



Rapid progression of a pregnancy-associated intra-abdominal desmoid tumor in the post-partum period: A case report

David Hanna^a, Michail Magarakis^b, William S. Twaddell^c, H. Richard Alexander^d, Susan B. Kesmodel^{d,*}

^a University of Maryland School of Medicine, 655 W. Baltimore Street, Baltimore, MD 21201, United States

^b Department of Surgery, University of Maryland School of Medicine, Baltimore, MD 21201, United States

^c Department of Pathology, University of Maryland School of Medicine, Baltimore, MD 21201, United States

^d Department of Surgery, Division of General and Oncologic Surgery, University of Maryland School of Medicine, Baltimore, MD 21201, United States

ARTICLE INFO

Article history:

Received 12 July 2016

Received in revised form 23 October 2016

Accepted 24 October 2016

Available online 26 October 2016

Keywords:

Intra-abdominal desmoid tumor

Pregnancy-associated desmoid

Post-partum desmoid

Desmoid rapid progression

Soft tissue tumor

ABSTRACT

INTRODUCTION: The clinical behavior of desmoid tumors can be unpredictable, particularly when they arise in the ante-partum or post-partum period. We present a case of an intra-abdominal desmoid tumor that was identified in the ante-partum period, progressed rapidly in the post-partum period, and was subsequently resected.

PRESENTATION OF CASE: The patient is a 19 year-old female who was found to have a 12 cm intra-abdominal mass on a fetal assessment ultrasound. The decision was made to observe the patient and monitor the mass for growth. However, the mass rapidly grew in the post-partum period. The patient was transferred to our institution after an exploratory laparotomy revealed a large intra-abdominal mass emanating from the small bowel mesentery. The 30 cm × 24 cm × 16 cm mass was successfully resected with negative margins, and the pathologic diagnosis of desmoid tumor was confirmed. The patient had an uncomplicated post-operative course and was discharged on post-operative day 6.

DISCUSSION: The majority of pregnancy-associated desmoid tumors are in the abdominal wall, arising from the rectus abdominus muscle or from previous Cesarean section scars. These tumors may spontaneously regress in the post-partum period and therefore, patients with these tumors are often observed. Close follow-up is important so that rapid tumor progression, which may lead to unresectability, can be identified and managed appropriately.

CONCLUSION: A patient with a rare case of a giant pregnancy-associated, intra-abdominal desmoid tumor that rapidly progressed in the post-partum period and was successfully treated with surgical resection with negative margins.

© 2016 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Desmoid tumors are rare benign tumors exhibiting fibroblastic proliferation that typically arise from fascial or musculo-aponeurotic structures [1]. They account for 0.03% of all documented neoplasms and approximately 3% of all soft tissue tumors, with an incidence of 2–4 per million per year [2]. These tumors have a propensity to infiltrate surrounding structures, rather than metastasize, and have the potential to cause significant

morbidity and mortality due to pressure effects and obstruction of vital organs. According to consensus-based guidelines from the National Comprehensive Cancer Network (NCCN), surgical resection should be attempted if technically feasible in symptomatic patients or in patients with tumors that pose imminent risk to surrounding structures [3]. However, the clinical progression and behavior of these tumors can be unpredictable, particularly when they occur in the ante-partum or post-partum period in women.

We present a case of a giant intra-abdominal desmoid tumor that rapidly progressed in the post-partum period and was successfully resected.

2. Presentation of case

The patient is a 19 year old female who was found to have an intra-abdominal mass that measured 12 cm in greatest dimension during a fetal assessment ultrasound which was performed at 34

* Corresponding author at: Department of Surgery, Division of General and Oncologic Surgery, University of Maryland School of Medicine, 29 S. Greene St., Rm GS609B, Baltimore, MD 21201, United States.

E-mail addresses: David.Hanna@som.umaryland.edu (D. Hanna), mmagarakis@smail.umaryland.edu (M. Magarakis), wtwaddell@umm.edu (W.S. Twaddell), HRAlexander@smail.umaryland.edu (H.R. Alexander), skesmodel@smail.umaryland.edu (S.B. Kesmodel).

weeks gestation. The patient was asymptomatic and the decision was made to proceed with observation. The patient had a successful spontaneous vaginal delivery without complications in December 2015. In the first post-partum week, the patient continued to report shortness of breath and abdominal pressure. A computed tomography (CT) scan was performed on December 31, 2015 which showed that the mass measured 14 cm × 13 cm × 13 cm and appeared to be attached to the uterus, suggestive of an exophytic fibroid. Again the decision was made to continue with observation.

