appropriate management of this condition.

Introduction

Unexpected regression of cancer is a well-known phenomenon, albeit rare. Spontaneous regression of cancer has been defined as partial or complete disappearance of a malignant tumor without any kind of treatment [1]. Carcinomas account for majority of spontaneous regression reported to date but encountering such phenomenon in sarcomas is extremely rare. Although various mechanism of the remission has been reported to date, little is known

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behind this rare phenomenon. In this report, we present a rare case of spontaneous regression of myxofibrosarcoma associated with an open biopsy, with a review of the literature.

Case Report

A 62-year-old man was referred to our clinic with a gradually enlarging mass from one year ago in his right thigh. On physical examination, there was a 10 cm non-tender mass on his anterior thigh. The overlying skin was taut and adherent with slight hotness. On X-ray, there was no obvious calcification or scalloping of the femur. MRI revealed an elongated 8.6 × 13.3 × 1.9 cm bland mass which showed low intensity on T1WI and high intensity on T2WI with a tail like sign in the subcutaneous tissue. Gadolinium administration showed uniform enhancement of the tumor without any peripheral inflammation or edema (Fig. 1). The laboratory data including white blood cells, neutrophils, and C-reactive protein were all in the normal range. On positron emission tomography – computed tomography (PET – CT), there was no accumulation of ^{18}F – FDG besides the thigh. Differential diagnosis included benign lesion such as a nodular fasciitis and malignant tumors such as myxofibrosarcoma and undifferentiated pleomorphic sarcoma; therefore, an open biopsy was performed. On histological examination, the lesion was composed of spindle and pleomorphic tumor cells with atypical nuclei admixed with myxoid stroma (Fig. 2). On immunohistochemistry, the lesion was positive for vimentin, CD34 and Ki67 (21.5%), suggestive of myxofibrosarcoma. During the preoperative period for wide resection, repeat MRI was performed to assess the extent of the hemorrhage 21 days after the open biopsy. Although the pattern of signal intensities was the same, there was a significant decrease in size from 8.6 × 13.3 × 1.9 to 6.0 × 8.5 × 0.9 cm. Since we didn't perform any medical treatments other than open biopsy, we determined it to be a spontaneous regression of the tumor; however, due to the unpredictable nature of the phenomenon, wide resection with skin graft was performed. At the time of the surgery 34 days after the open biopsy, the tumor has regressed even further where it was difficult to palpate the mass. Margin of resection was determined from the MRI of the initial onset, 3 cm from the edge of the tumor. On gross examination, resected specimen was tan white residing in the subcutaneous tissue measuring 3.7 × 2.5 × 1.2 cm. Histologically, over 95% of the residual lesion was composed of prominent fibrosis and granulation with myxomatous change by hematoxylin and eosin (HE) staining. There were abundant foamy cells, lymphocytes and plasma cell proliferation around small vessels, and sporadic atypical cells, most likely degenerated tumor cells, were present in a very small part of the lesion (Fig. 3). Immunohistochemically, CD68, vimentin and Ki67 (5.4%) were positive. Based on these histological and radiographic findings, spontaneous regression of myxofibrosarcoma was chosen as the final diagnosis. The postoperative period was uneventful, and at the final follow-up after one year postoperatively, no local recurrence or metastasis has been observed.

Discussion

Myxofibrosarcoma is a subtype of soft tissue sarcoma characterized by its infiltrative growth often seen in elderly patients. It was first described in 1977 as a myxoid variant of malignant fibrous histiocytoma [2], and subsequently, World Health Organization reclassified the entity as a distinct tumor in light of histological and immunohistochemical findings in 2002. It has a predilection to occur in the lower extremity of a male and is considered a rare

tumor representing approximately 5% of all soft tissue tumor diagnosis. Surgical resection is recommended for myxofibrosarcoma due to its insensitivity to chemotherapy and radiation. Although the prognosis of myxofibrosarcoma is relatively good with a 5-year survival rate reported to be approximately 60%, it has a propensity to recur locally [3].

Spontaneous regression of cancer has been reported to occur at a frequency of approximately 1 in 60,000–100,000 [4]. It has been postulated that the frequency of natural regression of cancer may differ depending on race and histology. Reported number of spontaneous regressions varies widely depending on the type of cancer, with large number of reports in renal cell cancer, malignant melanoma and lymphoma [5]. Although the mechanism behind spontaneous regression is unknown, it has been hypothesized as due to influence of hormone, involvement of immune modulation, trauma, blood flow disorder, infection and emergence of paraneoplastic syndrome [6, 7]. Among the various possibilities, enhancement of the immune system has been suggested to play an important role in both the progression and regression of cancers. Our pathological results showing multiple invasion of lymphocytes, neutrophils and plasma cells also suggest the presence of some kinds of immunologic response. According to Jessy 's report, by accelerating the immune system, antigen presenting cells such as dendritic cells are activated, thereby increasing the recognition of cancer cells and pathogens. Furthermore, lymphocytes and NK cells efficiently approach cancer cells due to hyperpermeability to cancer cells which leads to spontaneous regression of cancer [6]. The cause of acceleration of the immune system is thought to be various, and in our case, open biopsy seems to be the only cause that could have triggered this phenomenon.