Over the next 3 months, the patient's abdominal girth continued to increase. A follow-up MRI on April 1, 2016 showed that the mass had increased significantly in size, measuring 23 cm × 22 cm × 13 cm, and was potentially consistent with a desmoid tumor. The patient's only symptoms were increasing shortness of breath and abdominal pressure; she did not experience any change in bowel habits. The patient had no prior medical history or surgical history, and no family history of a similar condition, colorectal cancer, or familial adenomatous polyposis (FAP).

The patient was transferred to our institution with a negative pressure abdominal wound dressing on the evening of May 13, 2016 immediately after exploratory laparotomy at an outside hospital revealed a normal uterus and ovaries and a large intra-abdominal mass that was emanating from the small bowel mesentery. A CT angiogram of the abdomen and pelvis was performed to evaluate the vascular distribution to the mass and the small bowel. This showed a large mass filling the entire abdomen and displacing the bowel with a vascular supply from the superior mesenteric artery (SMA) (Fig. 1A–C). The proximal branches of the SMA supplying the small bowel and colon appeared to be separate from the mass.

The patient was taken to the operating room for surgical exploration. This demonstrated that the mass originated from the distal small bowel mesentery and a loop of small bowel was adherent to and inseparable from the mass (Fig. 2A). The small bowel was examined and it appeared that the patient would have sufficient small bowel remaining after resection. The mass was successfully resected en bloc with part of the ileum. A small portion of the terminal ileum, the ileocecal valve, and the middle colic artery and vascular supply to the proximal small bowel were preserved. The mass measured 30 cm × 24 cm × 16 cm (Fig. 2B). Pathology confirmed the diagnosis of desmoid tumor with negative surgical margins. (Fig. 3) The tumor was negative for estrogen and progesterone receptor. The patient had an uncomplicated post-operative course and was discharged on post-operative day 6.

On multidisciplinary review of the patient's case, adjuvant radiation therapy was not recommended due to the documented negative margins and tumor location [3]. The patient had no complaints at a 3-month follow-up clinic visit, and upper and lower endoscopic studies done at that time showed no evidence of polyps. Per NCCN guidelines, the patient will be followed with history, physical exam and imaging every 6 months for 2 years [3].

3. Discussion

Desmoid tumors are rare tumors that can occur anywhere in the body and have quite variable clinical behavior. The majority of desmoid tumors arise sporadically, while 5–15% are associated with familial adenomatous polyposis (FAP) [4,5]. Up to 20% of patients with FAP will develop a desmoid tumor, most which occur intra-abdominally or in the abdominal wall and arise at the site of prior surgical anastomoses or incisions. Sporadic desmoid tumors are more commonly located in the abdominal wall or at extra-abdominal locations, have a lower mortality rate than those associated with FAP, and have a higher rate of spontaneous regression [4,6]. Small retrospective studies have shown spontaneous regression rates of up to 29% in patients with sporadic desmoid



Fig. 1. (A–C): CT angiogram of abdomen and pelvis demonstrating a large intra-abdominal mass with vascular supply from the superior mesenteric artery.



Fig. 2. (A) Intra-operative view of intra-abdominal desmoid tumor with adherent portion of small bowel. (B) Desmoid tumor after surgical resection.

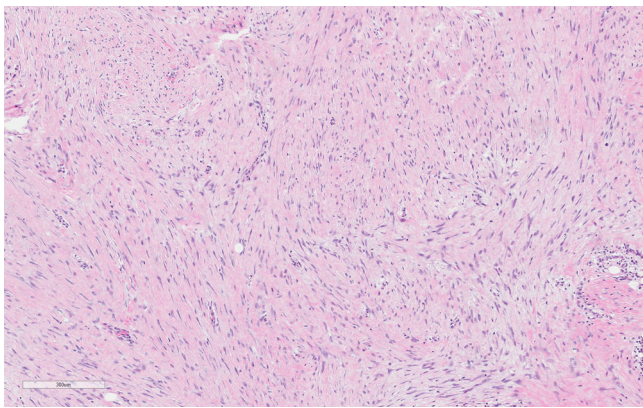


Fig. 3. The tumor consists of bland spindle cells with abundant fibrotic stroma. There is minimal mitotic activity (Hematoxylin & Eosin Stain, bar = 300 μm).

tumors and 5-year progression-free survival rates of 50% in patients initially managed with observation [7,8].

Although the molecular events surrounding tumor formation are not completely understood, dysregulation of the Wnt signaling pathway, leading to accumulation of beta-catenin and fibroblast proliferation, appears to play a role in the development of both sporadic and FAP-associated desmoid tumors [9]. Hormonal factors

may also play a role in the development of pregnancy-associated desmoid tumors. This hypothesis is supported by reports that patients may respond to anti-estrogen therapy and that spontaneous regression of pregnancy-associated desmoid tumors may occur post-partum [10]. The vast majority of these tumors are in the abdominal wall, arising from the rectus abdominus muscle or from previous Cesarean section scars, while intra-abdominal tumors are rare [11]. Therefore, patients who develop pregnancy-associated desmoid tumors may often be observed rather than having surgical intervention. This approach was initially utilized in our patient, however, due to rapid growth of her tumor, surgical resection was eventually required.

The management of patients with desmoid tumors is controversial for several reasons. While some desmoid tumors can be locally aggressive and infiltrate surrounding tissues, others have a very indolent course. Although the majority of patients with desmoid tumors become symptomatic, the mortality rate is low [12]. Additionally, desmoid tumors are rare and this makes it difficult for investigators to study different treatment approaches.

In the past, surgical resection was considered the mainstay of treatment for both extra-abdominal and intra-abdominal desmoid tumors. However, more groups are now adopting a “wait and see” approach given the significant variability in clinical behavior [9,13]. In cases where resection is necessary, the surgical approach should balance complete tumor removal while minimizing functional and

aesthetic morbidity. There is controversy regarding the impact of microscopically positive margins on local recurrence [12,14,15]. Thus, microscopically positive margins are acceptable in cases where achieving negative margins would dramatically increase operative morbidity.

Multimodal therapy for desmoid tumors may involve adjuvant radiotherapy as well as neoadjuvant and adjuvant systemic therapies. Radiation therapy is an effective therapeutic option for patients with unresectable tumors or for patients who are not good surgical candidates. It may also improve local control rates and may be particularly helpful in patients with microscopically positive surgical margins [16]. Systemic therapy is typically utilized in patients with multiple local recurrences or where surgical resection would lead to significant morbidity and mortality [1]. It may also be used preoperatively to improve surgical outcomes. Several small studies have also shown that anti-estrogen and non-steroidal anti-inflammatory agents may be effective in halting disease progression [17,18].

4. Conclusion

Desmoid tumors are rare neoplastic tumors of fibroblastic proliferation that pose several management challenges due to the low incidence, variable disease progression, and lack of randomized clinical trials investigating treatment approaches. We present a rare case of a giant pregnancy-associated intra-abdominal desmoid tumor that demonstrated rapid progression in the post-partum period. The patient was successfully treated with surgical resection with negative margins. Spontaneous regression of desmoid tumors is possible in the post-partum period and observation has been adopted at many institutions. Nonetheless, it is critical to closely monitor these patients with clinical exam and imaging in this period so that appropriate interventions can be instituted when signs and symptoms of tumor progression develop.

Conflicts of interest

The authors declare no conflicts of interest.

Funding

This research received no funding.

Ethical approval

N/A.

Consent

Written informed consent was obtained from the patient for publication of this report and accompanying images.

Author contribution

The project idea and surgical intervention were led by Dr. Susan Kesmodel, Dr. H. Richard Alexander, and Dr. Michail Magarakis.

A literature review was carried out by David Hanna and Dr. Susan Kesmodel. The pathology review and histopathology slide were prepared by Dr. William S. Twaddell. The manuscript was prepared by David Hanna and Dr. Susan Kesmodel.

Guarantor

Susan Kesmodel.