It is difficult to predict the frequency of spontaneous regression in sarcomas. In Challis's report, among the 504 cases with spontaneous regressions in malignant tumor, only 5 cases were sarcomas [5]. To date, there have been 17 reports of spontaneous regression of sarcomas: 4 osteosarcomas, 4 angiosarcomas, 2 fibrosarcomas, 2 leiomyosarcomas, and one each in alveolar soft tissue sarcoma, endometrial stromal sarcoma, synovial sarcoma, extraskeletal myxoid chondrosarcoma and myxofibrosarcoma [8–14]. Of the 17 cases, 10 regressions occurred in the metastatic site, and 7 in the primary lesion. Complete disappearance of the tumor was reported in 4 metastases and 3 primary lesions.

The treatment strategy is controversial regarding spontaneously regressed cases of the primary lesion. Of the seven cases in whom regression of the primary tumor was observed, 4 cases were treated by surgery and 3 cases were followed up with strict observation. Surgery was withheld from 3 cases due to multiple distant metastases in one case and patient requests in 2 cases. In 2 out of 4 cases where surgery was selected, it was because of regrowth after spontaneous regression. Furthermore, according to Cole, only 22 out of the 176 cancer regressions lasted for more than 10 years, and majority of the patients succumbed to their disease after partially or temporally suspended tumor growth [15]. Although common factors in these cases are difficult to ascertain given the limited number and various histology, re-growth and metastasis are often seen after spontaneous regression; therefore, implementing surgical resection with adequate margin and standard follow-up protocol for each histologically different sarcoma should be considered to ensure cure. Because there was no distant metastasis in our case, wide resection was performed for a definitive treatment. The extent of the resection margin is controversial especially in regressed cases, but due to its uncertain nature, we determined the margin with reference to the maximum diameter of the tumor from the initial MRI.

In conclusion, a rare spontaneous regression of myxofibrosarcoma in the thigh was observed in a 62-year-old male. Although there has been no local recurrence after wide

resection, the rarity of this phenomenon has not enabled the prediction of the outcome, therefore further follow-up is warranted.

Statement of Ethics

The authors have no ethical conflicts to disclose. Informed consent was obtained from the patient for this case report and any accompanying images.

Disclosure Statement

The authors have no conflicts of interest to declare.

References

1 Cole WH, Everson TC. Spontaneous regression of cancer: preliminary report. Ann Surg. 1956 Sep;144(3):366–83.
2 Weiss SW, Enzinger FM. Myxoid variant of malignant fibrous histiocytoma. Cancer. 1977 Apr;39(4):1672–85.
3 Dewan V, Darbyshire A, Sumathi V, Jeys L, Grimer R. Prognostic and survival factors in myxofibrosarcomas. Sarcoma. 2012;2012:830879.
4 Cole WH. Efforts to explain spontaneous regression of cancer. J Surg Oncol. 1981;17(3):201–9.
5 Challis GB, Stam HJ. The spontaneous regression of cancer. A review of cases from 1900 to 1987. Acta Oncol. 1990;29(5):545–50.
6 Jessy T. Immunity over inability: the spontaneous regression of cancer. J Nat Sci Biol Med. 2011 Jan;2(1):43–9.
7 Hori S, Tachihara M, Tamura D, Kobayashi K, Nakata K, Kamiryo H, et al. Spontaneous Regression of Epithelioid Angiosarcoma in a Young Woman. Intern Med. 2017 Dec;56(24):3333–9.
8 Suzuki M, Matsuzuka T, Ikeda M, Nakaegawa Y, Kobayashi T, Kawase T, et al. Spontaneous regression of chemotherapy-resistant metastases from a scalp angiosarcoma. Fukushima J Med Sci. 2017 Aug;63(2):106–11.
9 Matsuo T, Shimose S, Kubo T, Mikami Y, Arihiro K, Yasunaga Y, et al. Extraskeletal osteosarcoma with partial spontaneous regression. Anticancer Res. 2009 Dec;29(12):5197–201.
10 BaniHani MN, Al Manasra AR. Spontaneous regression in alveolar soft part sarcoma: case report and literature review. World J Surg Oncol. 2009 Jun;7(1):53.
11 Tsunezuka H, Miyata N, Furuya T, Konishi E, Inoue M. Spontaneous Regression of Primary Pulmonary Synovial Sarcoma. Ann Thorac Surg. 2018 Mar;105(3):e129–31.
12 Kinoshita T, Kamiyama I, Hayashi Y, Asakura K, Ohtsuka T, Kohno M, et al. Spontaneous Regression of Metastatic Extraskeletal Myxoid Chondrosarcoma. Ann Thorac Surg. 2015 Oct;100(4):1465–7.
13 Sait SF, Danzer E, Ramirez D, LaQuaglia MP, Paul M. Spontaneous Regression in a Patient With Infantile Fibrosarcoma. J Pediatr Hematol Oncol. 2018 May;40(4):e253–5.
14 Sakamoto A, Shiba E, Hisaoka M. Short-term spontaneous regression of myxofibrosarcoma in the scapular region. Skeletal Radiol. 2014 Oct;43(10):1487–90.
15 Cole WH. Spontaneous regression of cancer: the metabolic triumph of the host? Ann N Y Acad Sci. 1974;230(1):111–41.