References

- [1] C. Escobar, R. Munker, J. Thomas, B. Li, G. Burgon, Update on desmoid tumors, *Ann. Oncol.* 23 (2012) 562–569.
- [2] S. Devata, R. Chugh, Desmoid tumors: a comprehensive review of the evolving biology, unpredictable behavior, and myriad of management options, *Hematol. Oncol. Clin. North Am.* 5 (2013) 989–1005.
- [3] National Comprehensive Cancer Network (nccn) NCCN Clinical Practice Guidelines in Oncology: Soft Tissue Sarcoma (Ver. 2.2012). http://www.nccn.org/professionals/physician_gls/pdf/sarcoma.pdf (accessed 20.05.16).
- [4] M. Nieuwenhuis, M. Casparie, L. Mathus-Vliegen, O. Dekkers, P. Hogendoorn, H. Vasen, A nation-wide study comparing sporadic and familial adenomatous polyposis-related desmoid-type fibromatoses, *Int. J. Cancer* 129 (2011) 256–261.
- [5] L. Bertario, A. Russo, P. Sala, M. Eboli, M. Giarola, F. D'Amico, et al., Genotype and phenotype factors as determinants of desmoid tumors in patients with familial adenomatous polyposis, *Int. J. Cancer* 95 (2001) 102–107.
- [6] A. Crago, B. Denton, S. Salas, A. Dufresne, J. Mezhr, M. Hameed, et al., A prognostic nomogram for prediction of recurrence in desmoid fibromatosis, *Ann. Surg.* 258 (2013) 347–353.
- [7] S. Bonvalot, H. Edweny, V. Haddad, F. Rimareix, G. Missenard, O. Oberlin, et al., Spontaneous regression of primary abdominal wall desmoid tumors: more common than previously thought, *Ann. Surg. Oncol.* 20 (2013) 4096–4102.
- [8] M. Fiore, F. Rimareix, L. Mariani, J. Domont, P. Collini, C. Le Pechoux, et al., Desmoid-type fibromatosis: a front-line conservative approach to select patients for surgical treatment, *Ann. Surg. Oncol.* 16 (2009) 2587–2593.
- [9] A. Gronchi, C. Colombo, C. Le Pechoux, A. Dei Tos, A. Le Cse, A. Marrari, et al., Sporadic desmoid-type fibromatosis: a stepwise approach to a non-metastasising neoplasm – a position paper from the Italian and the French sarcoma group, *Ann. Oncol.* 25 (2013) 578–583.
- [10] M. Fiore, S. Coppola, A. Cannell, C. Colombo, M. Bertagnolli, S. George, et al., Desmoid-type fibromatosis and pregnancy: a multi-institutional analysis of recurrence and obstetric risk, *Ann. Surg.* 259 (2014) 973–978.
- [11] W. Robinson, M. Colette, A. Kendal, N. Pearlman, Desmoid tumors in pregnant and postpartum women, *Cancers* 4 (2012) 184–192.
- [12] D. Lev, D. Kotilingam, C. Wei, M. Ballo, G. Zagars, P. Pisters, et al., Optimizing treatment of desmoid tumors, *J. Clin. Oncol.* 25 (2007) 1785–1791.
- [13] S. Burtenshaw, A. Cannell, E. McAlister, S. Siddique, R. Kandel, M. Blackstein, et al., Toward observation as first-line management in abdominal desmoid tumors, *Ann. Surg. Oncol.* 23 (2016) 2212–2219.
- [14] J. Mullen, T. Delaney, W. Kobayashi, J. Szymonifka, B. Yeap, Y. Chen, et al., Desmoid tumor: analysis of prognostic factors and outcomes in a surgical series, *Ann. Surg. Oncol.* 19 (2012) 4028–4035.
- [15] N. Merchant, J. Lewis, J. Woodruff, D. Leung, M. Brennan, Extremity and trunk desmoid tumors: a multifactorial analysis of outcome, *Cancer* 15 (1999) 2045–2052.
- [16] J. Nuytens, P. Rust, C. Thomas Jr., A. Turrisi, Surgery versus radiation therapy for patients with aggressive fibromatosis or desmoid tumors: a comparative review of 22 articles, *Cancer* 88 (2000) 1517–1523.
- [17] A. Hansmann, C. Adolph, T. Vogel, A. Unger, G. Moeslein, High-dose tamoxifen and sulindac as first-line treatment for desmoid tumors, *Cancer* 100 (2004) 612–620.
- [18] D.R. Quast, R. Schneider, E. Burdzik, S. Hoppe, G. Moeslein, Long-term outcome of sporadic and FAP-associated desmoid tumors treated with high-dose selective estrogen receptor modulators and sulindac: a single-center long-term observational study in 134 patients, *Fam. Cancer* 15 (2016) 31–40.

Open Access

This article is published Open Access at sciendo.com. It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.