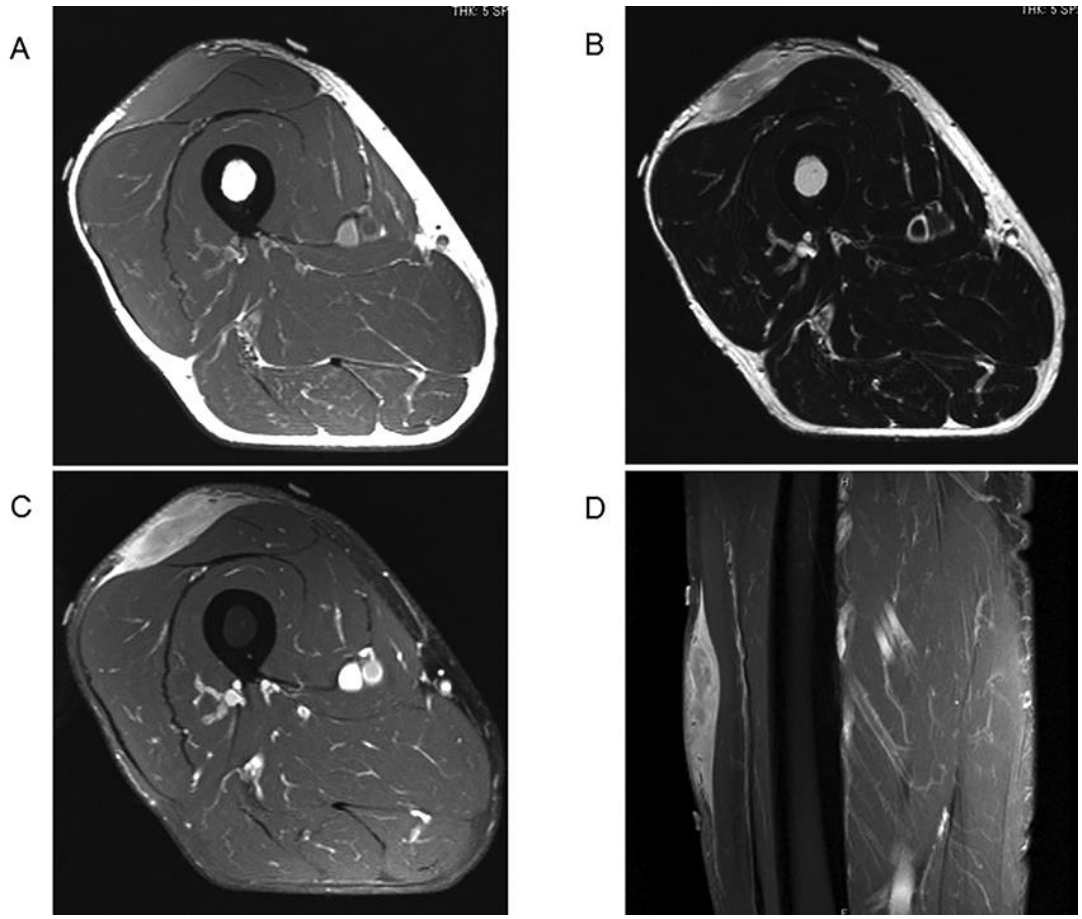

Fig. 1. On MRI, the tumor is 8.6 × 13.3 cm in size and resides in the anterior thigh. The lesion is low intensity on T1WI (**A**) and high intensity on T2WI (**B**). Gadolinium-contrast administration showed enhancement of the lesion (**C**, **D**).

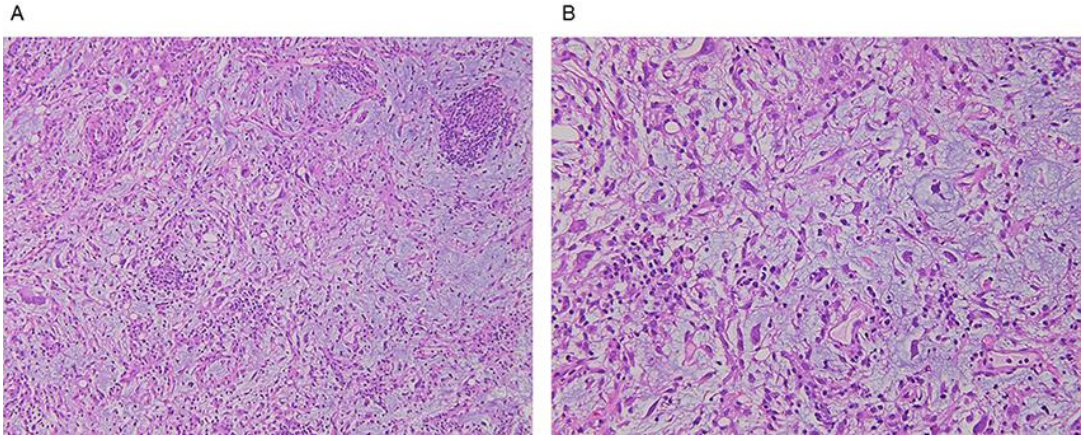

Fig. 2. Histological findings from the biopsy specimen. Photomicrograph of HE staining demonstrates proliferation of atypical spindle cells in a myxomatous background (magnification × 100) (**A**). Nuclear atypia and mitoses are prevalent on higher powered HE image (magnification × 200) (**B**).

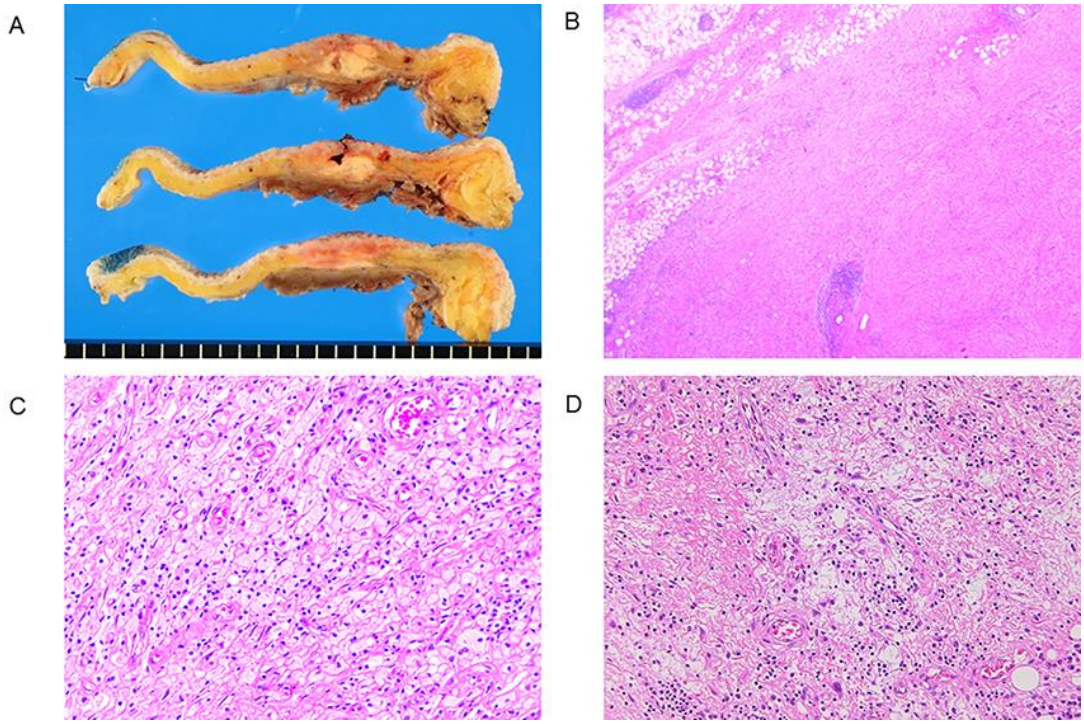

Fig. 3. (**A**) The lesion, measuring 3.7 × 2.5 × 1.2 cm, was tan white residing in the subcutaneous tissue. (**B**) Histological picture of the border between the white residual lesion and normal fat tissue. Normal fat cells reside on the left of the residual lesion. HE staining showed that the residual lesion was composed of fibrosis and granulation tissue with myxomatous change (magnification ×20). Majority of the lesion was composed of abundant foamy cells and lymphocytes (**C**: magnification ×200), and sporadic atypical cells were observed in a very small part of the lesion (**D**: magnification ×200).